Combined

Report on

Evaluation of Rajiv Gandhi Grameen Vidyutikaran Yojana (RGGVY)

of

Rajasthan, Assam, Gujarat, Himachal Pradesh and Uttar Pradesh

Submitted to

Rural Electrification Corporation Limited

REC
Endless energy,Infinite possibilities

Prepared by

Integrated Research and Action for Development

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Integrated Executive Summary of RGGVY Evaluation of Rajasthan, Assam, Gujarat, Himachal Pradesh and Uttar Pradesh

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Rajiv Gandhi Grameen Vidyutikaran Yojana (RGGVY) Programme is a landmark initiative of the Government of India. The visible positive impact of the programme are (a) electricity supply for more than 6-8 hours in rural areas, (b) provides better opportunities in education, health, communication and economic development in the villages,(c)facilitated implementation of "National Electricity Policy" and "Rural Electrification Policy", (d) strengthening rural electrification system through franchisees (e) opened up opportunity for power generation from renewable energy resources and link it to the national grid. IRADe has conducted the evaluation of RGGVY in Rajasthan, Himachal Pradesh, Assam, Gujarat, and Uttar Pradesh. The details of the district surveyed are shown in the map (annexure-1). The integrated executive summary is the combined summary of the findings of each state and is based on surveyed data; information available, focus group discussion and various interactions with the stakeholders is as follows:

1) The Supply Hours of Electricity:

The avaibality of electricity on a daily basis vary from State to State, and also within the districts. It varies from 6hours to 24 hours. Himachal Pradesh (HP) and Gujarat (GJ) are providing nearly continuous power supply in rural areas. Electricity supply in Rajasthan and Assam is satisfactory. Jodhpur, Ajmer and Hanumangarh district of Rajasthan receive on an average 16-18 hours of supply per day. In Rajasthan, even though 16-18 hours of supply per day is made available, but only 0.5 to 2 hours of supply is provided during the evening (peak) hours. Similarly, evening hour supplies, (in the range of 0-2 hours) were observed in the surveyed villages of Uttar Pradesh and Assam. The electricity supply in Uttar Pradesh is in the range of 6 to 12 hours daily but is of poor quality. Supply constraint is the main barrier for less hours of supply in the power deficit states like UP and Assam. In Himachal Pradesh, HPSEB provides power supply for 16-22 hours per day, however the consumers report frequent network tripping and low voltages in remote households and in hamlets. On the other hand, Gujarat state supplies around 22-24 hours of electricity and is of good quality.

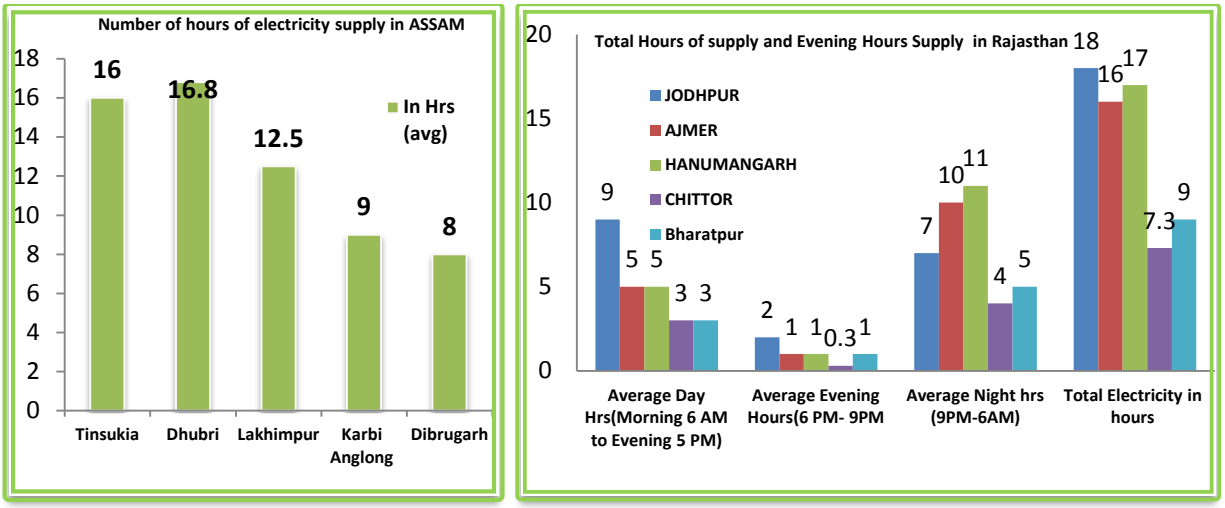


Figure 1 Hours of Supply in Assam and Rajasthan[1]

The good quality of supply in Gujarat is mainly due to segregation of agricultural feeder from other loads and the feeders receive 8 hours supply on a rotation basis. In lieu of problems being faced by consumers, particularly in the state of UP, Rajasthan, Assam, and Himachal Pradesh, consumers demanded: (a) Mandatory power supply of 2-3 hours during evening hours, (b) advance information regarding load shedding and supply schedule. *State governments must upgrade and strengthen the rural feeder with the twin objectives of achieving better quality and reliability of power supply; and to reduce technical losses in distribution system.* Since electricity supply to rural consumers is considered a loss making proposition for DISCOMs, there is a structural disincentive for the DISCOM to serve rural consumer particularly in a power deficit scenario. The adequate availability of electricity and of good quality is essential for long term sustainability of rural electrification. *To remove these structural disincentives, the central government may devise an appropriate mechanism by which they may supply unallocated power of NTPC and other cheap hydro power (power from cheap hydro power resources) at cheaper rates to the state government by emphasizing that this will be provided to the rural areas.* The Detailed mechanism can be devised in proper consultation with the stakeholders.

[1] Graphs for rest of the states are show in the Annexure 3

2) Village Electrification, BPL Households (HHs) and Public Places:

BPL connections have been released in phases; and access to electricity has been provided in public places located within the revenue village or within populated areas. Our **survey** results indicates that 45%, 57%, 51%, BPL Households (HHs) have been electrified in Assam, Rajasthan and UP, respectively. In Gujarat and Himachal Pradesh (HP) almost all the BPL households have been electrified in fact; in HP more number of BPL has been connected than the RGGVY target. Villages surveyed in Gujarat and of three districts of the HP, were partially/previously electrified and the focus was more on intensification and infrastructure augmentation. State governments have their own rural electrification schemes which complement and supplement the effort of RGGVY. Gujarat state had Jyoti Gram Yojana (JGY) and has Zupadpatti scheme which also provide BPL connections. Similar schemes exist in UP (Ambedkar village program where electrification is one of the component) and in Rajasthan (CM electricity for all Yojana). Delay in electrifying BPL HHs is mainly due to finalization of the eligible BPL list (which takes time as there are differences in the lists provided by Ministry of Rural Development and the State Government), migration of HHs, relocation and shifting of HHs in the villages and its physical identification of HHs in the villages, HHs living beyond 500 meters from the distribution transformer location, HHs living in the Non Abadi (outside main village clusters) areas.

Though small hamlets (less than 100 populations) are not covered under RGGVY, but they are being electrified in some cases in Rajasthan, as in Rajasthan almost all of the BPL families live in small hamlets in certain villages. The RGGVY Programme allocates Rs 2200 for giving free connection to BPL households, however this cost's norm needs revision as in some states costs are much higher. HP provides an additional amount of over Rs 2200/- for BPL connections, due to geographical reasons. *It is observed that large no of BPL HHs and rural population lives in small hamlets of less than 100 population, particularly in states like Rajasthan and Assam. Efforts must be made to electrify these households in 12th plan projects.* Since exact no. of HHs living in hamlets are not known, for 12th plan proper survey must be carried out in the context of current census, to know the exact number of hamlets and the HHs so as to have a proper design and implementation of the programme.

Access to electricity was/is available in public places but the electricity connection and energization was not availed of by all. In certain cases adequate access is not provided as it was observed schools are far away from the main village habitation. It was felt that laying line lines for schools (those are outside of the main village) may be prone to thefts and therefore lines were not laid till the school premises. The status of public place electrification in surveyed villages is indicated in Figure 2. In Rajasthan, Assam, UP, Himachal and Gujarat, there were 32, 20, 13, 18 and 40 public places in the surveyed villages respectively; of which 10, 4, 8, 15 and 40 places were energized respectively. *Initiatives by the state governments (through the Program and schemes) are the key to 100% energization of public places, as it is observed in Gujarat and Himachal.*

It was observed that authorities in control of Public Places in Assam and UP and to some extent in Rajasthan are not aware of the procedure of applying for electricity connection.

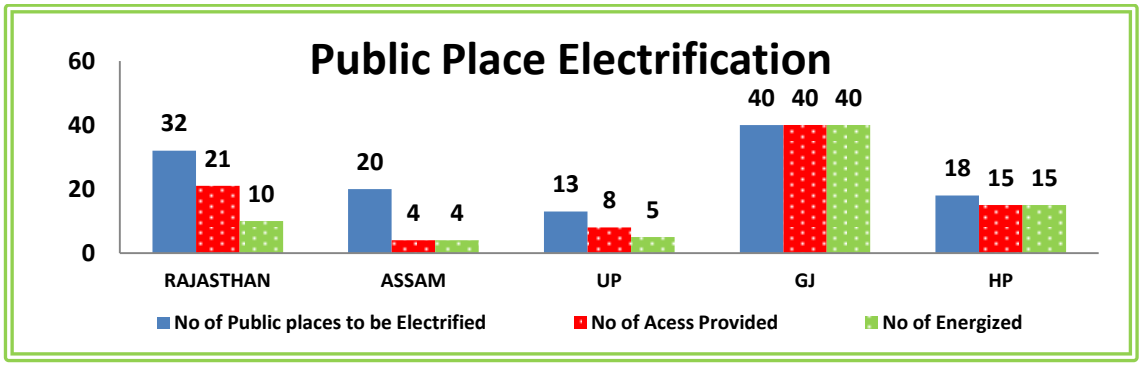


Figure 2: Status of Public Place electrification in numbers.

3) Extent of APL connections and VEI:

Proper consumer mix (BPL, APL, commercial, and agricultural) is essential to ensure revenue sustainability of rural electrification. Release of APL connection is a systematic process in Himachal Pradesh, Rajasthan, and Gujarat. In UP and Assam more focused effort is required by DISCOMs as a large number of APLs are still not connected. Sample Survey in Assam (Oct 2011) shows only 3.4% of APL Households were electrified, and large number of applications were pending. In Uttar Pradesh only two APL households were electrified out of total 1536 HHs surveyed in sample villages. During discussion with villagers, poor APL connections were attributed to poor quality of supply (intermittent and low voltage of supply), timely repair, restoration and maintenance of services, thereby APL's are not interested in applying for the new connection. APL consumers also expressed that free connection for BPL households is

provided whereas APL households has to pay for getting connected. Many APL households said that the disparity of income between APL and BPL is very less and therefore *they should also be issued connections in line with the BPL connections or at subsidized rates (similar to the Schemes in West Bengal).* In HP large proportions of APL HHs are electrified. Extent of APL electrification in Rajasthan is satisfactory; efforts are being made to release the APL connection within 2-3 months of receipt of applications and the lists of pending connections are put up on the website by Rajasthan DISCOMs.

In Gujarat all APL HHs are released connections within 30 days of application and cost of connection is based on load demand In Uttar Pradesh and ASSAM the release of APL connection is slow. In Assam, Rajasthan and UP, in most of the villages, *it was seen and reported that a good number of APL HHs have unauthorized connections through hooking. DISCOMs are reluctant to release more connections as they have to augment the transformer capacity in many cases, which is constrained by financial resources.*

- Most of the transformer capacity augmentation is also not proactive, it generally happens after transformers fail due to overloading.
- Camps are being organized in some states (Rajasthan, Gujarat) during process of handing over and taking over of the RGGVY-VEI. This practice should also be followed in other states as well.

It was observed that the appliances used by BPL and APL had cumulative load of 200-400watt and 500-1500 watt respectively. The range is indicated as it varies from state to state. Proactive and proper load assessment of the villages and HHs is needed for transformer capacity augmentation. The DISCOMs have fund constraints for transformer upgradation. *The REC may consider providing loans for transformer augmentations. The state governments should also provide funds for transformer augmentation as this help in reducing AT&C losses*. Further to improve efficiency of investments, Electricity Distribution Circles (EDC) should be empowered to decide on investment utilization, procurement and execution. *It is very essential that proactive efforts must be made to develop a proper consumer mix in villages particularly bringing productive loads in the rural areas (small scale commercial activities, agricultural load etc.) for the long term sustainability of rural electrification. The central government may give financial support for bringing productive loads in the RGGVY villages.*

4) Electricity Billing & revenue collection:

Billing and revenue collection processes have been streamlined in the states of Rajasthan, UP, Gujarat and HP, but efficiency varies. In Gujarat and HP almost 100% billing is being done and the villagers are regularly paying the bills, except in few tribal areas and for some habitual defaulters. In Rajasthan 80% villagers in the sampled survey receive bills bimonthly. Only 65% of Households had been making payments regularly. In Assam the surveyed villages were mostly electrified within last one year and about 47% households were receiving bills. It was encouraging to see 100% recovery of the bills issued to HHs holds in Assam. In UP most of the bills raised were based on average billing. It was seen that 30-40% of meters were not working, and were installed in inaccessible locations. Further, billing on an average basis creates unnecessary controversy. In all the states except Gujarat, it was found; DISCOMS take long time (2-6 Months) for issuing the first bill after the new connection due to consumer indexing. *Because of the delay, first aggregate bill is large, in the range of 1000-1500 rupees, which is difficult for Rural Household to pay in one go. This leads to a continued high level of outstanding bills including fine, thereby increasing risk of disconnections.*

Consumer indexing and automatic meter reading could be introduced to rural consumers. Meter reading based billing is a must to attract APL connection. There are certain villages where BPL do not pay bills as they think electricity is free for them. Message to BPL HHs need to be sensitized that connections are free but electricity usage has to be paid for. Meter defects should be attended without delay. Problems of theft and payment defaults need to be tackled effectively by having a effective vigilance group. To improve quality of billing and theft control, low cost prepaid meters may be installed in villages through pilot projects in 12th plan, and should be taken in mass scale if results are satisfactory.

5) Instances of Disconnections:

In surveyed villages 16, 13 and 10 cases of disconnections were observed in the states of Rajasthan, UP and Gujarat respectively. In Assam and HP no disconnections were reported. In Assam, villages were newly electrified and case of default in payment did not arise. In HP, HPSEB executives mentioned that 0.5% disconnections occurs. Reasons for disconnection are power theft (Meter bypassing), default in payment, houses getting damaged and migration of

population. *The risk of disconnection will be higher in future due to high outstanding bills and theft. The issue of releasing first bill must be systematized as in some cases issuing first bil took 2-6 months.* It is desirable to involve the Gram Panchayats and Law & Order machinery to do *away with power theft in the villages. Gujarat state has effective vigilance wing to help DISCOM* in maintaining consumer discipline and theft control.

6) Socioeconomic impact of RGGVY:

Contribution of rural economy to national GDP is gradually shrinking, but the socioeconomic impact of the rural revenue and income cannot be discounted. During the survey in all the states the consumers claimed that (a) their standard of living has improved, (b) the place is more secure, (c) women can work inside the house during evening hours on household chores, thus freeing them for more productive work on the field during the day. But in surveyed villages (in Rajasthan) only 2 % felt an **increase in employment opportunities** and 15 % villagers felt **increases in income** due to electricity (as they were using electricity in activities like weaving, tailoring, running kirana shops). More positive impacts were noticed in un-electrified villages than in partially electrified villages.

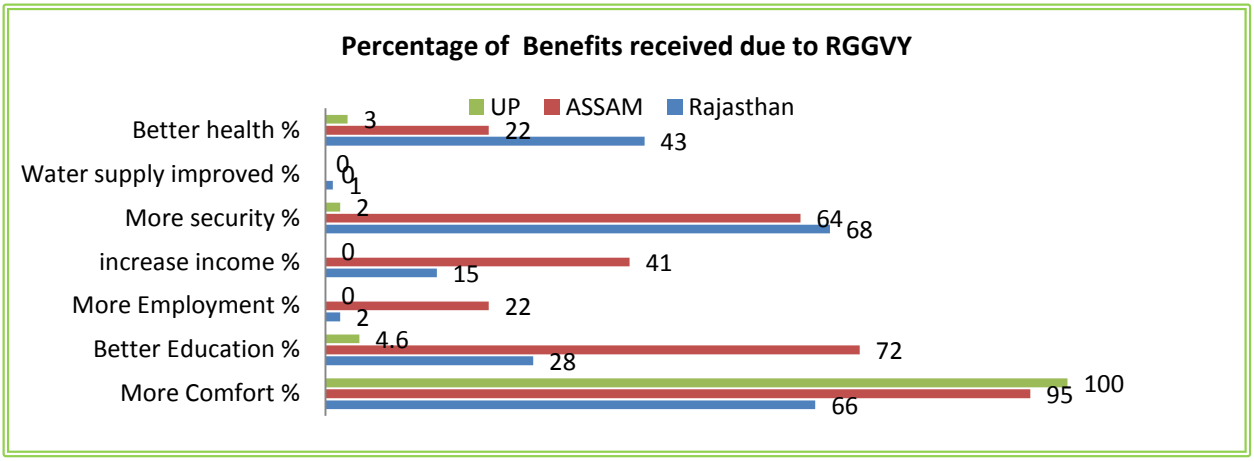


Figure 3 Socio-economic impact of RGGVY

In UP, poor and inadequate supply of electricity has resulted in very little positive socioeconomic impact. In fact during the surveys villagers reported that no benefits can be received with such poor supply. In Assam 100% increase in comfort, education and securities were felt by the villagers across the districts surveyed, although the supply was in the range of 8-16 hours. Sense of security has improved substantially in rural areas because of better illumination, thus respite from insects/snake bites and animals in most of the villages. *On*

being asked about need of street lights, women in all the states said there should/must be few street lights deployed in the villages as a part of the programme which will immensely improve the security during night hours. Rural electrifications had made good progress in Gujarat and HP, has huge positive impacts across various socio-economic indicators, But it is yet to generate visible employment opportunities and additional economic developments in rural areas. The quality of health service in the state has improved in Rajasthan, Gujarat, and HP. *Despite positive impacts it is observed that the current level of electrification is not enough to induce overall economic development in the villages, as envisaged in the National electrification policy.* State Governments should create appropriate linkage and coordination between Agriculture/food and utilities so that DISCOMs/EDCs could help in the growth and development of Agro and food processing and other village level enterprises. This will help in economic development and moving away from subsidies and cross-subsidization of electricity. More sustained efforts are required to draw the benefit of rural electrification *and factors such as quality and reliability of supply and the overall distribution governance must be improved substantially*.

7) Availability of Grid network & backward linkages:

Rajasthan, Himachal and Gujarat State governments have taken their own initiatives along with RGGVY to strengthen the distribution infrastructure, augment the rural REDBs and VEI, and provide BPL connections. Assam and Uttar Pradesh need a more concerted effort to augment rural network, though UP has a special scheme for Dalit Basti. In HP the projects in three districts are of retrofitting; VEI needs to be upgraded with higher capacity of DT or planned with HVDS design for rural area. In Assam 15 blocks out of 25 blocks have substation. In UP, RGGVY infrastructure in two villages was found to be damaged and one was partially damaged. Augmentation of network in Rajasthan is regularly being done due to the complementary schemes run by the State government. Under GPVVY (Gram Panchayat Vidyut Vitarana Yojana), 800 new 33Kv GSS are being built for a cluster of Panchayats and separate 11Kv feeder line is being laid for each Panchayat in Rajasthan.

R-APDRP may be extended to rural/semi rural areas in a phased manner. This will facilitate the creation of an efficient Distribution Management System with the balancing of Urban and Rural Load. R-APDRP will facilitate RGGVY program implementation by (a) online

monitoring of technical parameter in rural areas, (b) project management will be in line with organization setup of the utility, (c) Energy pooling can be done at the micro level. Since a large number of 33/11 KV Substations and DT's are being installed under RGGVY program, they should be provided with smart meters to link with R-APDRP systems.

Looking at the future load growths in rural India, there is a massive need for proactive augmentation and strengthening of overloaded system. State governments must develop a separate business plan for each distribution circle (may be drawn from the existing Rural electrification plans) for strengthening of 132KV and below distribution systems by taking in to account, the load growth for next 10 years. Financial assistance for this may be provided to by the Central government from case to case basis.

8) Effective Use of HVDS and Size of DTs:

HVDS network design is being practiced in Rajasthan, UP and Gujarat. HP and Assam have a conventional design due to the scattered location and right of way issues. The use of distribution transformers (DT) having capacity of 10, 16, and 25 KVA is prevalent. Currently DT capacity used is sufficient, but scenario may change as more APL consumers are connected to the infrastructure. Considering the enhancement BPL and APL load demand 16 KVA or 25 KVA transformers may not be sufficient for villages having 100 or more households. *However in some cases one 10/16 KVA transformer has been deployed for 2-3 household in hamlets. Under this context the capacity of DTs needs a practical assessment* on techno-economic considerations, as there is scope for optimization. This may be done by latest GIS based digitized distribution system design. The far off hamlets with 2-6 households may be electrified through LT cables. HVDS is a very effective system and it should be continued in the next plan as well. It is felt that since large number of small capacity transformers are deployed and more will be deployed in near future, distribution companies need to build sufficient number of workshops for the repair of these transformers, as it was observed in the states like UP, RJ, HP , small capacity of transformers are not generally repaired due lack of workshops.

9) Adequacy of Distribution Network and Cause of DTs failure:

The failure rate of the transformer is found to be much higher in rural areas compared to urban areas. The failure rate of DT in Rajasthan's rural area is 8-10%, while in urban area it is 2 to 3% only. The failure rate in Gujarat and UP was 12.96% (2009-10) and 10-13% respectively. The transformer life should be 25 Years; which is considerably less in rural areas. The failure rate is comparatively low in Himachal Pradesh. The failure is generally attributed to (a) illegal hooking and theft, (b) aging, (c) over loading, (d) failure of the protection system, (e) poor earthing, (f) tampering with the installation for theft, (g) load balancing in 3 phases of DT etc.

Electrification of Partially electrified villages in HP were retrofit projects, for which they desired that use of 63 KVA DT may be permitted due to the scattered population in the hilly villages. It is suggested that (a) infrastructure must be augmented with proper assessment of load through regular monitoring; (b) Repair workshops for transformer repairs should be established at the DISCOM level (c) Completely sealed type transformers could be deployed in rural areas to enhance transformer life. *A detailed system adequacy assessment should be carried out by DISCOM after 2-3 years of RGGVY project implementation* and it must be a regular exercise. Consumer load growth in rural area will happen rapidly, hence the overall T&D system needs to be strengthened and improved to cater to the demand. The state government should strengthen the network system through their own funds or by the use of RGGVY funds or by taking loan from financial institutions.

10) Decentralized Distributed Generation (DDG)

Introspection on **DDG** scheme is called for in order to ascertain reasons for complete absence of any working DDG projects in the states surveyed. DDG scheme needs to be revamped and promoted more aggressively particularly in light of the sharp drop witnessed in the cost of solar energy. These systems on standalone basis or in hybrid mode with other renewable technologies could be more cost effective alternative in many remote locations. Prima facie, the constraints seem to arise from information asymmetry, complex procedures, structural barriers and lack of ownership that prevents private initiatives including PPP in implementation of DDG. Villagers preferred to have solar based DDG projects. In Rajasthan DISCOM officials liked the idea to have DDG projects in the villages but majority of them

suggested to be implemented in a Public-Private-participation (PPP) mode. State Nodal agencies for renewable in Rajasthan and Gujarat are pursuing large renewable energy projects and implementing these in PPP mode, but are lukewarm to DDG scheme under RGGVY. Two main reasons for delay in DDG 1) lack of clarity on ownership of the project and security of installation 2) lack of incentives for entrepreneurs 3) poor operational revenue form the projects as highlighted by the entrepreneurs. To overcome this *Generation Based franchisee model and off-grid distributed generation franchisee model may be adopted under the existing DDG scheme through a competitive bidding process.* DISCOM should identify such models in consultation with the State Nodal agency to attract private sector participation.

DDG projects should be eligible for renewable energy certificates, which facilitate states to meet renewable purchase obligations. *Ministry of Power can take up the initiative along with CERC to decide upon an attractive feed in Tariff for DDG projects as it will help in a big way in bringing private players in DDG area.* It is also recommended that a simple attractive feed in tariff with fixed capital subsidies will be a good way of deploying DDG projects in large scale in rural areas as it will bring private sector investment and expertise.

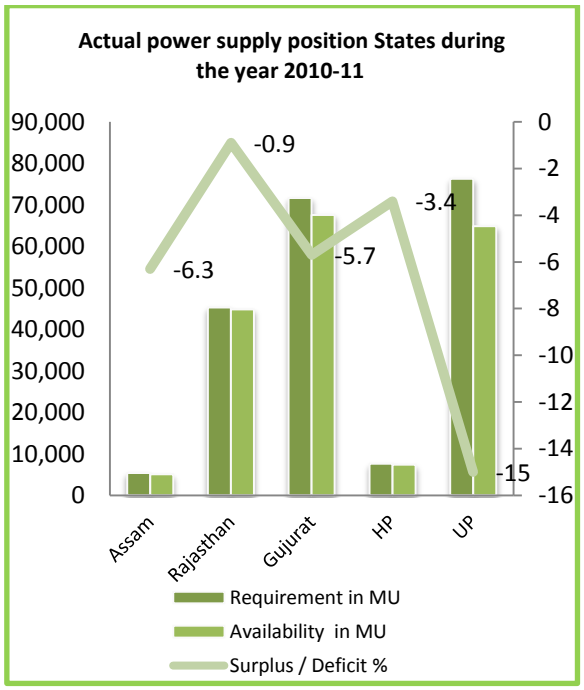
Franchisee based DDG system can be integrated with RGGVY franchisee model. DDG projects should be connected to Grid to make it commercially viable. DDG project must be continued with the proper restructuring of the scheme as it will ensure adequate supply of electricity in remote villages.

11) Extra power Availability for RGGVY:

The commissioning of RGGVY infrastructure has generated demand for additional electrical power. In the eleventh plan approximately 54900 MW power (capacity) has been added, but there are demands from various sectors. Each state is facing a power deficit scenario and higher demand deficit during peak hours as indicated in figure 4. The states manage the shortfall through open access, while maintaining cost component within reasonable limits.

An approximate and hypothetical power demand of the rural domestic sector is indicated in Figure 5. The extra power demand due to RGGVY can be met by (a) electricity generation from renewable, (b) energy efficiency including reduction of T&D losses, (c) open

access to the grid. Rajasthan SEB has taken up Transmission and Distribution network strengthening which includes are Feeder Renovation program (FRP), Gram Panchayat Vidyut Vitaran Yojana etc. Many thermal power stations are being constructed in UP. In 12th Plan UP shall have adequate power to supply to meet the demand of rural areas if plants gets commissioned on time. Gujarat Regulatory Commission plans power demand in advance and any shortfall on this account is met by open access. Assam is a power deficit state; they can plan for large scale renewable generation or negotiate for more power in an open access area. Proactive Demand side management in rural areas can help to manage the electricity demand from rural areas.



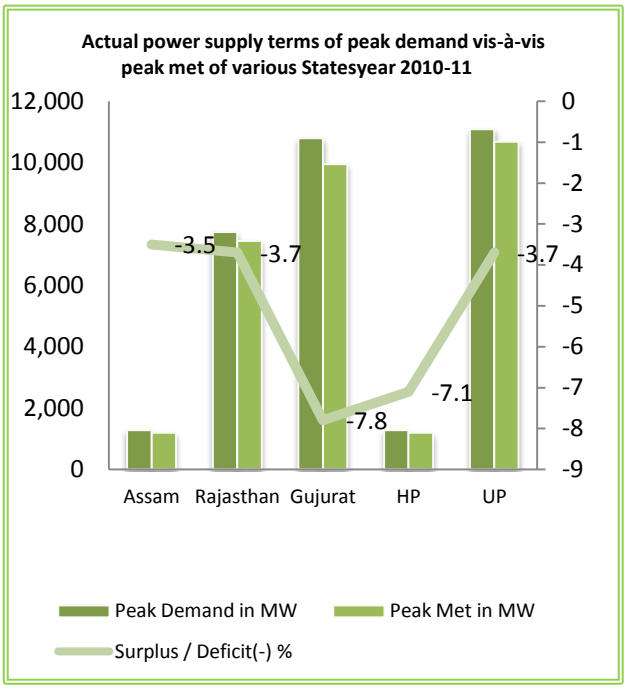


Figure 4 Actual supply position and power demand during peak hours in the states surveyed

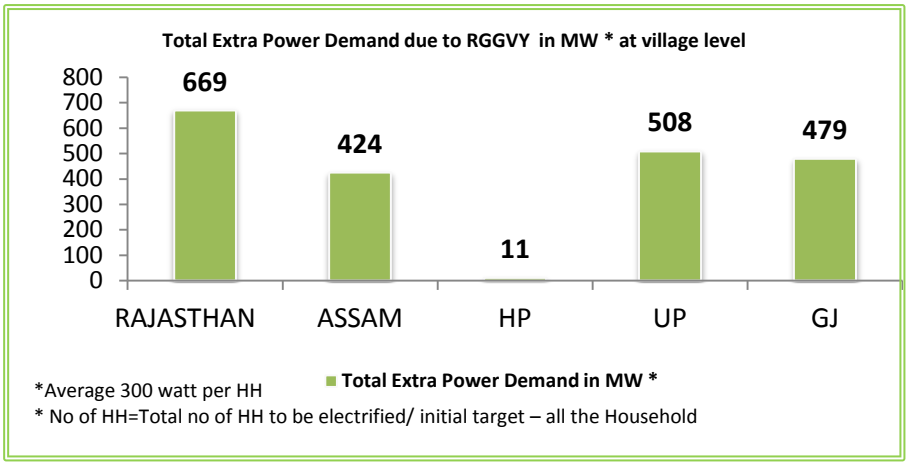


Figure 5 IRADe estimate of extra load demand from Rural Domestic sector

As per the IRADe analysis total extra power demand due to RGGVY connections at the village level are 669 Mw,424 Mw ,11 Mw, 508 Mw, 479 Mw in Rajasthan, Assam, HP,Uttar Pardesh, Gujarat respectively. This demand will vary depending on various factors including the level of electrical appliance penetration in rural areas. Rural areas are good platform for development of Renewable energy based power generation facilities. The Government has announced incentives such as Feed-in Tariff (FIT), RPO, and renewable energy certificates (RECe). An entrepreneur can exploit these opportunities provided by the incentives in rural areas and generate power from renewable source. The state government can provide incentives in the form of (a) announce a stable FIT for entrepreneur and tax incentives, for solar plants in rural areas (b) energy pooling at block or circle level.

12) Deployment of franchisee and their efficiency:

No operating franchisee was found in the surveyed RGGVY villages except in some areas of Assam, Gujarat and UP. DISCOMs have outsourced some of its functions in the revenue cycle and have named it as a franchisee. In most of the cases billing is outsourced. The revenue is collected at local DISCOM office in the block. Some states like Gujarat have links with banks and post-offices to collect revenue. "Franchisee Systems" could not mature the way it was conceived because rural population is not having the adequate paying capacity and the cost of serving the rural consumer is very high. Entrepreneurs are also not interested in rural franchises as it does not make a strong business case for them. In Himachal Pradesh average cost of billing and collections (DISCOMs) is around 5-8 rupees per households. HPSEB initiated the process of deployment of franchisee for which it received bids in the range of 10-15 rupees

per HH and for certain hilly places it was in the range of 20 Rs per household. There is an urgent need for DISCOMs to freshly calculate their Benchmark cost for each distribution circle and it should be put in the public domain, and this cost estimation should be done by an independent agency under the guidance of the State electricity regulatory commission. These benchmark costs will enable the private sector to devise more innovative and economically feasible business models.

DISCOMs/EDCs are interested in developing franchises on the basis of single point supply with bulk supply tariffs, but economic viability in rural areas has not made it feasible. Assam, in some pockets has input based franchisee, but their performance is not good and no new franchisee's are coming up . *The Franchises are not coming up due to the Poor Hours of Supply, Poor Consumer Mix, Scattered Villages (low density), lack of accurate benchmark and baseline data, commercial dispute due to contractual obligations, lack of the financial feasibility of franchisees in rural areas. Most of the franchises business model , the profits are linked to T&D losses and overall trend in decline in Transmission and Distribution losses in the states. As Transmission and Distribution losses keeps on declining the financial profitability of franchisees becomes difficulties, thereby making it less attractive for the entrepreneurs for a long term perspective.* Revenue collection from rural Gujarat is healthier than other states and DISCOMs.Gujarat is pursuing various form of franchisee as the suitability like (i) Feeder Franchisee (for Maintenance), (ii) E-Gram (for revenue Collection), (iii) Post Office (for revenue Collection), (iv)MEGA - Management of Electricity by Gram Associate (Collection based revenue franchisee). The identified challenges in franchisee implementation are (a) franchisee too have inadequate capacity to meet financial, administrative and regulatory requirements, (b) Shortage of skilled manpower at local level, (c) Resistance from employee unions who may perceive it as back door privatization, (d) Inability to meet eventualities like accidents, natural calamities, disputes related to issues of service deficiencies.

During the interactions with stakeholders, some of the suggestions were (a) Banks; financial institution may give financial guarantees on behalf of franchisee, (b) capacity building of DISCOM executives on franchisee through hands on training (c) involving retired employees in the franchisee deployment.

The state government may tender for generations (renewable) based franchises models for cluster of villages, where franchisee will generate electricity and also distribute it to the consumers. The system can be connected to the state grid for accounting purposes. Gradually they may be empowered to issue bills, collect revenue and perform operation and maintenance. *The defined financial mechanism will make Franchisee System more attractive and sustainable. Since franchisees are not coming up, the conditionality in the RGGVY for 12th plan may be relaxed, and state governments should explore the alternatives to franchisee system as per their suitability and decide upon franchisee based business models as per local conditions.* The franchise model with viability gap funding may be considered for remote and hilly villages and franchisee should be awarded through a competitive bidding process.

13) Adherence to Implementation Schedule, Delay in Implementation, Monitoring:

RGGVY projects at village level in Gujarat and Rajasthan were executed in time except in some special cases. Delays in project implementation were observed in the state of Assam, HP, RJ and UP due to a combination of factors like (a) delay in bidding process, award of contract to turnkey contractors, coordination and administrative delays (such as clearance of land, forest clearances, approved BPL list) between PIA and DISCOMs, (b) grey areas in the DPR preparation leading to revised cost estimates, (c) Asset transfer from PIA to DISCOM due to pre-handover inspection, (d) lack of locally available manpower both skilled and unskilled, (e) issues in getting certification from Panchayats and others, (f) insurgency concerns in the in states of Assam (g) lower stake of states and absence of dedicated manpower in DISCOMs. Delays occurred where the scope of work defined in DPR was not matching with ground reality; the inappropriateness in DPRs was observed in almost all the DPRs studied. There were issues such as identification and location of eligible BPL Consumers, routing of VEI-LT and HT lines. Law and Order situation needs to be factored in while formulating schemes. While appreciating the challenges in making correct DPR, DPR must provide detailed drawing, planned Distribution system as per DPR, without this DPR should not be approved.

Figure 6; indicates the level of energization in the surveyed villages. The work of electrification in the villages were in progress, however the work was not complete for hot trial

run of network for testing. In Assam (Dibrugarh), there appeared to be lack of logistics and lack of manpower even at subcontractor level. Recent information is that the remaining villages in Dibrugarh are electrified. In Himachal there was heavy snow in the financial year 2011-12 leading to impediment in progress of work. Commissioning of Substation in Pangi Valley was delayed which was to be commissioned by March 31, 2012. Substation commissioning in all surveyed areas were delayed.

The implementation schedule in the villages and block level has been analysed in four components (a) substation [issue was land allocation, and receipt of materials from manufacturers, material transport, tapping from 33 KV line], (b) laying of HT Line [forest clearances, and right of way], (c) Distribution transformer and LT Line [land and right of way, deployment of gangs by sub-contractors], (d) Logistics and other constraints [social conflicts, approach roads and bridges, enabling services, weather conditions affecting execution of project]. Weather is a big project hindrance in Assam and HP due to flooding and heavy snow, respectively. Other observations:

- Handling of Turnkey projects and problems (a) Gaps in DPR and contracts are not resolved amicably (b) During project execution the role of DISCOM is limited, project supervision gets neglected, the problem comes while taking over. The capacity building of contractors carrying out execution is required.
- Engineering wing of the REC and utility -level planning, to suggest the Distribution system engineering and appropriate network design.
- Slackness in professional management due to frequent change of personnel and responsibility at utility level. Dedicated functional rural electrification department is essential and must be created in each DISCOM. It should be a upfront commitment by the state government before the implementation of RGGVY in future.
- Panchayat must reply within 30 days from the date of receipt of the certificate format (it must be in local language). Certificate format may be sent through courier /post from PIA. Involvement of Gram Panchayats/Sarpanch during project execution is desired as it will help in effective implementation of the project at the village level.
- DISCOM should complete inspection of infrastructure and give directions to PIA to make changes, if any within 15-20 days of the request from PIA.

- Selection and deployment of sub-contractor at the state level may be on pre-defined and for which specific guidelines may be prepared.
- DISCOMs may provide Security arrangements for PIA in the disturbed areas.

It is observed that in Gujarat and HP (except in Spiti and Chamba district) state, projects are implemented within schedule although some delay were observed. In these states decision on project implementation through a turnkey Contract or through few separate Design/supply/execution contracts could be left to DISCOM/SE (Distribution Circle) to improve the effectiveness of implementation. Considering the current level of progress it is felt that Turnkey basis for entering into implementation contracts by PIAs may be changed to work contracts designed by DISCOM/EDCs to effect the economy and quality work on a case to case basis.

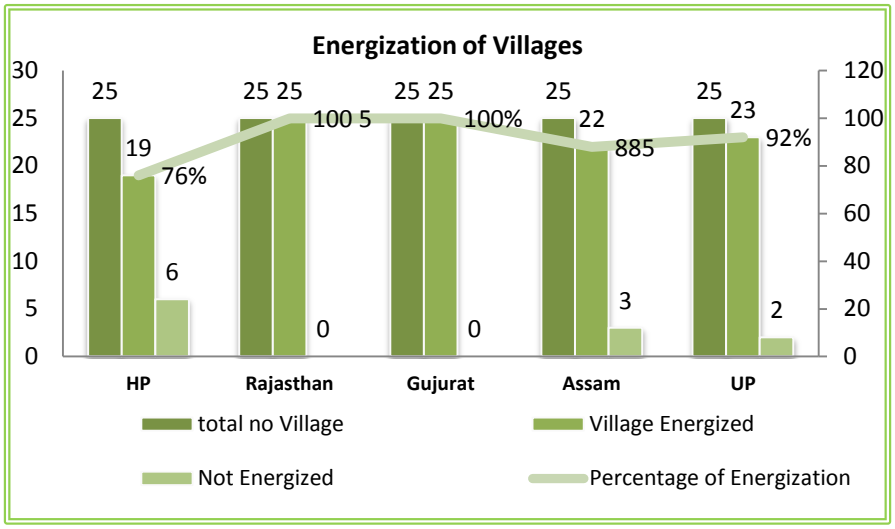


Figure 6 Level of energization in the surveyed villages in each district

The RGGVY is monitored through RGGVY monitoring committee and a detailed MIS system is followed. However it was found that MIS is unable to give accurate and timely desired information, therefore real time MIS be put in place. There is a need to constitute an independent monitoring committee to ensure better monitoring of the program.

14) Quality and Effectiveness of Detailed Project Report (DPR):

DPR defines the project overview which includes estimated bills of materials, scope of work based on demography, landscape, previous status of electrification, implementation schedule, approved technology, and manufacturers and material suppliers etc. During the DPR preparation process certain assumptions are made. It is understood that DPRs were prepared

in a hurry with inadequate inputs from the fields to meet deadlines. However the gaps were addressed during submission for revised DPR to some extent. Preparation of supplementary DPR in some districts became necessary. Demand of APL and BPL load may vary from state to state; however as per the survey a standard load for BPL and APL consumers may be fixed at 0.25 KW for BPL and 1.0 KW for APL HHs with some flexibility. This assumption is important for estimating REDB infrastructure and DT capacity in VEI. It was observed that due to the large number of DPRs and limited staffs' in REC, project offices' proper scrutiny was not possible. During the survey it was observed that villagers are using 2-4 number of 100 watt Incandescent bulbs per households. In 12th plan LED bulbs may be distributed to BPL households which will have much lesser power demand. State government should devise schemes in which all the BPL households (both 10th and 11th plan connections) may be given LED bulbs to reduce load per house hold.

The PIA's have moved for Revised Cost Estimate (RCE) for the district due to change in Bill of quantity and uncovered items in the DPR. Some of the reasons given are (a)The estimated number of substations to be built, new or existing substation being augmented, changes during post survey estimates (b) Reconductoring of 33kV Line ahead of Substation as point of tapping was not identified, (c) The requirement of 11/0.433 KV Distribution Transformers increased due to hamlets, (d) For HVDS system, 11 KV lines were to go up to the consumer cluster, but due to clearance problem, lines have been terminated at the village entrance, hence LT line component changed, (e) Requirement of Line sections and other hardware's changed, (f) Increase of price for major raw materials like steel, aluminum, copper, labor, (g) Service tax on PIA's service charges has been included in the RCE. These factors may be taken care of while preparing DPR . GIS technology (has been attempted in some states) may be used in DPR preparation in future projects and auto CAD (specifically for Rural Network Design) be used for prepration of drawings. The baseline data for BPL connection for the 12th plan may be revised based on 2011 census information and for Hamlets (as correct data sources are limited) an assessment should be carried out to know the exact no. of hamlets for population below 100. DPR may include warranty and two year operational spares as a provision. Proper Training for DPR preparation must be given to PIA/DISCOMS. DPR should be prepared based on accurate information to the extent possible and sample survey must be conducted to collect data.

15) Formulation and Implementation of RE Policy:

All the four states Assam, Gujarat, Himachal Pradesh and Rajasthan have notified Rural Electrification Plan (REP). There is ambiguity about Uttar Pradesh as we could access draft plan. All the studied REP does not very clearly spell out the strategy and state plans for Operation & Maintenance of the RGGVY infrastructure and its augmentation. It was observed during the interaction that, extensive consultation has not taken place at the states while preparing the REP. A committee should be formed for developing the REP at the state level and REP plan should be reviewed via-this committee chaired by Energy Secretary. Amendments may be made to REP if required. During the revision, efforts should be made to integrate the State Rural Electrification schemes and other complementary programmes with the REP, and REP should be a part of broader planning process of the District planning. Ministry of Power in consultation with State governments should asses to what extent REP has been adopted in letter and spirit, understand the issues, gaps and challenges in adoption of REP and jointly work out the intervention needed to full implementation of REP.

The rural electrification plan will need revision for 12th Plan, based on the current achievement in rural electrification while emphasizing (a) development of rural commercial activity, (b) linkages of renewable energy systems to the grid using appropriate technologies, (c) human resource development and transformer repair facilities development. The responsibility to make best economic use of infrastructure created under RGGVY rests with State Governments and DISCOMS. REP should provide guidelines for application of the ~8% RGGVY fund to augment delivery facilities, or any additional source of fund for strengthening of the administration of DISCOM as envisaged under RGGVY.

The Rural Electrification Plans must specify the role of the Central Electricity Regulatory Commission and State Electricity Regulatory Commissions in the rationalization of tariff structures for generation, transmission and distribution, such that the villages situated in far flung areas from the large energy sources for generation are not penalized with much higher tariffs due to their geographical locations. The REP must be available in the public domain.

16) Electricity subsidy by State Governments:

Each state government has provided subsidized electricity tariffs (Annexure 2) for BPL households, rural HHs, and agriculture. The information of rural subsidy is available in the Himachal Pradesh tariff notification. DISCOMs in Gujarat State are making operational profit, hence they are in a position to manage lower tariff for BPL consumers. Cross-Subsidies in tariffs and allocation of losses are to be built into tariff order by SERCs. Rajasthan REP estimates that the total subsidy burden on the government of Rajasthan due to the BPL connection will be 115 crores of Indian rupees per annum. However it suggests the subsidies to be financed by both cross subsidy and budgetary/cash support from Government of Rajasthan. The tariff for BPL population in Assam (Jeevan Dhara) is Rs 2.50, excluding fixed charges. The surcharge is levied on tea gardens to provide a cross subsidy. The special tariff for BPL households in the state of HP, Rajasthan, Gujarat and UP is Rs 0.70, Rs 0.85/ unit (after deducting the Subsidy), 1.50, and 1.00 per unit, respectively. This excludes fixed charges.

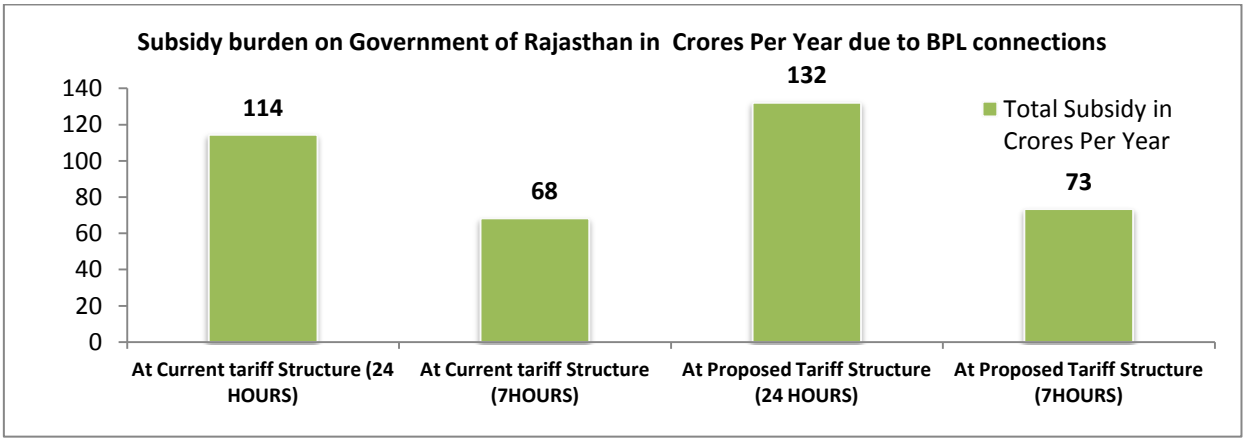


Figure 7 Subsidy burden on Government of Rajasthan in Crores Per Year due to BPL connections

The Government of Gujarat provides subsidy for Agricultural consumption with power supplied through separate feeders. The UPSEB provides subsidized power for private tube wells/pumping sets for irrigation purposes, where the rates are fixed depending on size of pump-set. Gujarat DISCOMs in total booked Rs. 3300 Cr subsidy and received the same amount from State Govt.

17) Challenges faced by DISCOMs, long term sustainability of Rural Electrification and the role of stakeholders:

DISCOMs have to operate and maintain RGGVY infrastructure efficiently. Main constraints are poor financial health, lower tariff, high cost of supply, manpower shortage, high AT & C losses in rural areas, logistics and access to the site, with site difficulties. The challenges

for the same are (a) enhanced revenue generation, (b) Need based optimum power supply to villages, (c) improved Billing and revenue collection system. There is a need to develop economic activities in rural areas through state level intervention to make the RGGVY investment sustainable and avoid suboptimal use of RGGVY infrascturutre. Dedicated Rural Electrification department should be created in the Energy Ministry of the State, in respective Discoms and in the Holding Company. Promotion of DDG scheme may be a potential solution for additional Power. During the survey it has been found in some villages where the connection that are released under Kutir Jyoti scheme (KJS), are practically disconnected. In certain cases the same BPL who received connection earlier through the KJS, is getting new connection to RGGVY. This explains the need to have a long term view for the sustainability of rural electrification as the connection released so far faces a risk of de-electrification in the future. The existing management of the RGGVY scheme can be augmented with higher participation of the state government by providing manpower, developing franchises, having a parallel scheme for expansion of rural electrification in tune with the State Development Plan.

Ministry of power is responsible for overall Design of the Program and preparation of Rural Electrification Policy (notified in 2006), program review and monitoring was (reviewed and modified in for the 11th Plan.) Progress is good, (83% BPL achievement all India.) despite all constraints. To further improve the proper Implement of the RGGVY, following suggestion has emerged out of the study for consideration.

State Governments are responsible 1) Deployment of franchisees for the management of rural distribution 2) Determination of Bulk Supply Tariff to ensure commercial viability of franchisees 3) Provision of requisite revenue subsidy to the state utilities 4) Adequate arrangement for supply of electricity without discrimination in the hours of supply between rural and urban households 5) Provision of an authenticated BPL List 6) Notification of RE plans. It was found from the survey that More than 7-8 Hours of supply is available in most of the villages but varies from village to village. Status of ffranchisee deployment is poor. System Augmentation is good in Rajasthan, HP, GJ; and poor in UP due to the higher load in villages, in Assam the status is improving. All the states have notified REP notified except UP.

The district monitoring committee (DMC) is responsible for coordinating the implementation of RGGVY at the district level. DMC meeting is effective where ever it is held regularly. In many places it is not happening. It mainly works as enabling service by resolving conflicts, and land allocation, local conflicting resolution etc. The functions of the District Monitoring Committee may be regularized; based on the agenda prepared by DISCOM. As listed earlier, there are many stakeholders and each stakeholder is aware of their responsibilities but each stakeholder find various constraints in fulfilling their responsibilities. RGGVY was designed and planned largely at the central level by MoP & REC and there is need to have more decentralized planning in 12th plan; as primarily success of rural electrification lies in the hand of state governments and DISCOMS.

Considering issues faced in 11th plan projects following suggestion may be looked in:

- There should be RGGVY center, state RGGVY steering committee for each state that should look into state specific issues. Issues such as grants be converted to interest. Bearing Loan in case of non-fulfillment of the RGGVY conditionality. This steering committee should have a broad based approach not just towards RGGVY implementation but also for overall rural electrification in the state.
- Ministry of Power (MoP) should asses the performance of RGGVY infrastructure created over its life time. Draw a holistic plan/Road Map for best utilization of the investment made, in consultation with State Governments (as it was observed that some recently electrified villages were heading towards the de-electrification). It should be integrated with the overall distribution reform strategy adopted by the Ministry of Power.
- For smoother implementation and effective monitoring, Ministry of Power may strengthen RGGVY monitoring Committee through wider participation of indepent experts to oversee the implementation in 12 th plan.
- 90:10 funding pattern is adequate, but for backward system augmentation MoP may devise scheme for giving soft loans /Grants to the State Governments (60-40 Ratio). It may be linked with National electricity fund.
- MoP and REC can guide preparation of the revised REP for the state for 12th Plan. State REP implementation progress should be reviewed by the committee chaired by Energy Secretary.

- MoP should incentivize DDG scheme in power scarce region with a combined strategy of achieving renewable purchase obligation and gain from trading Renewable Energy certificates. More money should be allocated in 12th plan for DDG and project should be awarded through competitive bidding. Security and ownership issue of DDG system must be addressed
- Although 3-tier quality monitoring is satisfactory, but quality of inspection should be improved and qualified persons should visit villages for inspection. Proper training should be given for conducting effective inspection.
- REC and CPSUS should share their expertise with DISCOMs, though CPSUs also are overshooting implementation schedule
- The state should conduct its own independent evaluation of RGGVY and own rural electrification schemes, under the guidance of SERC.
- The state should create Rural electrification fund for proper maintenance of rural infrastructures.
- DISCOM should conduct load and Infrastructure adequacy assessment in every 3 years in RGGVY villages and plan augmentation on DT or request for augmentation of REDB.
- DISCOM must maintain a digital database of every village in terms of load, energy supplied and others. Devise circle wise O & M strategy for Rural Feeders.
- District Monitoring Committee (DMC) should encourage strategies for energy efficiencies in rural areas. DMC should devise district road maps for energy efficiencies with particular focus on rural areas.

18) Suggestion for Continuation of RGGVY in 12th plan:

RGGVY programme has achieved intended objectives to a large extent. In the twelfth plan the infrastructure that is created has to be sustained with good operation and maintenances, strengthened to cater to the greater load for economic activities. The RGGVY scheme should be continued in 12th five year plan. Key Challenges in 12th plan will be supplying adequate electricity, sustainability, efficiency and effectiveness of rural electrification, in addition to the challenges of electrifying remaining household particularly living in hamlets with less than 100 populations.

Following observations may be considered

(i) Electrifying the remaining BPL household and all the Hamlets below 100 populations (limits may be revised) should also be covered under RGGVY in 12th plan to meet the target of electrifying all BPL HHs.

(ii) Strengthening of Rural Electricity Infrastructure (more number of 33/11 KV SS) to provide connection to the remaining households (both APL and BPL). In 12th plan, infrastructure should not be designed only to meet the need of the BPL, but also should meet the needs of APL. Augmentation of the network, backward linkages (may be separate feeder)is needed with inclusion of productive loads that should be taken-up in the next plan for agriculture and commercial activity.

(iii) New guidelines may be prepared for providing grants/soft loans/support to state governments for strengthening of rural distribution system, system augmentations, feeder segregation and bringing productive loads in villages based on earlier performance. The investment made under RGGVY program should be made through the distribution circle instead of districts, by making a distribution circle as the cost and profit center. RGGVY program may be restructured accordingly.

(iv) Electricity services in Villages can be sustained only on commercial basis and an appropriate consumer mix is essential for this. Necessary efforts must be made both by the Central and State governments to provide electricity to all consumers and generate commercial activities in rural areas.

(v) More responsibility should be given to the State governments to raise their sense of ownership for the programme. Rural electrification plans are financially not sustainable and the Centre must provide further financial support to the state government as it will help in improving sustainability of rural electrification.

(vi) The cost of APL connection is approximately in the range Rs 2000-3000. The initial payment is high for APL consumers in some states. In order to fulfil the vision of providing electricity for all, and sustain rural electrification, the APL connection to remaining APL consumers may be provided at a discounted rate. The central government can give certain financial support for the release of APL connections, and cost of connection may be shared between state and centre.

(vii) Energy efficient equipment must be marketed in rural areas at a reasonable cost which will prevent inefficient utilization of rural distribution network. DMC should devise district road maps for energy efficiencies with particular focus on rural areas.

(viii) DPRs investment plans, need not be district based; and Centralized Investments may be made 'Distribution Circle' wise. The distribution circle should be made cost and profit centers to improve the accountability and efficiency of investments.

(ix) The engineering division under electricity holding company should be strengthened to take care of (a) rural network design (distribution feeder) to reduce the AT&C losses, (b) balance right of way for HT and LT lines. Similarly contract division and revenue section be strengthened. Assessment must be carried out on the impact of RGGVY infrastructure on the overall distribution network in the implemented area. Based on the assessment, necessary distribution system planning must be done.

(x) In 12th plan RGGVY programme should ear-mark some fund for R&D to develop cheap and reliable smart meters, develop interface linking renewable grid to state grid, energy efficient equipment's used in rural India, computer aided rural network design that includes VEI and REDB. GIS based pilot project for DPR preparation can be taken up based on computer aided rural network design.

(xi) T&D losses in rural network will be high due to village structure. ESCos should be encouraged to take up up-gradation of pump-sets. DISCOM experts mentioned that the losses in single phase transformers are lower. ESCos prefer 3 phase supply for pump-sets. Hence separate feeder for domestic and agriculture may be considered.

(xii) Greater level of cooperation between the Bureau of Energy Efficiency (BEE) and REC for incorporating gains from energy efficient household commercial, agricultural and industrial appliances.

(xiii) Both in 10th plan and 11 th plan , the whole approach towards the Rural electrification has been largely on the distribution infrastructure assets creation, which has been implemented very successfully so far. In 12th plan, a more comprehensive approach is required towards rural electrification of commercial facilities with a shared vision between Central and State governments.

Five Point Analysis of RGGVY Program

Five Positive aspects of RGGVY :

1. The Rajiv Gandhi Grameen Vidyutikaran Yojana (RGGVY) has been able to build a good quality infrastructure to sustain electricity supply for the rural Areas. This has ensured supply of electricity for more than 6-8 hours in large number of Villages although reliability and quality of supply need to be improved substantially for long sustainability of rural electrification.

2. RGGVY program is beginning to implement the objective of "Rural Electrification Policy" although more efforts are needed. The program has enabled the States to prepare The Rural Electrification Plan, thereby bringing a much needed focus towards rural electrification in the states.

3. For the first time in India, the large number of marginalized population of the society has been provided electricity connection a free of cost. It has also opened up opportunities for APL consumers to get electricity connections.

4. Positive Socio-economic impacts were observed in the newly electrified villages. Comfort, education, and health has improved immensely, as responded by the householdsHowever it is found that current level of electrification is not sufficient to create overall economic development in the villages as envisaged by the Rural electrification policy. For sustainable positive impact, quality of supply, reliability must be improved substantially.

5. Process of harnessing renewable energy by Decentralized distributed generation has been launched, though it has not picked up the way it was desired, but could gain ground in grid connected mode. The progress of DDG scheme will enhance energy availability in future and key sustainability of rural electrification, therefore this program should be pursued aggressively in future.

6. The System of Operation and maintenance of the infrastructure and services have been structured and processes of providing efficient services in rural areas are developing and should be augmented. RGGVY programme gave new opportunity of employment to the rural youth by incorporating 'Franchisee System' as a necessary condition in Distribution Management, wherever franchisees are operating.

Five Negative aspects of RGGVY:

1. DPR preparation and DPR approval process is not very effective. DPR template is extensive and elaborate but is being prepared with insufficient inputs. There is general coordination problem in acquiring information and proper survey is generally not being carried out. The load assumption at household level is low that need to be increased both for APL and BPL consumers. As DPR is the main document, which has impact on whole execution and implementation cycle, due to the inaccuracy in DPR preparation a lot of execution and implementation delays are occurring. This has led to revised cost estimates and , delays in approval RCE etc.

2. Inadequate and poor quality Power supply is great constraint in rural electrification. The poor financial health and poor service delivery mechanism and overall governance in rural areas of Discom are becoming a major challenge of long sustainability of Rural Electrification.

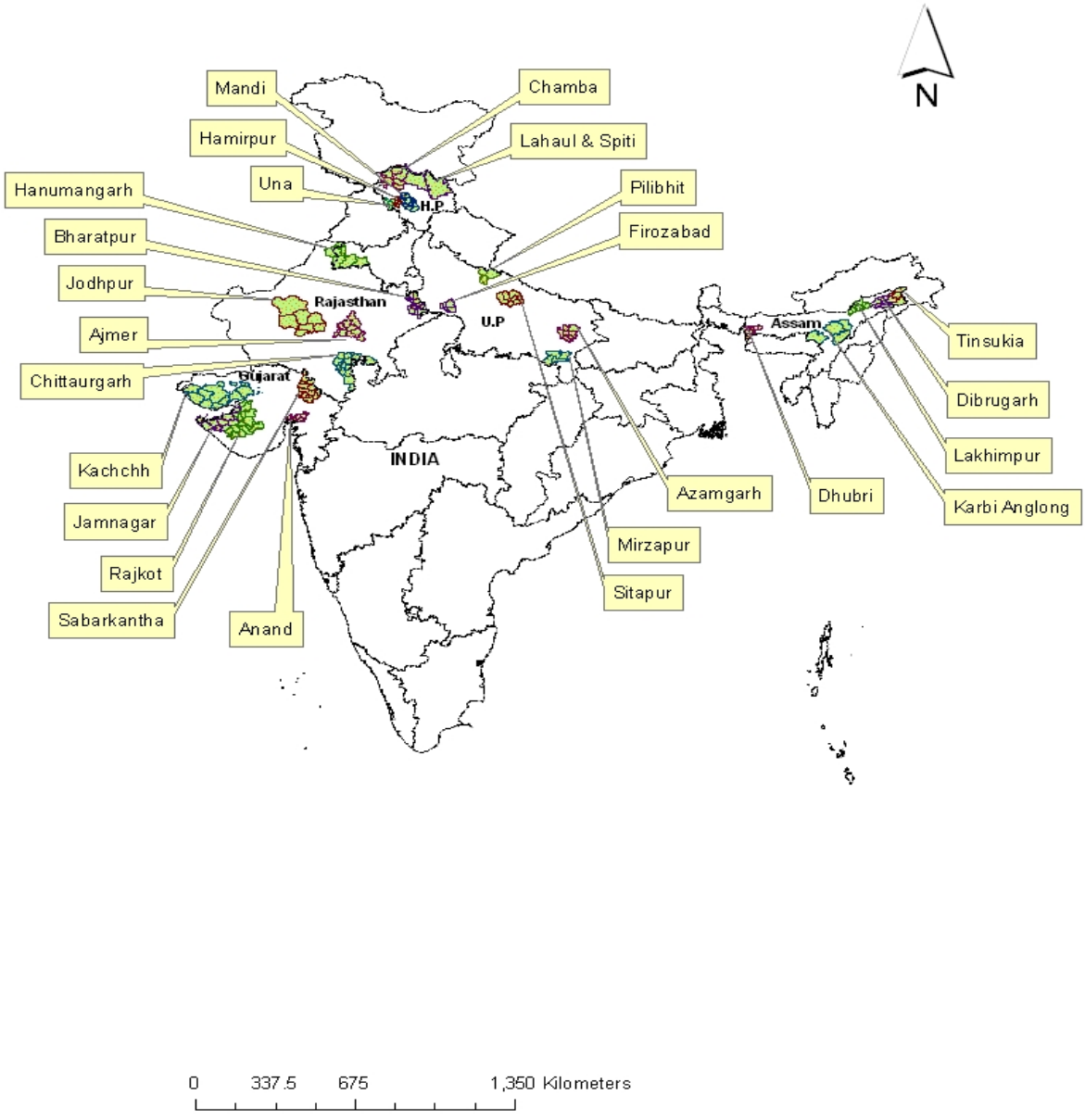
3. Due to the Mission mode approach towards the RGGVY, whole planning and to some extent execution process has been very centralized and top down approach has been followed. Although top down approach has helped but it also created a lack of ownership by states in the whole RGGVY programme, which lead to delay in preparation and notification of quality rural electrification plan, co-ordination and administrative delays etc. Program lacked a comprehensive approach as more attention and emphasis was given to achieving targets whereas enough attention was not given to the availability of Manpower in Discom, augmentation of backward linkage systems, land acquisition for the substations, accurate BPL list, operation and maintenance of the systems , franchisees deployment , state specific issues.

4. Deployment of Franchisees has been very poor so far. It was envisaged that franchisees will ensure the revenue sustainability, now it has put a question mark on the revenue sustainability, as Discom are not able to do the service delivery in a proper manner in rural areas.

5. Although a huge amount of Distribution infrastructure has been created, but the backward system augmentation (backward linkages) and strengthening of sub transmission system has not matched with RGGVY infrastructure created. More over whole approach has been to create infrastructure mainly to meet the need of BPL and indirectly facilitate power to the requirement of agriculture and other activities. An adequate consumer mix of BPL, APL and commercial loads in villages is crucial to long term viability of rural electrification.

Annexure-1

RGGVY Surveyed Districts in 5 States



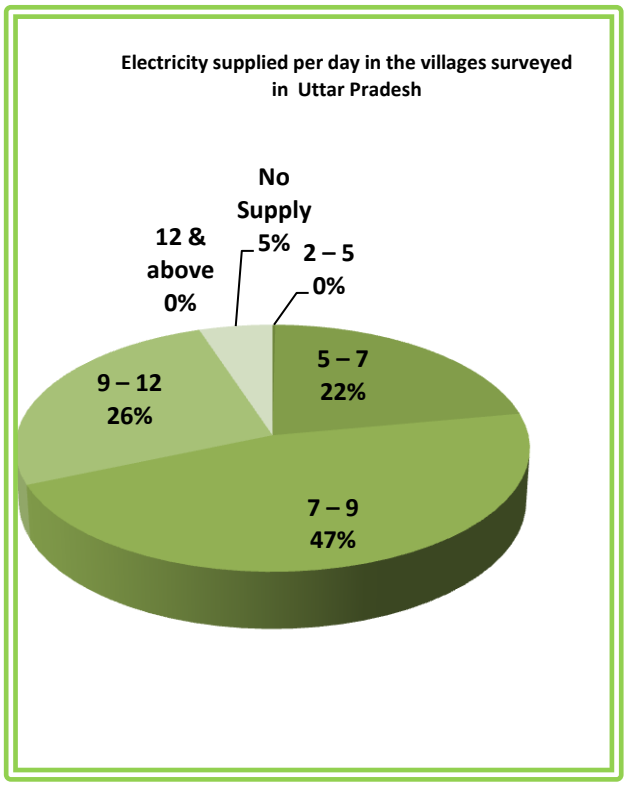
Annexure-2

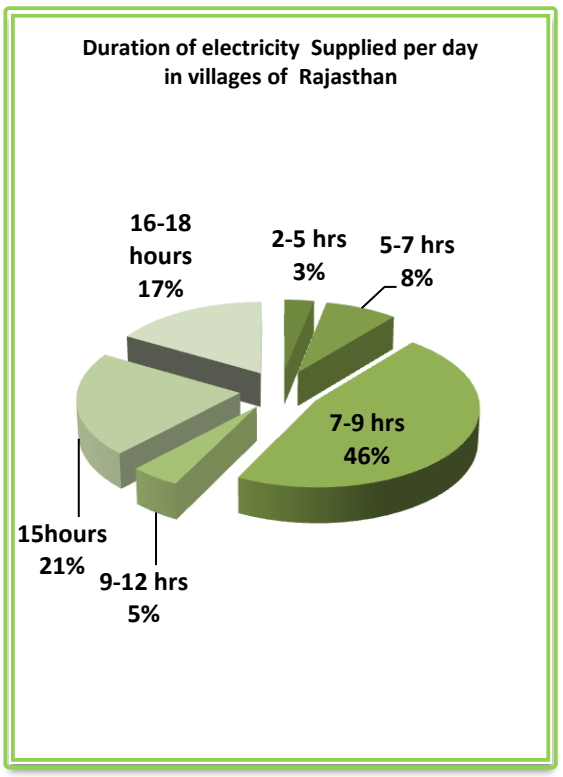
	Rajasthan Existing BPL Tariff				Rajasthan Proposed Tariff				
Category	Energy Charges (EC)			Fixed Charges (FC)	Category	Energy Charges			Fixed Charges
Domestic Rural & Urban	EC	Subsidy by GoR*	Effective EC after subsidy		Domestic Rural & Urban	EC	Subsidy by GoR*	Effective EC after subsidy	
Upto 50 units per month (BPL)	Rs 1.95/ unit	Rs 1.10/ unit	Rs 0.85/ unit	Rs 80/ consumer/ month (effective FC Rs 50 consumer/month after subsidy of Rs. 30/connection/month)	0- 50 units per month (BPL)	Rs. 2.25/ unit	Rs 1.40/ unit	Rs 0.85/ unit	Rs 80/ consumer/ month (effective FC Rs 50 consumer/month after subsidy of Rs. 30/connection/month)

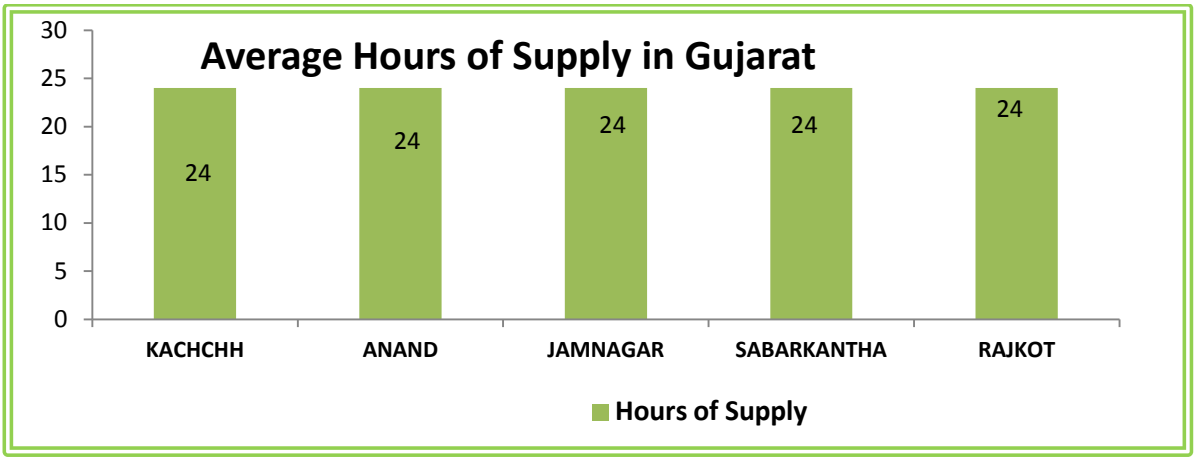
***Subsidy allowed as per GoR for BPL and Small Domestic Consumers consuming upto 50 units in a month.**

Name of State	Tariff for BPL	
	Tariff	Minimum Monthly Charges (MMC)
Himachal Pradesh	0-40 units – Rs 0.70/unit.	Nil
Uttar Pradesh	Rural Unmetered service connection: Rs 125/connection/month	Not Applicable
	Rural Metered Service Connection: Rs 1/unit	Rs 15/KW/month
Assam	For load upto 500W – for maximum consumption of 1 unit/day(28-31 units/month) - Rs 2.5/unit	Rs 15/C/M
Gujarat	0-30 units – Rs 1.50/ unit	Rs 5/- per month

Annexure 3-


Electricity supplied per day in the villages surveyed in Uttar Pradesh
No Supply 5%
12 & above 0%
2 – 5 0%
5 – 7 22%
9 – 12 26%
7 – 9 47%


Duration of electricity Supplied per day in villages of Rajasthan
16-18 hours 17%
2-5 hrs 3%
5-7 hrs 8%
7-9 hrs 46%
15hours 21%
9-12 hrs 5%


Average Hours of Supply in Gujarat
30
25
20
15
10
5
0
24
24
24
24
24
KACHCHH
ANAND
JAMNAGAR
SABARKANTHA
RAJKOT
Hours of Supply

2.RGGVY Evaluation Reports of Rajasthan, Uttar Pradesh, Assam, Gujarat, Himachal Pradesh

Integrated Research and Action for Development
IRADe

Report on Evaluation of Rajiv Gandhi Grameen Vidyutikaran Yojana (RGGVY) in the state of Rajasthan

Submitted to:

Rural Electrification Corporation (REC), New Delhi

Submitted By:

Integrated Research and Action for Development (IRADe), C-80, Shivalik, new Delhi.110017

Integrated Research and IRADe Action for Development

Evaluation of the Rajiv Gandhi Grameen Vidyutikaran Yojana (RGGVY) Programme: State of Rajasthan

REC
Endless energy. Infinite possibilities.

Submitted to: Rural Electrification Corporation (REC)

Integrated Research and Action for Development
IRADe

Submitted By: Integrated Research and Action for Development (IRADe)

C-80 Shivalik, New Delhi - 110017

May 2012

Contents

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Executive Summary:

1. The letter of award (LOA) for Evaluation of the effectiveness of RGGVY Programme of MOP, GOI in its totality and to suggest ways to make it more effective was issued by the Nodal Agency REC designated by MOP to IRADe to conduct the Study in five States on May 25, 2011. The Inception Report was submitted by IRADe to REC on June 6, 2011 and advance to initiate the study was released by REC on July 26, 2011.

The Study had to be conducted based on the Survey of five sample Villages in different Blocks in each of the five Districts in the State, specified by REC.

2. The Villages situated in different Blocks and Districts in the State of Rajasthan specified for sample study by REC are listed below. The field Surveys were conducted based on the field Survey of these Villages.

List of Villages to be surveyed in the State of Rajasthan:

Name of District	Name of Block	Name of the Village (Census Code)
Chittaurgarh	Arnod Begun Chhoti Sadri Chittaurgarh Pratapgarh	Depur (03757100) Ratanpura (03550600) Sakriya (03693400) Phusariya (03601900) Borwana (03745700)
Hanumangarh	Bhadra Hanumangarh Nohar	9 JGW (00481500) 1 PBN (00405500) 6 MD-A (00377400) 1 RMG (00464100) Rekh Ghariasar (00446900)
Bharatpur	Bayana Kaman Kumher Nagar Rupbas	Ghunaini (01082600) Mauroli (00977100) Nagla Moti (01032400) Jatoli (00966200) Ranpur (01093800)

Ajmer	Bhinay Jawaja Kekri Peesangan Arain	Soorajpura (02557500) Dewal Fatehpura (02532200) Dholai (02578300) Gigalpura (02512500) Laxmipura (02568600)
Jodhpur	Balesar Bap Luni Phalodi Shergarh	Chimangarh (01982700) Jesari (01908400) Mori (02001500) Fateh Sagar (01930300) Sadulpura (01970800)

3. The initiatives to obtain basic information from the RECs Chief Project Manager for the State, in specific, the Detailed Project Report (DPR) for the respective District/Distribution Circle, Villages, families, State level policy and programmes for RGGVY and Rural Electrification etc were started much earlier, but Survey at sample Village levels were started in the State towards end of July 2011.

4. The Survey was conducted such that feedback was received not only from the Villages Surveyed but also from all Other Stakeholders involved in implementation of RGGVY Programme i.e. MOP, GOI/REC HQ/REC Regional Office/Respective DISCOMs in State/Project Implementation Agencies/Participating Contractors, Monitors, State Govt, Regulators, CEA, Gram Panchayat, Sample Village families, and Franchisee where applicable.

5. As set of questionnaires were designed mainly for REC State RGGVY head Village families, Gram Panchayats, DISCOMs, State Govt, Franchisee, SERC etc for structured feedback. Unstructured interactions were also held with individuals from various Stake holders to get unbiased feedback on the implementation of RGGVY and its effectiveness.

6. Based on the evaluation study conducted in the State of Rajasthan and Assam a detailed presentation was made by IRADe on 13 October 2011 in a meeting taken by Shri Devender Singh JS MOP attended by REC management and TERI to bring out the issues which are considered important to be a addressed to improve the effectiveness of RGGVY Programme.

7. In the State of Rajasthan RGGVY Programme during 10^{th} five year plan covered, 1647 un-electrified Villages, 14931 electrified Villages and 4, 87, 662 BPL families to provide domestic electric connections. Total funds were Rs. 40328 lakhs for disbursement.

During the 11th five year plan the RGGVY covered 2240 un-electrified Villages, 13303 electrified Villages and 5, 17, 040 BPL families for domestic connections with available disbursement of Rs. 49461 lakhs.

8. Development of Detailed Project Reports (DPRs)

Implementing agency developed District/Distribution Circle wise DPRs for implementation of RGGVY Program and estimated the investments needed based on number of de-electrified or un-electrified Villages to be electrified and the total number of BPL families to be provided electrical connections. Based on the size, population and spread of the Village, Rs. 13-18 lakhs per Village were budgeted for Village electrification, and Rs. 2200/- per BPL connection were provided for providing electrical connection to each BPL household. The DPRs were prepared either by the Central PSU designated by GOI or by the State Discom after State government, REC; Discom had entered into an MOU to discharge their responsibilities and RGGVY Program.

The DPRs were prepared in a hurry to fructify the program and start its implementation. State REC office headed by Chief Project Manager (CPM) conducted field visits in respective Districts/Distribution Circles to verify the data DPR and make necessary improvements.

Central PSU designated by MOP or the State Discom who were required to implement District/Distribution Circle wise RGGVY Project owned the DPR and were Project Implementing Agencies (PIA) responsible for creation of VEDB and VEI for the Villages and implementation of DPR.

9. Sample Survey in Sample Villages

Efforts were made to cover 10-20% APL household and all the BPL households in the Sample Villages Surveyed. As per DPR, there were total 2153 families in the identified Villages, which included 638 BPL families and 1515 APL families/household. DPR provided for connection to all BPL households. It is observed that large no of BPL HH and rural Population lives in the small hamlets of less than 100 populations particularly in states like Rajasthan and Assam. Efforts must be made to electrify these households in 12 th plan projects.

10. REDB/VEI and Electrification in Villages Surveyed

DPR provided a target of providing electrical connection to all 638 BPL households and minimum 95 APL households in the Sample 25 Villages. The Connections provided were as follows.

Sample Villages 25	Total	With Electric Connection
Households Nos.	2153	471
BPL households Nos.	638	365
APL households Nos.	1515	106 (Target 95)

In the Sample Villages, as per DPR, 42 Nos. Transformers of 16 KVA each were to be installed, out of which 40 were found installed. In most of the Surveyed Villages intent of DPR has been effectively implemented to link the Villages to REDB and to VEI for providing electricity access to the Village. Even though the Transformation capacity has been provided as per DPR, the consumption exceeds the transformation capacity provided and transformer failure is seen due to transformer overloading. **Many of the APL households not provided with connections are unauthorized connected to the distribution system and overloading it.** It was seen and reported that a good number of APL HHs have unauthorized connections through hooking. DISCOMs are reluctant to release more connections as they have to augment the transformer capacity in many cases.

Rajasthan has Villages consist of a number of small habitations (Dhanis) which may fall even outside the revenue Villages. Electrification of one Dhani was treated as electrification of a village and therefore VEI does not provide for full electrification of villages. The Government of Rajasthan is trying to introduce electrification of all the Dhanis. The 33/11 KV Substations are being built in Rajasthan to provide REDBs for a cluster of villages under RGGVY Program. However considering the growth of demand and a large number of Irrigation pump sets, the number of 33/11 KV Substations needed are much more.GOR is providing support for putting up 800 new 33/11 KV Substations (GSS).

11. Implementation and Quality of Infrastructure:

In a random check with the drawings it was found that village distribution infrastructure has been created more or less as per the DPR. Remote dhanis around Sample Villages (20-30 dhanis) are also electrified. Dali hamlets with 2-3 household are also found to be electrified. VEI Network is such all the

household of the villages could be accessed. A ring type network has been developed on a single feeder where required. It was observed that almost 20-30 % meter either not working or damaged or tampered. Transformers installed were found to be in good condition; but safety fuses were removed permitting over drawal. Five transformers out of 40 were upgraded from the capacity of 16 KVA to 25 KVA on burning of 16 KVA transformers. Probably two 160 KVA transformers were stolen resulting of availability of 40 Transformers instead of 42.

The rigorous three tier quality monitoring has worked but it took too long to implement their suggestions. The regular maintenance arrangement for the infrastructure was not evident.

12. Duration of Electric Supply experienced:

In terms of the responses received there is wide variation in supply available in villages. The experience of various households revealed variation from low of 2-5 hours to high of 18 hours in a day. Based on the Village Sample and households surveyed 63% households get more than 7 hours of supply of 17% get upto 16-18 hours of supply.

Different feeders can expect to get different periods of supply based on load management by DISCOMS. Ajmer, Chittorgarh and Hanumangarh are best placed where as some villages in Bharatpur are real sufferers. Consumers also play foul to cut supply of others. Supplies in villages during peak hours of evening are very poor. Kirana shop owners use traditional lighting of kerosene also although electricity supply is available. On an average supplies during day hours is in the range of 5 hours in an erratic manner.

In some villages issue of electricity gets into ugly turn when villagers struggle among themselves and manipulate electricity network to their advantage. Change in the location of the transformer had also been attempted. State governments must upgrade and strengthen the rural feeder with the twin objectives of achieving better quality of supply and loss reduction.

13. Billing and Revenue Collection and Disconnection

Under the RGGVY Programme, Franchisee were mandatory to ensure effective billing and revenue collection in Villages. In the surveyed villages it was found that 85% villagers receive the bi-monthly bills directly from the Discoms. Close to 11% of household did not receive any bills. It also should be noted about 1% Households received bills only 2-3 times in a year (in remote places). Remaining didn't receive bills. Many of these bills are without meter reading on average basis. Complaints of higher billing exist and

in this pretext many villagers do not like to pay the electricity bills. In some villages compliant was that bills were received for 2-3 months period when technical faults continued during this period.

More than 65% villagers were found to pay the electricity bills in a regular manner. They walk to a bill collection centre or camp organized by the Discom from time to time. Outstanding of some consumers was in the range of 500-2000 rupees. This was mostly seen due to the delay in issuing of initial electricity bills. This may result in disconnection. Close to 20% of the villagers do not pay bills in a regular manner. Many of them pay after the crop harvest period only. Villagers from remote place prefer to pay in aggregate manner. Some of the households gave the impression that under RGGVY Programme both connection and electricity is free for BPL consumers. It was found that charging of mobile phones is one of the most important requirements of electricity for the villagers. Villagers travel to charge their mobile phones to other villages paying Rs. 4 to Rs. 8 for hour of mobile charging

Disconnection of BPL households was not noticed in the Villages Surveyed. Risk of disconnection exists mainly due to theft.

14. APL Connections and Augmentation of VEI and REDB:

Even though in the Villages Surveyed the connections released to APL Consumers were slightly more than planned as per DPR (106/95), large number of APL households applications are pending. Many of them had applied for the connection before RGGVY has started.

The load demand of APL Consumers is much higher than BPL Consumers and as such release of APL Connections requires quantum jump in transformer capacity provided. The 16 KVA transformers (5 Nos.) got burnt and were replaced by 25 KVA.There is visibly urgent need to increase the transformers capacity provided in the villages of Rajasthan to meet the demand of APL Consumers.

Discoms in Rajasthan are receving large no of appalictions from APL Consumers to get electricty connection, but simply cannot release due to need of additional feeders and transformers. This is also giving rise to the theft of electricity due to its comfort value.

Decimals need to carry out an effective load assessment in the villages and augment the Generation, Transmission and Distribution infrastructure to feed the rapidly growing load demand in the Villages, as a consequence of RGGVY. It is very essential that proactive efforts must be made to develop a proper consumer mix in villages particularly bringing productive loads in the rural areas (small scale

commercial activities, agricultural load etc.) for long term sustainability of rural electrification. The central government may give financial support for bringing productive loads in the RGGVY villages. State governments (Government of Rajasthan) must develop a separate business plan for each distribution circle (may be drawn from the existing Rural electrification plans) for strengthening of 132 kv and distribution systems by taking in to account of the load growth for next 10 years. Financial assistance for this may be provided to by the Central government from case to case basis.

15. Socio-Economic Impact of RGGVY

In the Villages Surveyed the employment structure was as below among the surveyed families.

Agricultural Land Owners	-	247
Agricultural Labourers	-	216
NREGA employed workers	-	257
Skilled employed	-	4 (Jodhpur)
	-	8 (Ajmer)

No activity like shop/business, small scale industry or food processing was visible. Animal husbandry was a source of employment only in Jodhpur (14) and Ajmer (1) one person was getting Govt. pension and one person was factory worker.

In Surveyed Villages overall average income assessed was Rs. 48,667 Rs per year per household. Hanumangarh indicated highest average income of close to 98, 000 thousand per year per family where as Bharatpur and Chittorgarh showed very low income averaging Rs. 18000 and Rs. 27000 per annum per family.

In Chittorgarh district all the villages were seen de-electrified, and there was no electricity before RGGVY. In Chittorgarh all the villagers felt very positive about the impact of RGGVY. Chittorgarh mostly lies in forest areas, and therefore electricity during evening and night hours gives them a great sense of security.

In Ajmer, Jodhpur, Hanumangarh where electricity is better compared to Chittor and Bharatpur, even though villagers feel better after they started receiving more hours of electricity, but they have to earn more for to pay for the electricity bills.. Only in Chittorgarh families felt that income has increased. It is

probably due to the fact that female members got more hours to work in activities at home like weaving, tailoring, Kirana shop, and others.

On an average 65% household felt that it is more comfortable and secure to live in the village after the village got electrified. Only around 2 % respondents admitted that they got employment due to RGGVY, probably because they got work with the contractor to execute the RGGVY. Villagers mostly felt that NREGA increased their income.

About 10% of respondents got higher in income due to electricity due to the use of electricity in activities such as weaving, tailoring, running Kirana shop, and other household based small business activities. Some 31 % families felt that their health improved due to electricity due to some relief from intense heat during summer.

The awareness among the BPL families that they will get an electricity connection free of cost under RGGVY existed only in Hanumangarh. Few cases were found where BPL Consumer gave connection charges. On the contrary some BPL families did not pay for electricity assuming that electricity is also free because the connection was free.There seems to be the urgent need of creating awareness among villages about the availability of electricity due to RGGVY for which consumers shall have to pay to get economic benefits.

Electricity provides an opportunity to improve quality of Life. Appliances used in the sample villages included electric bulb (592 Nos.), Fan (197 Nos.), Computers (2 Nos.), Television (5 Nos.), Mobile phones (202 Nos.), Air Conditioner (1 No.), Electric press (3 Nos.), Refrigerator (6 Nos.), Heater (2 Nos.), Food processor (nil), and grain processor (3 Nos.) being used in Sampled Villages. Despite positive impacts it is observed that the current level of electrification is not enough to induce overall economic development in the villages, as envisaged in the National electrification policy. State Governments should create appropriate linkage and coordination between Agriculture/food and Electricity board so that DISCOMs/EDCs could help in the growth and development of Agro and food processing and other village level enterprise.

16. **Women empowerment and Electrification of Public Places:**

Almost all women felt that better management of home as one of the clear benefits of electricity. It helps them in cooking at night and provides more time during the day for other works. Out of 20 schools in sample villages, 9 were electrified. All school functions from 10.30 am to 4.30 pm. Of the other public

places like Temples, Community Centre and Panchayat, out of 12 Nos., Only one (1) was electrified. Some Temples were having unmetered connection. It was seen that out of the 22 unelectrified public places since 11 Nos., LT line is laid but final connection has not been released. 3 schools have filled application but waiting for the connection. In some schools appliances like fans, pumps are installed but the connection has not been released.

17. **Industrial activities/Commercial activities in the Villages**

In all the surveyed villages no industrial activities were found. However household level small activities were found like weaving, handcraft and other such SSI. One tailor has motorized his weaving machine in his tailor shop. There was no processing of milk because milk was being directly sold in these villages. Villagers did show interest in setting up SSI business but due to highly unreliable supplies were not willing to invest in spite of the availability of raw materials. Current level of rural electrification has to be intensified to expect economic growth, SSI investments and small business entities to grow as a result of RGGVY.

18. **Use of HVDS Distribution**

In the villages surveyed HVDS mode of distribution has been randomly used. Eleven (11) KV feeders are laid to convenient locations. 25 or 63 KVA transformer would be installed at these locations and connections will be provided through three phase LT lines. Use of LT bare conductors provides temptation for power theft which is very difficult to check even in short distances. Though HVDS 11KV lines are directly extended to as many points as possible thereby reducing LT lines and thus reducing losses and voltage drop, the size of transformers has to be selected (10, 16, 25 KVA rating) depending on the demand of the consumers or clusters of them. Three phase transformers are installed for industrial or agricultural consumers which are again of smaller rating to ensure that no more than three consumers in general are fed from one transformer. Any LT lines required are drawn using aerial bunched conductors (ABC) which cannot be tapped and possibility of theft is eliminated. But HVDS System poses cost problems as

- More maintenance is required.
- In case of failure of any equipment, replacement will be very costly.
- To some extent theft has been controlled due to HVDS, but theft due to by-passing the meter was rampant.

HVDS is especially useful for Irrigation pump sets, small scale industries, small domestic machines and water pumps.

19. Rural Electrification Plan and Policy

The rural electrification plan has been prepared by the government of Rajasthan, but it was not prepared within the six-month as per the National rural electrification policy and conditions of RGGVY Program. The rural electrification plan has been written on the template developed by the MOP. However it does not clearly speak about the O & M strategy/long term planning for RGGVY infrastructure, and clear policy on sharing subsidy burden. The EA-2003 aims at eliminating cross subsidization but RGGVY would require cross subsidization to be substituted by Government paid Subsidy.

Last year, GOR Gave Rs. 500 Crores as subsides but there is no specific budgetary support for RGGVY Tariff. There is specific provision for RGGVY consumer for revenue support. There is a need to make more concrete effort in these directions by the State Government and National Policies.

20. Decentralized Distribution Generation (DDG)

Rajasthan state has planned to electrify villages both through the extension of the grid and also through the non grid. It has planned to electrify 189 villages through non-grid method electrifying the villages as per the Rural Electrification Plan of the GOR

Name of the Discom	Villages to be electrified by Non-Grid
Jaipur Discom	40
Ajmer Discom	98
Jodhpur Discom	51
Total	189

Rajasthan plans to electrify 189 villages through a Non - Grid form of electricity. These villages to be electrified by non grid and the strategy to implement it, will be worked out by the Rajasthan government in collaboration with the RREC.

There is no operational DGG in the state; however it is stated that 2 DPR have been prepared for implementing DGG in Rajasthan. Two main reasons for delay in DDG 1) lack of clarity on ownership of the project 2) lack of incentives for entrepreneurs 2) poor operational revenue form the projects as highlighted by the entrepreneurs. 73% of the villagers showed their interest to have a DDG system in their villages while 27% said no, because they feel that DDG is not going to work properly and won't be able to supply enough electricity in villages. 54% villagers said solar technology was the best for having DDG in the villagers because it can be installed very easily on the rooftop of every household and also because solar resources are very good in Rajasthan. There is an urgent need to think of a proper institutional mechanism for make DDG into a reality. 58 % of the Utility officers and junior level employees said the entire approach towards DDG should be through private ownership and operator plants. If complete private ownership is not possible, then the operation and maintenance activities should be outsourced to private enterprises on a contractual basis for the operation and maintenance of the plant. 23% of the Discom employees believed that it should be via a PPP, but with a very clearly structured PPP mode.

Even though the experience and feedback on the existing DDG Scheme under RGGVY is still to be gained, a practical way of applying the DDG would emerge from the combination of the source of Power and paying capacity of Consumers. Alternative model of DDG Scheme which will require further detailing would be proposed in the main report of the evaluation Study. To overcome this Generation Based franchisee model and off-grid distributed generation franchisee model may be developed for rural energy under the existing DDG scheme through a competitive bidding process.

21. **Franchises deployed and likely Models**

The Overall Status of use of Franchisee in Rajasthan presents the following picture.

Total No. Of Villages	Village fully under RGGVY	Franchisee deployed As of 31.3.08
41353	4420	35

In the 25 Villages Surveyed there was no deployment of franchisee. However the distribution of bills prepared by DISCOMs were being distributed to Consumers by private agencies in 18 villages out of 25 samples villages in Rajasthan. The respective discom has started the process of deployment of Franchisee in 15 of the Sample Villages.

Spot billing order has been issued for 12 Districts Franchisee for spot billing are working in Alwar, Dholpur and Karauli in Rajasthan. Financial feasibility of franchisee system to serve rural areas is still to be established. In some cases Discom was not able to award the franchisee as price quoted was very high (Re bidding is being done). However in many villages even without Franchisee the billing and collection system is remarkably good. The Franchises are not coming up due to the Poor Hours of Supply, Poor Consumer Mix, Scattered Villages (low density), lack of accurate benchmark and baseline data, commercial dispute due to contractual obligations, and lack of the financial feasibility of franchisees in rural areas. A hybrid model with combination of Discom and Private Parties such as spot billing, and distribution of bills, where collection still remains with the Discoms hand is being considered in Rajasthan. Options like economic mobile van based billing and collection could be considered.

22. Roles and responsibility of Different Stakeholder:

The clarity on the roles and responsibility is very clear at the top level like at the MOP, REC but when it goes to the lower level of implementation, due to institutional structures there is overlapping of responsibilities there by creating ambiguity in smooth implementation of the RGGVY. MOP and REC has the over all responsibility of implementing the RGGVY as per its objectives. To large extent MOP and REC are able to fulfill their responsibility although BPL connections released are still around 60% of the total state target.

As far as GOR (Government of Rajasthan) is concerned there are more specific responsibilities has been signed to the GOR. The GOR has formulated his rural electrification plan and has notified it. However it was within the six months of the notification of rural electrification policy. Most of the surveyed villages GOR have been able to give a minimum 6-8 hours of supply of electricity. Deployment of Franchisee in rural areas is very poor which is very important for the revenue sustainability of the rural electrification.

Availability of authenticate BPL list was a big problem initially, however through proper intervention by district authority it has been sorted our largely. GOR Rajasthan also supposed to carry out a lot of awareness programs regarding RGGVY; however from our survey we have observed the level of awareness about RGVY is extremely low. In some cases due to this ignorance villagers has paid money for getting the electricity connection. In some villages people are of the view that both BPL connection and

electricity use is free under this scheme. Due to this wrong understanding the entire village is not paying the electricity bills. Much more effort needs to be done to create awareness about the program. There should public notice in the villages explain the salient features of RGGVY should be put in. There is no separate/specific subsidy provision from the GOR for BPL electricity consumption. REP of Rajasthan is 115 crores of Indian rupees. There should be specific budgetary provision for subsidizing the BPL consumers.

23. **Suggestions/Recommendations for effective implementation of RGGVY:**

(i) RGGVY implementations have been very good in terms of creating a high quality of distribution infrastructure in Rajasthan however there is good scope for further improvement in terms of better quality of service delivery. Create separate rural electrification department in each Discom to bring focus towards the implementation of rural electrification. Since already a huge amount of rural distribution infrastructure has been created, a specific and appropriate plan should be prepared by the State Government for the maintenance of infrastructure**.** Sustainability of rural electrification is the bigger concern as many villages do face the risk of de-electrification in the future. A rural electrification fund should be created by a joint contribution from the Centre and the State to primarily fund the operation & maintenance and systematic improvement of the rural distribution infrastructure that is created under RGGVY. It can be linked to the National Electricity Fund. For smoother implementation and effective monitoring, Ministry of Power may constitute an Independent RGGVY monitoring Committee oversee the implementation in 12th plan. Strengthening of Rural Electricity Infrastructure (more no of 33/11 KV SS) to provide connection to the remaining households (both APL and BPL). In 12th plan infrastructure should not be designed, only to meet the need of the BPL but also should meet need of APL. Augmentation of the network, backward linkages (may be separate feeder); inclusion of productive loads should be taken-up in the next plan for agriculture and commercial activity.

Chapter-1

RGGVY and Background of the RGGVY Evaluation Study

RGGVY program

Rajiv Gandhi Grameen Vidyutikaran Yojana (RGGVY) was launched, with the Rural Electrification Corporation (REC) as the nodal agency, by merging all the ongoing schemes in April' 05. The program funding was comprised of 90% grants by the Government of India, excluding the amount of state or local taxes, and 10% by the State Government through own resources or a loan from the REC/ financial institutions.

Implementation period in state

The Rajiv Gandhi Grameen Vidyutikaran Yojana Scheme of Rural Electricity Infrastructure and Rural Household Electrification was continued in the XIth five year plan for attaining the goal of providing access to electricity to all households. Within the Plan, electrification of about 1.15 lakh un/de-electrified villages and electricity connections to 2.34 crore BPL households by 2009, with provisions for capital subsidy of Rs. 28000 crores during the plan period, was decided.

RGGVY was to be finalized by the state Government to provide in advance the sanction first instalment of project cost, and guarantee for a minimum daily supply of 6-8 hours of electricity in the RGGVY network and assurance of meeting any deficit in this context by supplying electricity at subsidized tariff as required under the Electricity Act. Most of DPRs were made in 2005 and were sanctioned in 2005 or 2006 as well. The projects were approved in between 2005-2008.

Objectives to achieve:

RGGVY aims at providing Rural Electricity Distribution Backbone (REDB) with 33/11 KV (or 66/11 KV) sub-station of adequate capacity and lines in blocks where these do not exist. Village Electrification Infrastructure (VEI) for the electrification of un-electrified villages (under the new definitions), electrification of UN-Electrified habitations with a population over 100 and the provision of distribution transformers of appropriate capacity in villages/habitations, Decentralized Distributed Generation (DDG) systems for villages based on conventional or renewable or non-conventional energy sources (sources such as biomass, Bio-fuel, bio gas, mini hydro, geothermal and solar etc.) where grid supply is not feasible or not cost effective.

RGGVY aimed at:

- Electrifying all villages and habitations as per new definition
- Providing access to electricity to all rural households
- Providing electricity connection to below poverty Line (BPL) families of charge.
- Maintaining separate records for BPL, SC/ST populations.

Objectives of evaluation study

There are a number of parameters associated with these main objectives to give a comprehensive evaluation of RGGVY in the state of Rajasthan.

- Study the progress of village electrification as per the approved DPR, including revised DPRs if any, and verify village electrification as per the definition of village electrification in terms of coverage and quality coverage (having various parameters).
- Study the socio-economic impact of village electrification under the scheme with respect to standard of living, education, health, employment opportunities etc. All the schools and health centers should be covered, in case non-availability of Health Centre in the village, nearby health center should be surveyed,
- Study the role and responsibilities of all stakeholders under the RGGVY program and assess whether these roles and responsibilities have been undertaken by the respective state holders i.e. to assess clarity of role of stakeholders.
- Suggest methods for better and effective implementation of RGGVY.

Chapter-2

Brief on RGGVY Implementation in Rajasthan (10^{th} and 11^{th} Plan)

Implementation targets achieved

As per the earlier definition of village electrification, a village was considered electrified if it had electricity supply, for any purpose whatsoever, in the inhabited locality within the revenue boundary of the village. This definition was changed under RGGVY. Consequently, a village would be declared as electrified, only if basic infrastructure such as Distribution Transformer and Distribution lines are provided in the inhabited locality as well as the Dalit Basti hamlet where it exists. Electricity should be provided in public places like Schools, Panchayat Office, Health Centers, Dispensaries and Community Centers etc.

The number of households electrified should be at least 10 per cent of the total number of households in the village (table – 2.1). The Performance of RGGVY during the Tenth and Eleventh plans is given in Table 1.

Table 1 Village electrification under RGGVY during X and XI Plan

State/UT Name (Total No. Of Districts)	. Of DPRs	5 Year Plan	Project cost Sanctioned (in Rs. Cr.)	Awarded cost/Revised cost (in Rs. Cr.)	Total Amount Released (in Rs. Cr.)	Electrification of Un-/De-Electrified villages		Intensive Electrification of Electrified villages		No. of Connections to BPL Households	
						Coverage in No.	Achievement in No. (%)	Coverage in No.	Achievement in No. (%)	Coverage in No.	Achievement in No. (%)
RAJASTHAN (32)	5	10th Plan	453.23	533.47	402.92 75.50%	1705	1645 (96.5%)	15608	14931 (95.7%)	699951	489139 (69.9%)
	5	11th Plan	801.26	760.11	497.77 (65.5%)	2749	2235 (81.3%)	19233	13143 (68.3%)	1E+06	508812 (48.5%)
		Others		0	0		0		0		0
	0		1254.5	1293.6	900.69 - 69.60%	4454	3880 (87.1%)	34841	28074 (80.6%)	2E+06	997951 (57.0%)

The total progress in Rajasthan so far is shown in the Table-1. There are 32 districts which are being covered under RGGVY both in 10th and 11th plan, in which 40 DPRs had been prepared. From the Table, the issue of cost revision is noticeable. The amount that was released within the plan was only 69 % of the awarded costs or the revised cost. Also, there was a steep cost escalation in the projects implemented in remotely located villages and villages having multiple Dhanis. It was observed that because of the larger village structure with large no of Dhanis it is not possible to electrify the villages with the standard set by REC of 13 -18 lakhs per

village. Because of this it does have an impact on the releasing the BPL connection which combined both the plan is around 57% only. The less achievements in BPL connection are due to the combination many factors such as co-ordination issues between different agencies, improper project management and financial issues. There are many other constraints at the field level in the execution of RGGVY projects and the implementing agencies face difficulties in resolving issues relating to timely award of contracts, availability of contractors, supply of material, availability of BPL lists, forest clearance, way-bills, allotment of land for sub-stations, safety against theft, particularly theft of transformers and electric wires and rendering of village electrification certificates by Village Panchayats, etc. Regarding the BPL connection in some cases the contractor with some assurance from Discom, has released more BPL connection, but final amount is not released to the contractor. The final closing the 10th Five Year Plan is still being carried out by the REC CPM offices. The cost norms for the projects under RGGVY should take into account the Rajasthan State specific conditions. The study therefore arrives at the conclusion the cost norms for village electrification should be revisited by the REC and suitably modified taking into account the local conditions in the terrain and areas in the Rajasthan States where electrification has to be carried out. The existing cost norm for electrification of un-electrified villages in normal terrain (Rs.13 lakh) and in hilly, tribal & desert areas (Rs. 18 lakh) and the cost norm for intensive electrification of already electrified village in normal terrain (Rs. 4 lakh) and in hilly, tribal & desert areas (Rs. 6 lakh) . However being Rajasthan a scattered area some flexibility must be incorporated regarding the cost norms for carrying the village electrification.

The latest revised costs of rural electrification are as follows.

	Cost Norms	
	Pre-revised	**Revised**
BPL Household Electrification	**Rs. 1500 per connection**	**Rs. 2200 per connection**
Electrification of un-electrified		
In normal terrain	**Rs. 6.5 Lakh**	**Rs. 13 Lakh**
In hilly, tribal, desert areas	**Rs. 6.5 Lakh**	**Rs. 18 Lakh**
Intensive electrification of already electrified villages		
In normal terrain	**Rs. 1 Lakh**	**Rs. 4 Lakh**
In hilly, tribal, desert areas	**Rs. 1 Lakh**	**Rs. 6 Lakh**

Only 57% of BPL connections have been released in the Rajasthan state. It is due to fact that some cases number of BPL household present in the village is more than the 10% of the village household. To electrify the

entire BPL household will be difficult because of financial constraints. So while sanctioning a rural electrification project, REC should especially examine these villages and the feasibility of 100 per cent electrification of BPL households to obviate different type of problems relating to electrification of BPL households.

It was observed that because of large village structure, those with a great number of Dhanis, it is not possible to electrify the villages with the standard 13 -18 lakhs per village set by REC. Subsequently, this significant shortfall had an impact on the number of BPL connections released, which combined in both the un/de-electrified villages and Electrified Villages, stood at around 57% only. This low achievement in the number of BPL connections is due to the combination of many factors such as co-ordination issues between different agencies, improper project management and financial issues. In certain cases, the contractor due to an informal assurance from the Discom, released more BPL connections than financially viable, and then the final amount due to them was not released. The final closing of the 10th plan is still being carried out by the REC CPM offices.

Figure 1 A remote village in Rajasthan, having no road is surveyed by IRADe Team

Status of village electrification in state:

The village – wise physical and financial achievement for the 10th and 11th Plan under the RGGVY are presented in Table-2. Within the Jaipur Discom in 10th plan, there were 358 un-electrified villages and 4021 electrified villages. There were 120866 BPL Families to whom a total of Rs. 12640.47 lakh was disbursed. Amongst the six districts in this Discom, the lowest number of BPL families was in Karouli (78) and

the highest in Alwar (4200). The disbursements were also decided as per the number of BPL families in each district. In the Ajmer Discom, the number of un-electrified villages was only 4 in Chittorgarh but the number of electrified villages was nil. A similar situation was observed in Udaipur. In this Discom, there were 309 un-electrified villages in the 10th plan and 4180 electrified. The numbers of BPL families were 122464, who were accorded a disbursement of Rs. 9416.83 lakh on the basis of the number of BPL families. In the Jodhpur Discom, the highest number of un-electrified villages was recorded in 10th plan (760), with 148975 BPL families and a disbursement of Rs. 10441.05 lakh. In total, for the 10th plan, including the Bhilwara and Jhalawar power grid, there were 1647 un-electrified villages and 14931 electrified ones in Rajasthan. The total disbursement to the state was Rs. 40327.65 lakh. The similar information for these Discom in the 11th plan is also given in the lower half of this Table.

The situation in the 11th plan improved to the greatest extent. In total, 141346 BPL families were covered under a total disbursement of Rs. 22233.35 lakh. Combining the 10th and 11th plan, the numbers of un-electrified villages were 2240 while the electrified villages were 13303. Overall, 517040 BPL families benefited from the Rs. 49460.59 lakh disbursed under the RGGVY within the two plans.

Table 2 Status of Village Electrification in the State of Rajasthan during 10th and 11th Plans

S.No.	Name of Project /District	Implementing Agency	Un-Electrified Villages (Nos.)	Electrified villages (Nos.)	BPL	Disbursement
10th Plan Projects						
1	Dholpur	Jaipur Discom	162	0	1759	1372.06
2	Karauli		9	0	78	92.5
3	Kota		38	691	25169	1341.74
4	Bundi		68	662	22464	1819
5	Alwer		47	1853	42000	4923.04
6	Dausa		34	815	29396	3092.13
	Sub-total (10th plan)		358	4021	120866	12640.47

7	Chittoaurgarh	Ajmer Discom	4	0	58	6.55
8	Udaipur		46	0	52	87.5
9	Jhunjhunu		0	787	9494	930.81
10	Ajmer		14	921	18835	1944.48
11	Sikar		13	884	14368	1457.4
12	Rajsmand		132	834	43607	2471.48
13	Dungarpur		100	754	36050	2518.61
			309	4180	122464	9416.83
14	Hanumangarh	Jhodhpur Discom	46	0	3133	133.71
15	Jaiselmer(AREP)		55	0	35	181.06
16	Ganganagar		111	0	4000	409.01
17	Jaiselmer		98	322	7094	1149.16
18	Bikaner		180	587	30744	1860.33
19	Sirohi		8	447	8246	963.64
20	Jalore		30	667	36589	1806.17
21	Jodhpur		173	885	21198	2392.73
22	Churu		6	843	35298	1457.65
23	Nagour(ps ladnu)		0	97	2638	87.59
			760	3848	148975	10441.05
24	Bhilwara	Power grid	104	1589	49530	3725.34
25	Jhalawar	Power grid	169	1293	45827	4103.96
	Sub-total (10th plan)		273	2882	95357	7829.3
	Grand total		1647	14931	487662	40327.65

Project wise Achievement of Un/DE, Intensive villages and BPL State: Rajasthan

S.No.	Name of Project /District	Implementing Agency	Un-Electrified Villages (Nos.)(8+16)	Electrified villages (Nos.)(9+17)	BPL	Disbursement
11th Plan Projects						
1	Dholpur	Jaipur Discom	46	96	4111	776.88
2	Jaipur		45	1742	38839	1939.72
3	Karauli		46	434	33105	1276.44
4	Tonk		140	836	19369	1631.3
5	Swaimadhopur		69	595	28580	1411.47
	Sub-total (11th plan)		346	3703	124004	7035.81
6	Banswara	Ajmer Discom	309	604	47638	5443.74
7	Udaipur		255	1279	80376	6123.04
8	Chittoaurgarh		195	1817	60334	4948.16
	Sub-total(11th plan)		759	3700	188348	16514.94
9	Hanumangarh	Jhodhpur Discom	132	525	28300	1634.39
10	Ganganagar		152	620	35042	2042.1
	Sub-total(11th plan)		284	1145	63342	3676.49
11	Baran	Power grid	82	647	18161	1580.75
12	Pali	Power grid	15	913	36808	2496.63

13	Bharatpur	Power grid	95	1217	35693	3083.16
14	Nagaur	Power grid	25	1228	39667	3135.2
15	Barmer	Power grid	634	750	110017	11937.61
	Sub-total(11th plan)		851	4755	141346	22233.35
	Grand total		2240	13303	517040	49460.59

Trace process of developing DPRs: -

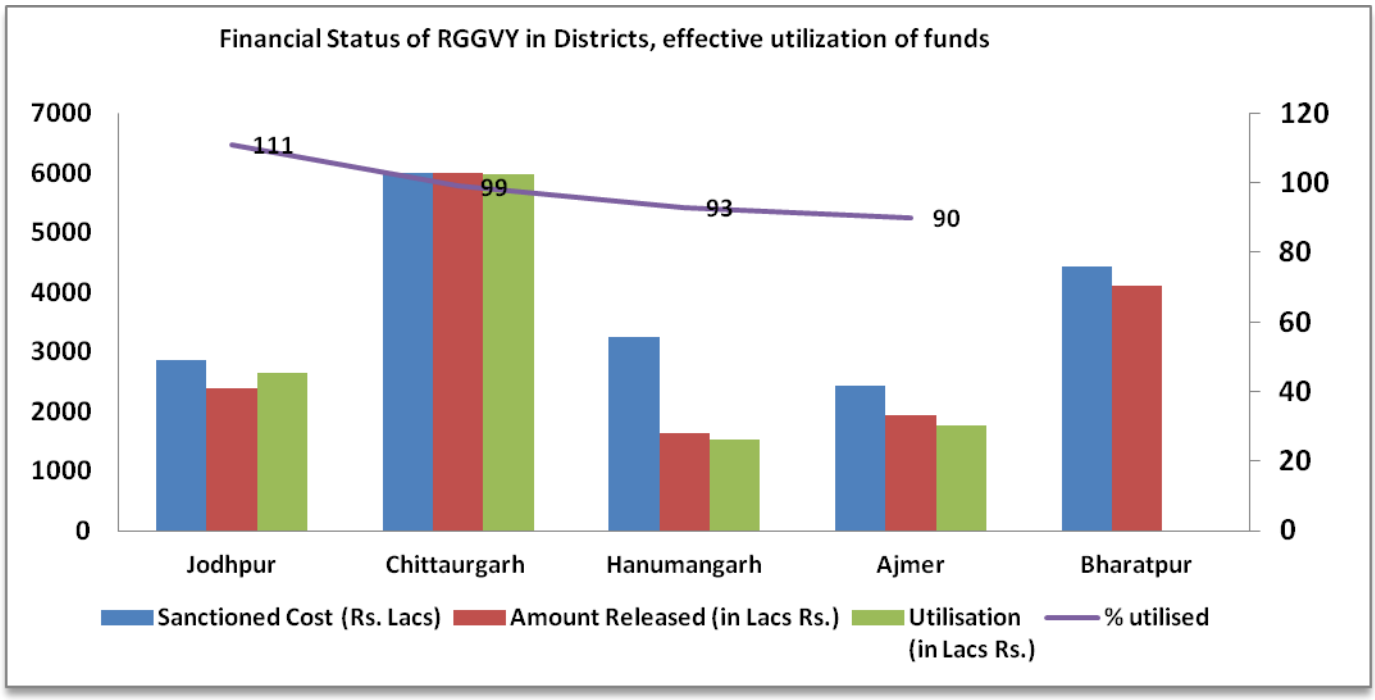
The DPR preparation process was not done rigorously. While it is very difficult to prepare an adequate comprehensive DPR within a small time, several were prepared in a hurry, some even in less than a month.

Villages are very often carried out for conducting the assessment of load and future demand. Due to this it is very difficult to design a system which is capable of catering to the demand of the consumers. Generally, the DPR format that is created by the REC is sent to different officials, and they are told to fill the format. For example, if some village or block level details are required and have to be collected, the concerned Junior Engineer and the line man fill out the format and send it to the higher officials and this practice is mostly followed, and in the end, all this data is compiled and put in the REC DPR format and sent to the REC, CPM office in Jaipur.The REC, CPM office analyzes the DPR; conducts some field visits and does necessary correction if required in consultation with the DISCOM. Then REC, CPM office forwards the same to REC corporate office for the approval.

Sound assessment and effective utilization of funds:-

The utilization of the money released was found to be very effective in terms of putting the village distribution infrastructure. However, in terms of releasing BPL connections, it is observed as mismanaged in certain villages while in few others you find a 100% success rate in issuing BPL connections.

Figure 2 Financial Status of RGGVY in Districts, effective utilization of funds



In the Chittaurgarh, Hanumangarh and Ajmer districts, close to 90% of the money have been utilized. In Jodhpur more money has been spent than the amount released to the district's Discom. This overshooting of funds is largely because electrification of highly scattered population requires greater resources, as is the case for connecting the remote households in the Jodhpur area.

Chapter-3

The approach and Methodology used in village survey and interactions to evaluate the effectiveness

Methodology:

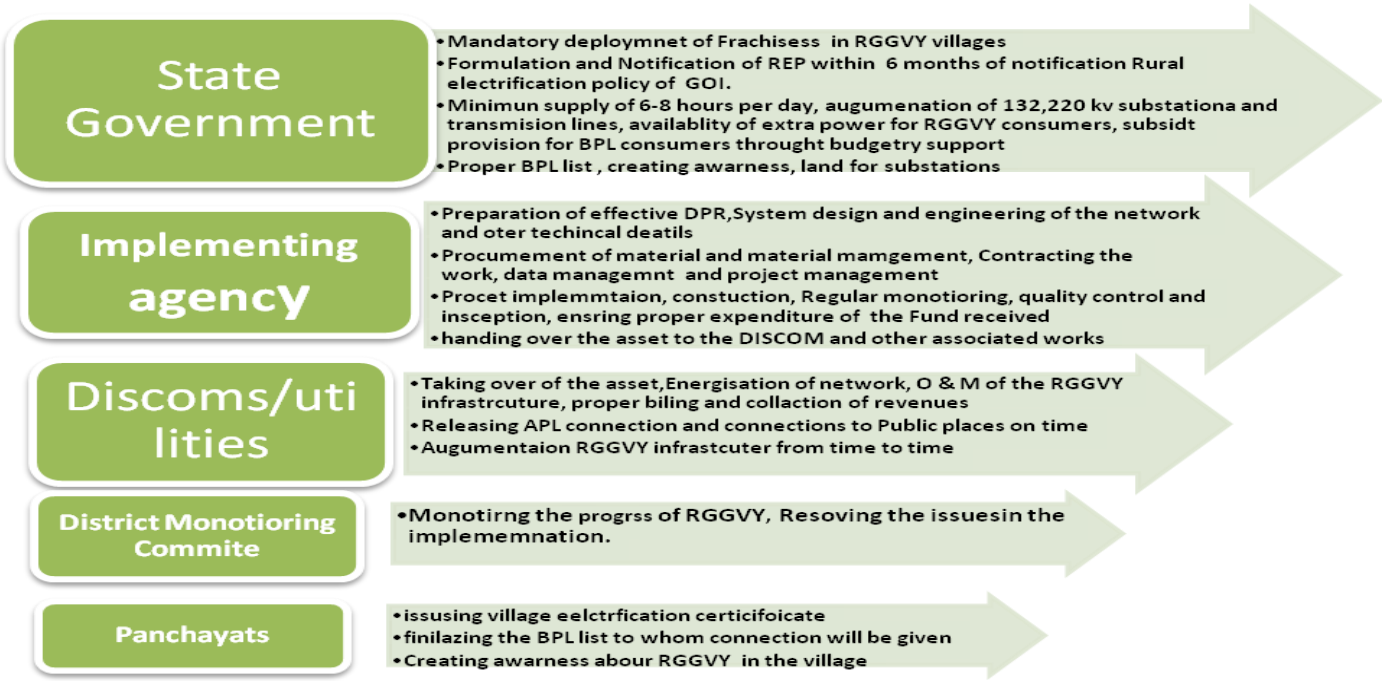
The methodology followed was a combination of surveys at the village level, meetings, interviews and consultations with senior and junior officials from different agencies. Also, focused group discussion with the villagers, the distribution utilities, the state government energy departments and all the stakeholder groups involved were conducted.

The survey was done on the basis of random sampling of villages. A total of 25 villages was selected across five different Districts of Rajasthan. In each district five villagers were selected across five different blocks of the district. A detailed and Structure questionnaire was developed for conducting surveys in villagers after consultation with REC.

Stakeholders identified and their role:

There are a large number of stakeholders involved in Rajasthan for the implementation of RGGVY, starting from the village level to the Ministry of Power itself. However, here we will discuss the role of those stakeholders who were more closely involved with Rajasthan like the State Government of Rajasthan, the Discoms, the District monitoring committee, the village panchayats and other such parties. The role of other stakeholders like the Ministry of Power, and the REC will be analyzed in the chapter dedicated to role and responsibilities. The responsibilities and roles of different agencies are shown in the figure below.

Figure 3 The Functions and Roles of Different Agencies involved in the RGGVY scheme, Rajasthan



Sample villages surveyed in the block / district:

Evaluation of the implementation of RGGVY was undertaken in five districts of Rajasthan, namely, Jodhpur, Ajmer, Hanumangarh, Chittorgarh and Bharatpur. In these districts, one block was selected and one village in each of these blocks was identified for the study. A format was devised to collect the basic as well as the people's perspectives to evaluate the implementation of RGGVY particularly with reference to BLP families. In this report a consolidated picture is presented on the impact of this scheme within these 5 districts.

Table 3 Sample villages surveyed

	Surveyed villages	
Name of District	**Name of Block**	**Name of village**
Jhodhpur	Balesar	Chimangarh
	Bap	Jesari(Not surveyed)
	Luni	Mori(Satlana)
	Phalodi	fatesagar
	Shergarh	Sadulpura(Meghwalo ki dhani)
Ajmer	Bhinay	Soorajpura
	Jawaja	Dewal fatehpura
	Kekri	Dholai

	Peesagan	Gigal pura
	Arain	Laxmipura
Hanumangarh	Bhadra	9JGW(not survyed)
	Hanumangarh	1PBM
	Hanumangarh	6MDA
	Nohar	1 RMG
	Nohar	Rekh ghariasar
Chittorgarh	Harnod	Depura
	Begun	Ratanpura
	Chotisadri	sakriya
	Chittorgarh	Phusariya
	Pratapgarh	Borwana
Bharatpur	Rupvas	Ranpur
	Nagar	Jatoli
	Kama	Maroli
	Bayana	Ghunaini
	Kumher	Nagla Moti

Design of questionnaires for village survey and stakeholders:

A detailed questionnaire was designed to capture the views of village households. This was prepared in consultation with the REC and the MOP. A highly specific, separate questionnaire, interview guide and meeting agenda were also designed to capture the views and suggestions of different stakeholders. Focused group meetings /discussion and public consultations were also organized within villages.

Figure 2 (left Photo) IRADe Team is Conducting Focused group discussions with Villagers , Right Photo- Door to Door survey is conducted by the Team

Chapter-4

Results of village surveys and interaction with Stakeholders

Evaluation of APL/BPL households:

In all, 2153 families in the identified villages were identified, and from these, 638 BPL and 1515 APL families were listed as per the DPR. There was a provision for 100% BPL electrification in the DPR .Out of the 638 BPL households, 365 households had been electrified i.e only 57%. Regarding APL connections, more connections had been released than the feasible estimates as 106 households were found electrified as opposed to the target of 95 RHH. This has been shown in Table-4. Whereas around 10-20% APL households had been surveyed, all the BPL households were covered within the study.

Table 4 Evaluation of APL/BPL households

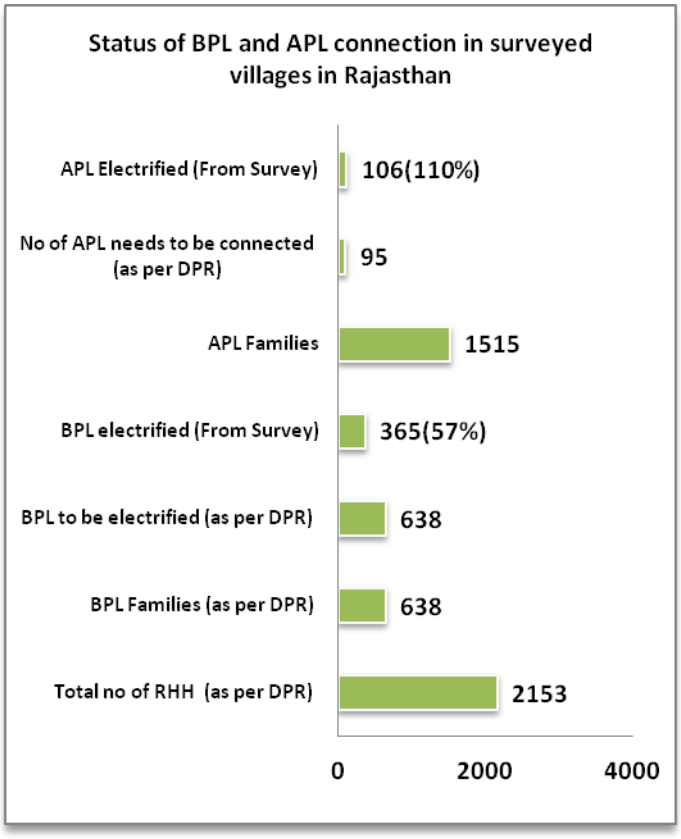
	Total no of RHH	BPL Families	BPL HHs Electrified	APL Families	APL needs to be connected	APL HHs Electrified
JODHPUR	907	175	29	732	53	38
AJMER	536	249	55	287	0	25
HANUMANGARH	69	17	14	52	0	8
CHITTOR	325	142	190	183	18	35
BHARATPUR	316	55	77	261	24	0
Total	2153	638	365	1515	95	106

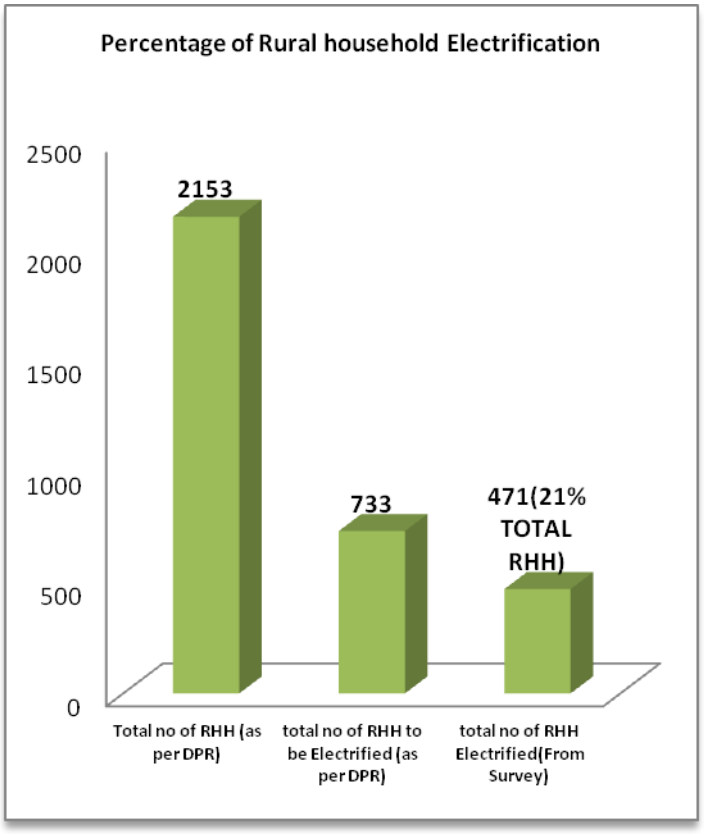
Status and Progress of Village Electrifications:

In all the 25 surveyed villages of Rajasthan, as per the DPR, 638 BPL connections were to be released- out of which 365 BPL connections had already been released, which is more than 40% below the targeted number of households. On the contrary, more than the required numbers of connections as per the DPR were released among the APL families. While the DPR stated a goal of providing connections for 95 APL households, an additional 11 households were found electrified in the village survey. The reason for this mismatch/anomaly was due to the fact that even before RGGVY, many APL villagers had already applied for their electricity connection. When the RGGVY was implemented, APL households were quickly electrified, whereas BPL households fell behind; due to the large time it took to identify these households in the villages. Also there were delays in getting the BPL household list from the local authorities, which also created hindrance for expediting the release of BPL connections.

In Rajasthan, in many cases the villagers live in many sub-villages (Dhanis) of the revenue village and not in the revenue village itself. Electrical connections to all the Dhanis were initially limited as RGGVY only allowed one Dhani to be electrified. Latter this problem was resolved due to efforts by the Government of Rajasthan, as it also runs parallel schemes to electrify households in Rajasthan.

Figure 3 Status of BPL and APL connection in surveyed villages in Rajasthan and Percentage of Rural household Electrification





Eventually, out of the total 2153 households (BPL+APL), only 21 % of them had been electrified through RGGVY. There are still a large number of rural households left out who should be electrified in an accelerated manner to sustain the progress of rural electrification. By the current definition of village electrification, there have to be a minimum of 10% village household which is electrified. If the left out villagers are not electrified in a progressive manner, then cases of electricity theft might increase substantially and infrastructure overload

might occur causing significant damage, since the current capacity of the infrastructure will not be able to meet the demand.

Although progress of APL connection can be seen as very good in Rajasthan, the progress of BPL connection is acutely behind schedule or plan. It was also observed that because of a large number of sub-villages in Rajasthan and the widely scattered population, it is not possible to reach out the entire BPL households with the existing financial standards (Rs 13-19 lakhs per village) for village Electrification.

REDB and VEI in villages surveyed:

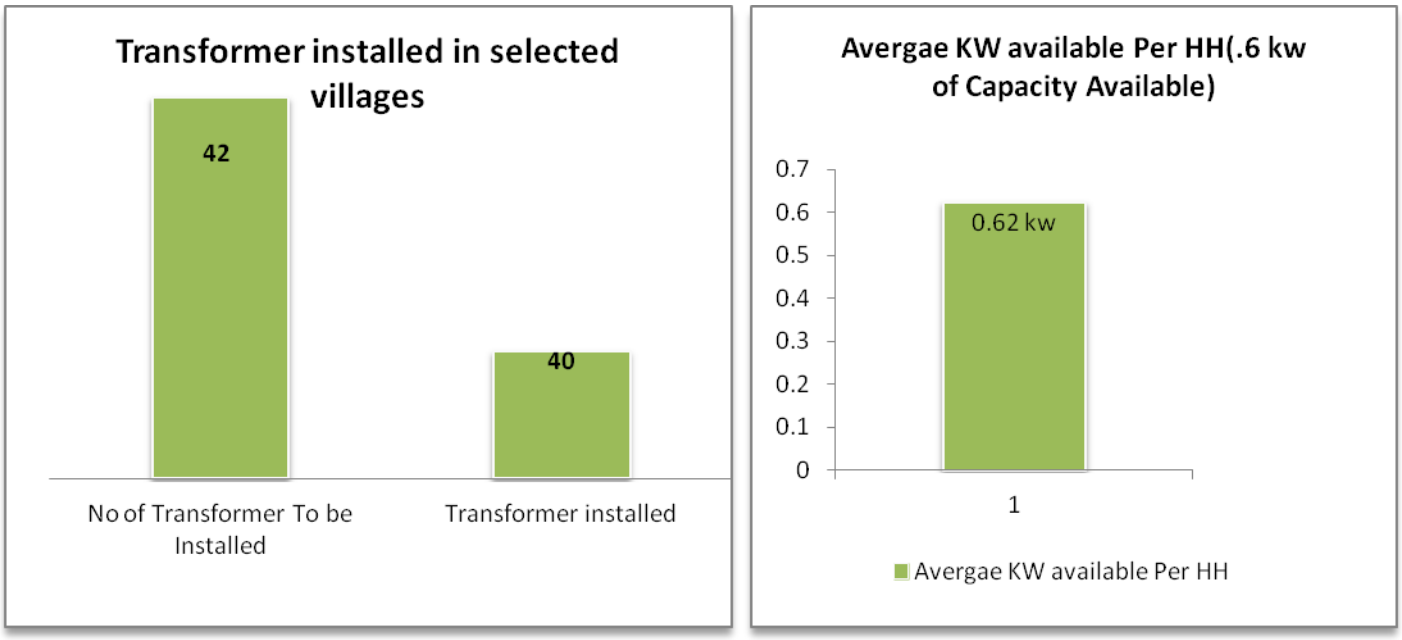
In most of the surveyed villages the RGGVY project has been executed properly as per the DPR, particularly under the Ajmer Discom. Coverage of Village Electrification Infrastructure (VEI) was found to be commendable as many remote Sun villages or Dalit Hamlets are also been electrified. Although VEI was designed to electrify only one sub village of a revenue village, in Rajasthan, many sub villages are also being electrified as households in the villages are very much scattered in the Rajasthan. Also the large number of BPL households is also living in the sub villages which must be electrified as per RGGVY.

The transformer is the most crucial equipment in village electrification infrastructure. In most of the districts, DPR is prepared by taking an assumption of 1KW of household demand which is good enough to carry the load of APL households. BPL household actually demand much lower than the 1 kW demand assumed. It also has the capacity of giving connection to water pumps of 5 HP (nearly 9.4 KVA) in certain villages, since rural electrification also aims to enhance the economic activities in the villages by improving the quality of life of villagers. In the village surveyed, as per the DPR, 42 transformers of 16 KVA needed to be installed out of which 40 transformers had already been installed. If we take a power factor of .7, then all the transformers combined, can manage a load of 457 KW, which comes to around .6 KW per household*[1]. The survey shows that the average load of households (both APL and BPL) comes to around .5KW (may be more as one household is often connected to many other households) which is less than the available capacity of .6 KW. Although by this calculation we can see that the transformer is adequate enough to cater to the demand, there were nevertheless a large number of transformer failures due to the overloading. This corroborates the fact that there are substantial numbers of households without an official electricity connection, who get themselves unauthorized connections to the Village Electrification Infrastructure and start drawing power, creating a huge

[1] *Not included the Water pump demand as these are practically not available in villages except very few.

pressure on the transformer. This fundamentally highlights the fact that the current definition of village electrification i.e. Minimum 10% rural household electrification needs to be relocated. On an average there are around 30 to 40 % unauthorized connections in these villages.

Figure 4 Transformer installed and Average KW available Per HH



Although in the sampled surveyed villages the available transformer capacity is quite good, if we take a look at the total transformer capacity available district wise, then the average kW capacity available in all the five districts surveyed is around 0.2249 KW (assuming transformer operates at full load and CUF is 100 percent- though practically it will be lesser) which is much lower than the village level average of .62 KW. Also, 0.2249 KW is only for BPL households. If we include the APL household numbers this might reduce the KW capacity of households even further.

In the Gigalpura Village in AJMER augmentation took place after the transformer got burnt whereas APL connections were released without Augmenting. It is an Electrified Village- No infrastructure was proposed, many villagers already had connections. But village Got De-electrified due to transformer failure, later Transformer of 16 KVA was installed and later it failed.

No of HH	No Of BPL CONNECTED	No of APL Connected	Transformer Capacity 25 (Initially 16 kva)	Transformer Capacity Available (KW)	Average watt/HH	Total Demand of village in KW
75	1	65	16	12.8	300	16.5
75	1	65	25	20	321	17.6

Transformer Capacity 25 (Initially 16 kva)	**16 KVA (Initial)**	**25 KVA (After 1 year)**
Average connected load (watt/HH)	**300**	**321 (7% growth)**
Transformer Capacity Available (KW)	**12.8 not adequate (assuming .8 P F)**	**20 better adequacy**
Total Demand of village in KW	**19.8**	**21.1**

- Detailed and continuous load assessment of Villages should be carried out for both BPL and APL before electrification for the village not yet electrified and within 1- 2 years of village electrification for the village electrified. It can be done through the help of local people and the village youth. It should be a regular exercise. After doing the proper assessment capacity of the Transformer should be augmented if needed.

- Maintenance of the transformer also should be carried out in a regular manner. Although during the survey almost all the transformer is in good condition , however they might face failure in future due to lack of adequate maintenance.

Figure 5 left Photo - A transformer damaged, Right Photo- Transformer protective device are removed by the villagers due to the frequent tripping due to overloading.

Table 5 REDB District wise

	Already Electrified	Un - Electrified	De - Electrified	No. Of Connections to BPL Households	No. Of New33 KV Substations (Capacity in MVA)	No. Of Augmented 33 KV Substations (Capacity in MVA)	No. Of DTs (Capacity in MVA)	Total KVA CAPACITY	Total KW available (* 0.85 PF)
AJMER	1011	9	5	31223	0	0	788 (12.60)	12060	10251
Bharatpur	1267	27	72	41821	0	0	1195 (19.53)	19530	16601
Jodhpur	885	125	48	30365			1180 (18.88)	18880	16048
HANUMANGARH	1576	46	132	78132	0	0	627 (10.57)	10570	8985
CHITTAURGARH	1977	0	207	125862	0	0	1269 (20.30)	20300	17255
Total	6716	207	464	307403	0			81340	69139

- **Average KW available per BPL household is =69139/307403=0.2249 kW**

Under RGGVY a large number of electrified villages (6716) are receiving more connection, thereby creating a massive surplus demand which is not met due to lack of supply, infrastructure access and others reasons.

Although as per the design assumptions the transformer capacity is appropriate, but for sustainability of infrastructure, and reliability of power supply, a proper assessment of the existing load on the system should be carried out and if necessary, the transformer capacities should be immediately augmented by the utilities before the transformer gets burnt or damaged. Even at the planning level a broader definition of village electrification should be thought, which may possibly look at more than 50% household connections as the minimum requirement to declare the village as electrified. There is a need to look at the condition of village electrification which was implemented in the 10^{th} and 11^{th} plan and a proper review of available utilities should be carried out village- wise and appropriate action should be taken if needed. All the details of the villages connected to RGGVY infrastructure should be uploaded on the website of every Discom/utilities with the help of a separate MIS system. It also should give information about billing and collection of revenues of each RGGVY consumer.

Under RGGVY, no 33/11 KV Substations are being built in Rajasthan in the selected districts, although there is a large requirement for constructing these new substations. It was observed that through the GoR's own scheme, GPVVY, it is also putting new 33 KV GSS. The scheme aims to build 800 new 33/11 KV substations

The growth is agriculture, commercial and domestic loads in the rural areas will require strengthening of existing infrastructure and also for providing quality power supplies to rural areas of Rajasthan. This will require segregation of agricultural and rural feeders, conversion of the LT network to HVDS system, argumentation of transformers etc. The Rajasthan government, through their own funding support and also with the support from the Centre, is running certain schemes in the direction to strengthen the system, like Feeder Renovation Program and others.

Table 5 Planned Creation of Sun-Transmission infrastructures in the State

Details	Cost	2008-2009	2009-2010	2010-2011	2011-2012	Total
REDB and VEI under RGGVY (as per the DPR)	1081.35 Cr.	490.11 Cr.	253.06 Cr.			
Strengthening of existing substations, rural infrastructure by the GOR	2007-2008	2008-2009	2009-2010	2010-2011		
No of 33 KV LINES	1449	1711	1495	1505	1185	7345
No of 33 KV SUBSTATIONS	195	260	200	205	165	1025
No of 11 KV LINES	14055	35200	29800	17350	15500	111905
No of 11/0.4 KV LINES	65390	103000	74000	55000	47500	344890

It seems that the Rajasthan government has taken aggressive steps to strengthen the system which has shown results in places like Ajmer and other districts. A supply of 16-18 hours of electricity are available in the villages of Rajasthan. The success of RGGVY depends on these complementary schemes run by Rajasthan government and the process should be sustained till all the villages are electrified.

Backward linkages to the grid network to supply electricity to rural households was observed to be adequate in most of the villages, expect few villages whereas as there is an issue of overloading of line during evening hours is experienced. All the surveyed villages have backward linkages. Government of Rajasthan has also implementing GPVVY (Gram Panchayat Vidyut Vitarana Yojana), in which it plans to have one substation in each Panchayat and separate 11 kW feeders from these substations to the villages. The program aims to spend 2900 Crore spending in 3 years. This program run by government of Rajasthan (GoR) to build 33/11 KV substation in each Panchayat has helped with overall strengthening of the system. Discom and Transmission company themselves have taken steps to build more lines, so as to strengthen the network capacity. There is a need to conduct a detailed assessment of this infrastructure that is created against the potential demand on these systems due to the RGGVY. However, the GoR also has to draw a plan for maintaining this infrastructure as it is crucial to utilize the full lifetime of this infrastructure.

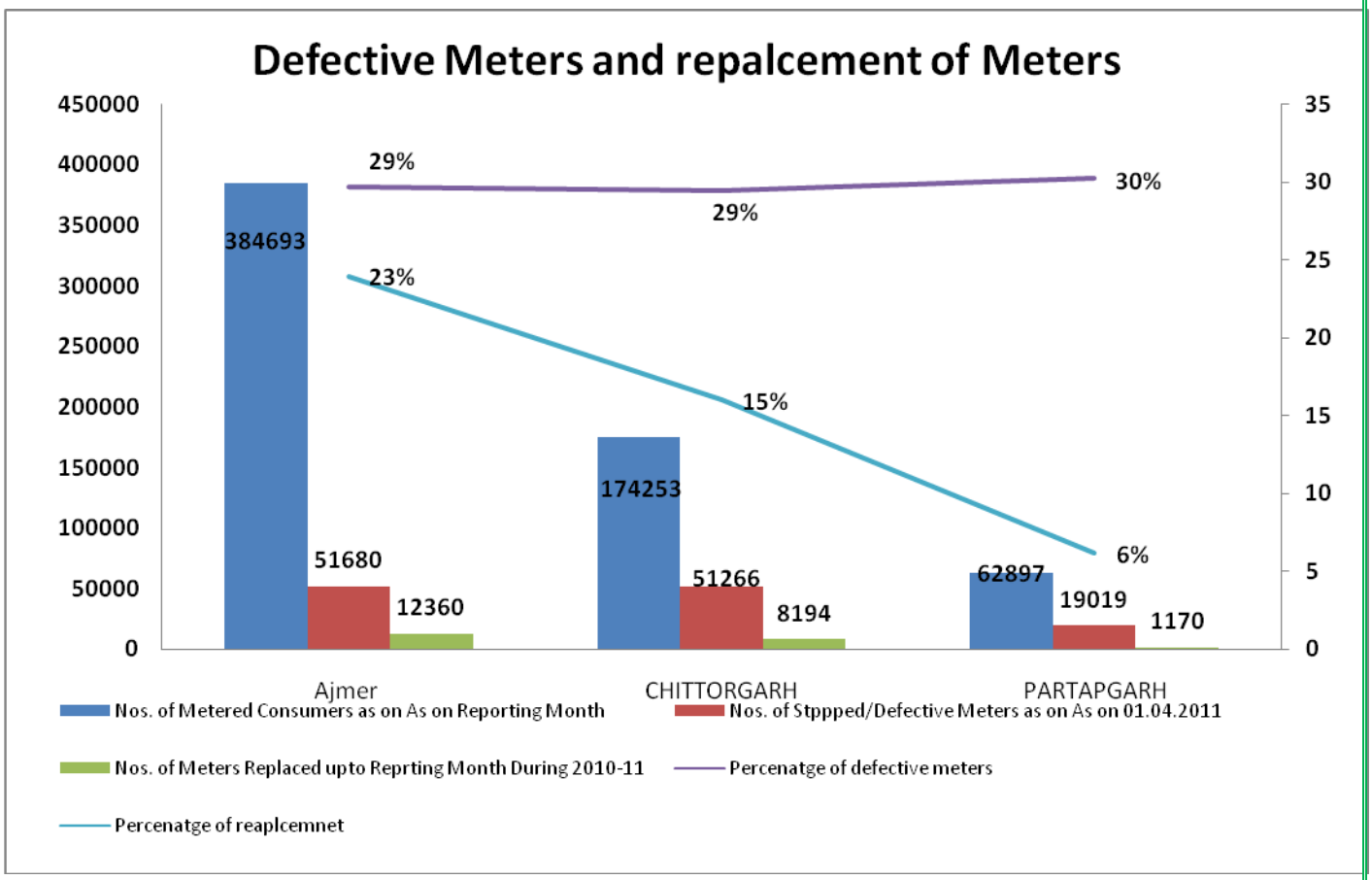
Quality of infrastructure created and quality of Coverage:

Village infrastructure was inspected as per the drawings and it was found that the village distribution infrastructure has been created in accordance with the design and proposal. There is an extensive three tier quality control is followed in the entire implementation of RGGVY. Due to this multi-layer quality monitoring, the quality infrastructure created in the villages is very good expecting few cases. During the interaction with the Contactors it was observed that because of extensive monitoring standards, the contractors are very serious about the proper workmanship; execute the work in a highly qualitative manner. Certainly this not the same in all the districts of Rajasthan and also varies from one contractor to the other. The quality of the infrastructure is very good in the surveyed villages; except for a few cases where a structure had not been installed properly. Remote dhanis (20-30 dhanis approximately) were also found to be electrified. Even Dalit hamlets with 2-3 household were found to be electrified. The quality of coverage of household by creating distribution infrastructure was found to be very good. The network was laid out in such a manner that it could provide connections to all the households of the villages. In those villages having a scattered population, a ring type

network had been developed on a single feeder. The condition of the meter in several villages however, was not very good. In many cases, the meters were either not working or damaged due to various reasons like physical damage, technical failure of the meters etc. It was observed that almost 20-30 % of the meters was either not working or damaged or was found to be tampered with. The condition of meter in many villages is not very good. In Many villages meters are either not working or damaged to due to various reasons like physical damage, technical failure of the meters etc. It was observed that almost 20-35 % meters either not working/damaged/in tampered Condition in the village surveyed. Meters are also not installed in the proper location in the house. There are lots of materials found to be damaged.

Figure 6 Left Photo- Meter damaged, right Photo- Meter installed in the Kitchen of the House and has damaged the meter.

Figure 7 Meter installed in the back side of the House in the open, leading to damage of the meter, Right Photo- Meter Installed in a Tree.



In the three districts the defective meters found are in the range 29-30 % in each district which is under Ajmer Discom. The percentage of change of meters or replacement or repair meters is very low. In Ajmer district 29 % faulty meters get repaired. In Chittorgarh and Pratagarh only 15% and 8% of meter gets repaired/replaced respectively.

All the Transformers installed were found to be in good condition; however in most of the cases the fuse had been removed. Five transformers had been upgraded from the capacity of 16 KVA to 25 KVA as the earlier 16 KVA transformer got burnt due to overloading. Transformer theft and relocation is also a big issue- in two cases villagers reported that their transformer had been stolen from the village.

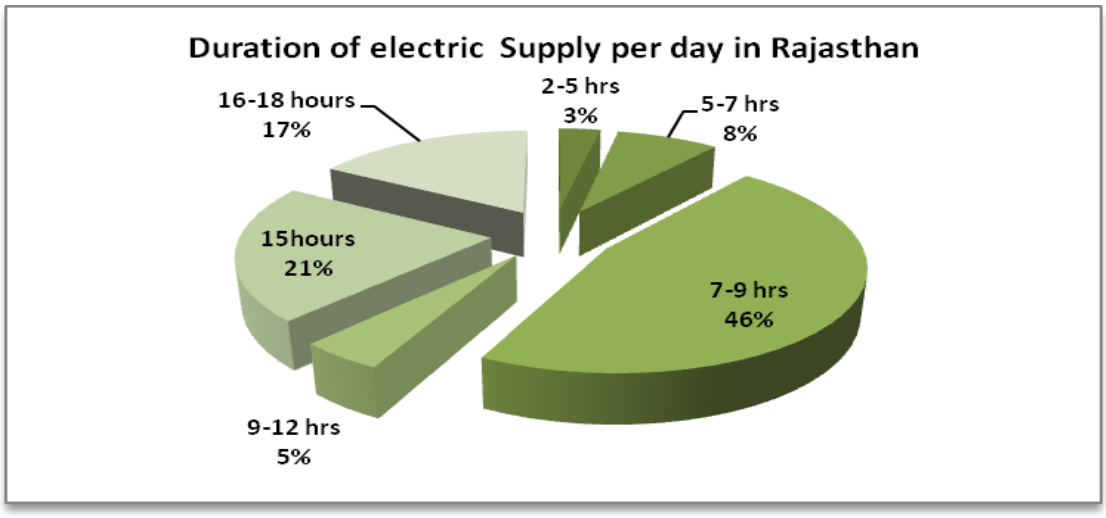
The rigorous three tiered quality monitoring has really helped in installing infrastructure of high quality. But this was not done in a timely manner. There were cases where it took almost 4 -6 months for the Discom to implement the suggestion made in the inspection by the inspecting authority. There is a long process which is followed to take necessary action by the Discoms which are very much time consuming and must be optimized to speed up the process of implementation.

Although it was found that the RGGVY distribution infrastructure was in an excellent condition, even after 2-3 years of electrification, but because of the very poor and adhoc approach towards maintenance of the systems, the life of the system network might decrease in future. It is very essential to devise a proper plan for maintaining the RGGVY infrastructures in a proper manner.

Duration of electric Supply per day in Rajasthan:

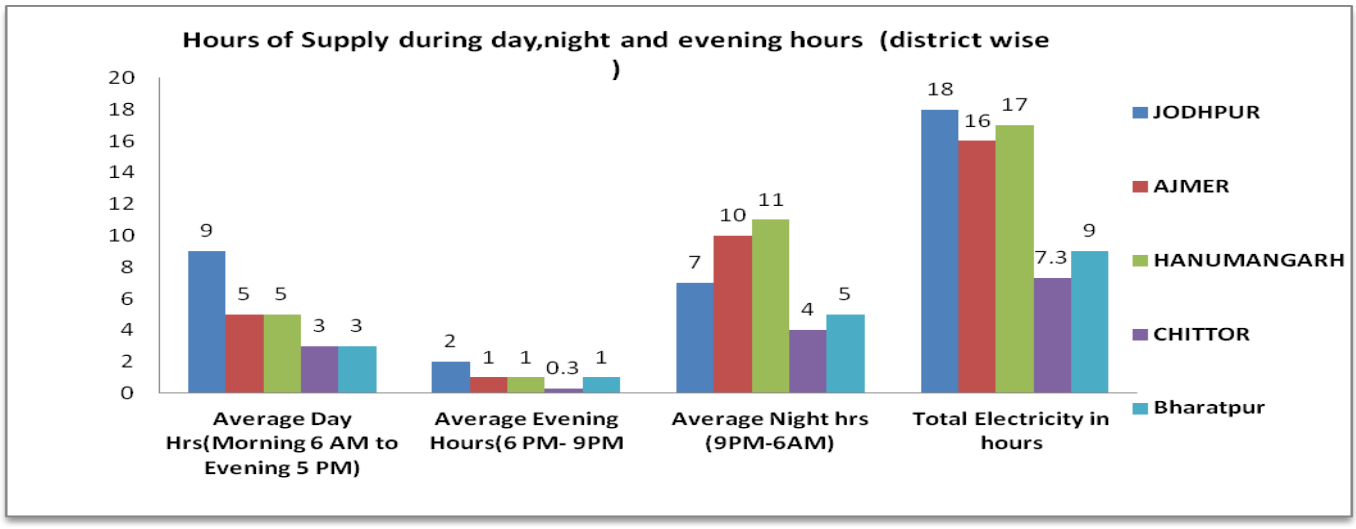
There is wide variation in terms of electricity supply available to villages in Rajasthan. It varies from a minimum of 2-5 hours to as high as 18 hours of supply. The number of hours supplied in all the surveyed villages in Rajasthan is shown in the pie chart below. The majority (46%) of the villagers got 7-9 hours of supply while around 17% of them got 16-18 hours of supply.

Figure 8 Duration of electric Supply per day



This however is only in the Ajmer, Choittorgarh and Haumangarh areas. Some villages of the Bharatpur area were receiving very few hours of electricity- in the range of 2-5 hours. Mostly the remote Dhanis of the main village received less electricity. Also in some villages, two Dhanis got different hours of supplies- sometimes because of different feeders for a single village, while sometimes on the same feeder also as some villagers cut the supply to rest of villagers.

Figure 9 Hours of Supply during day, night and evening hours (district wise)



Evening hours supplies were found to be very poor across all the districts of Rajasthan. The villagers demanded 2-3 hours of electricity during evening hours. Jodhpur receives maximum 2 hours of electricity during evening hours. Chittaurgarh received minimal hours of electricity of around 30 minutes during evening

hours. This was mostly due to the fact that the villages are very remote, where the electricity supply is not adequate enough as network capacity is limited during the evening hours of peak demand. In many districts, electricity was not supplied in a continuous manner even during the evening hours, with 2-3 power cuts within the three hours from 6 PM to 9 PM. Such erratic supply makes it very inconvenient for the villagers and they are unable to use electricity productively. One kirana shop owner reported using the traditional lighting which utilizes kerosene as fuel, although there is electricity supplied in his shop.

Also, the supplies available during the night hours of 9 PM to 6 AM ranged on an average from 7-10 hours. Villagers generally do not find any utility of these supplies during night hours. Supplies during day hours were in the range of 5 hours which is very less as villagers are likelier to use electricity during day hours.

So, as a whole, although a villager in Rajasthan gets adequate supplies, these hours of supply are not fixed (time of supply) and are very erratic, particularly in those areas where villagers gets 7-9 hours of electricity on a daily average. Villagers assert that the unreliable supply of electricity is no use to them as they cannot plan to do any productive work. A continuous nature of supply is very essential to have the sustainability of rural electrification. In some villages, issues of electricity governance have taken an unexpected turn as villagers struggle among themselves to get electricity by cutting supplies to different Dhanis of the village and by manipulating the electricity network for their own use. Villagers sometimes also change the location of the transformer as per their benefit and convenience.

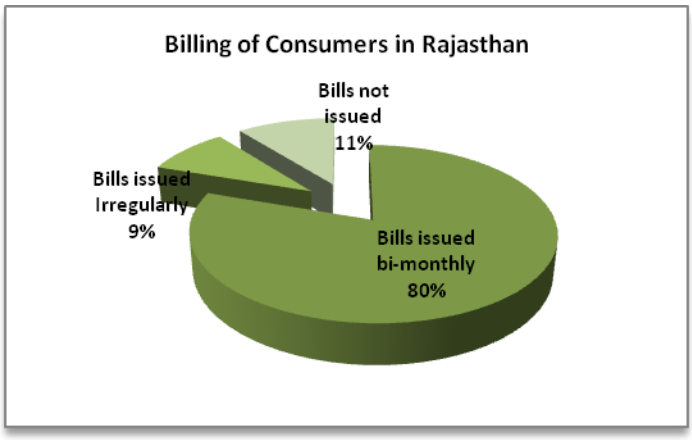
It needs to be ensured by the Discom that a proper and effective Supply scheduled should be prepared for rural areas and if in any case there is a change in the scheduled supply hours it should be communicated to the villagers /Sarpanch / Pradhan . It can be communicated directly to villagers as well. A minimum 6-8 hours of supply needs to be guaranteed specifying the time of supply as otherwise, there is not much utility for the villagers. There should be a minimum 2-3 hours supply during evening hours.

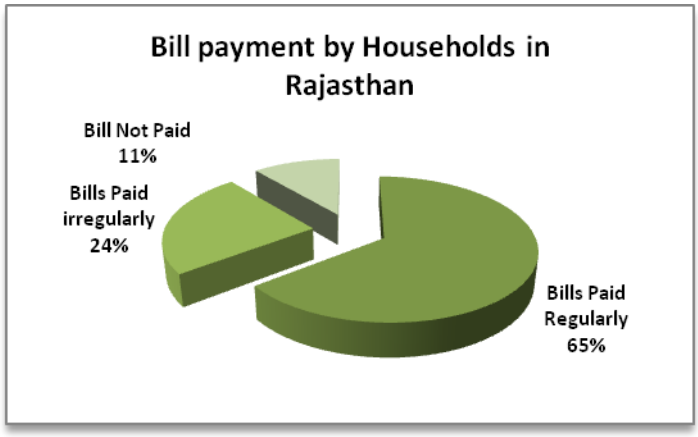
Figure 10 Due to Erratic Supply the villagers to keep their appliances on (even during day hours), just to know when the electricity is coming, thereby increasing wastage of electricity.

Billing and Revenue collection of RGGVY consumers :

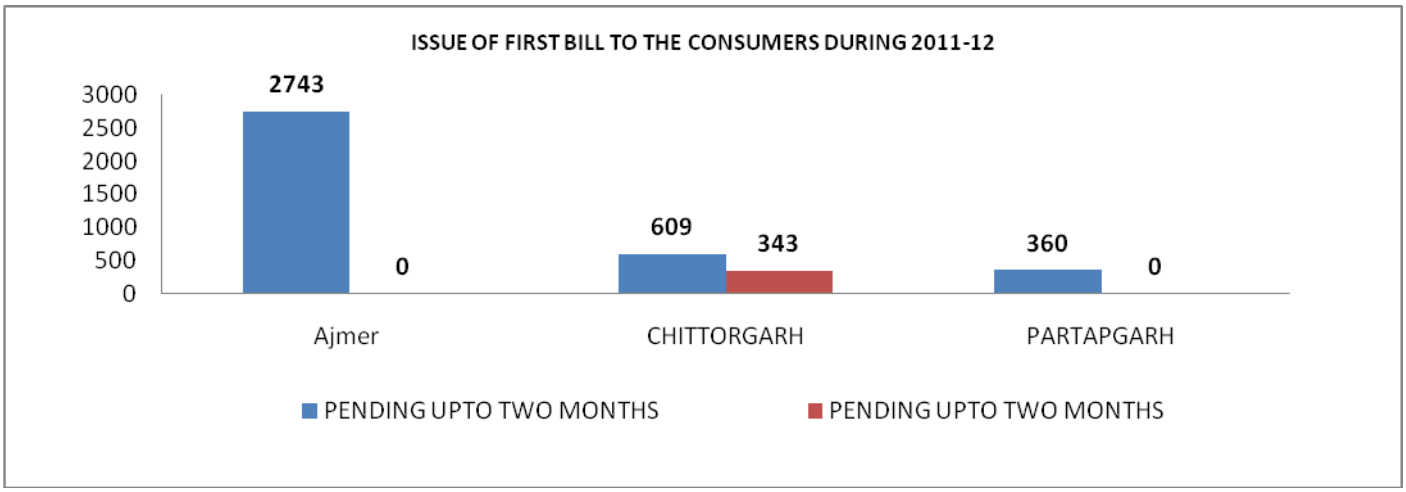
For revenue sustainability and also for the sustainability of the infrastructure, it is very important to properly bill all the RGGVY consumers and also collect the bills from them. Although it was envisaged to make it through the deployment of franchises, they did not come up in RGGVY villages. Under this context, it is very important to understand to what extent the billing and collection is taking place in the villages. In the surveyed villages it was found that 85% villagers received the bills from the Discom in a bi-monthly manner.

Figure 11 Billing and Revenue collection





Around 9% percent of the villagers received bills in a highly irregular manner, only 2-3 times in a year. In most of these cases these consumers were located in remote sub villages. There were even villages which had not received a single bill also. Close to 11% of households had not received any bills. It should also be noted that although many people were receiving bills bi-monthly, it took almost 4-6 months to issue the first bills. Also many of the bills were issued on an average basis and proper meter reading based billing was not done. This created a lot concerns among the villagers/consumers that they were getting bills amounting to much more than what they were consuming. Because of these reasons many villagers did not like to pay the electricity bills. In few villages it was found that although electricity was not available for 2-3 months, because of technical difficulties, they still continued to receive bills. There is a grave need to improve the billing quality and make it more realistic. It also should be noted that although many people are receiving bills bimonthly but it took almost 4-6 months to issue the first bills. As per the data available from the Discom only in chittoragrh 343 none cases where first bill has not been issued more than 2 months.



In Bharatpur area issuing the first bill is a big concern.Also many of the bills are issued on average basis and proper meter reading based billing is not done. This has created a lot concerns among the villagers/consumers that they are getting bill which is more than what they are consuming. Because of these reasons many villagers do not like to pay the electricity bills. In few villages it was found that although electricity was not available for 2-3 months because of technical difficulties but still they continue to receive bills. There is a need for improving the billing quality and make it more realistic. It cannot be done in an adhoc manner. Also there is a need to create awareness about the procedure of billing of electricity to the villagers.

It cannot be done in an adhoc manner. Also, there is a need to create awareness about the procedure of billing of electricity to the villagers.

More than 65% villagers paid the electricity bills in a regular manner in Rajasthan. They generally walked over to a bill collection centre or camp which was organized by the Discom from time to time. Although the bill payment was very good, the number of consumers with outstanding bills is also very high, with sums in the range of 500-2000 Rupees. This was mostly due to the delays in issue of initial electricity bills which eventually came as an aggregate for the entire period at the end, making it very difficult for the households to pay these huge bills. It is imperative to solve this issue of large outstanding bills lest these households face the risk of getting disconnected. It may be done by consulting with the villagers and apportioning the sum with the monthly bills. Close to 20% of the villagers did not pay bills in a regular manner. They mostly paid after the crop harvest period when they had the money to utilize. Also due to the remote location and the cost going to the collection center every two months, the villagers from remote places preferred to pay in an aggregate manner. 11% villagers did not pay electricity bills. The reasons for non-payment were mixed- due to the lack of money; not wanting to pay for it and others. One of the reasons given by a village in the Chittaouragh district of Rajasthan was that nobody paid the electricity bills because they thought that under RGGVY, both the connection and the electricity was free for them. This was communicated to them by the person who gave them their connection. It is very important to let them understand that electricity is not free from this assumption resulted in a lot of unauthorized connections in the village. It was found and observed during the interaction and survey that villagers preferred paying their bills rather than getting disconnected. They realize the importance of electricity and its need in their lives. For example charging mobile phones is one of the most important requirements for electricity. In villages where there was no electricity or very less electricity, villagers travelled to other villages to charge their mobile phones, even paying 4-8 rupees per hour for just charging the mobile

phones. This indicates that the quality of billing and collection should be improved for the sustenance of RGGVY.

Disconnection of BPL connections -

Total 16 connections had been disconnected in Rajasthan state, out of which six were disconnected due to theft of electricity when the vigilance team visited the villages. The remaining 10 households were disconnected due to physical damages to the house, mostly due to the flood and other natural disasters.

Figure 12 Dis-connection of BPL connections

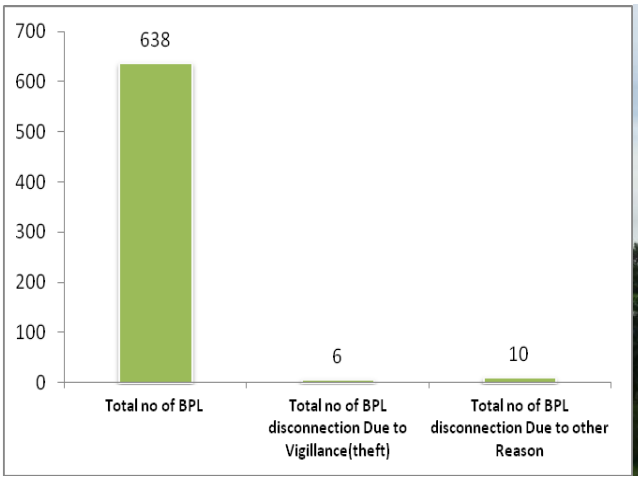


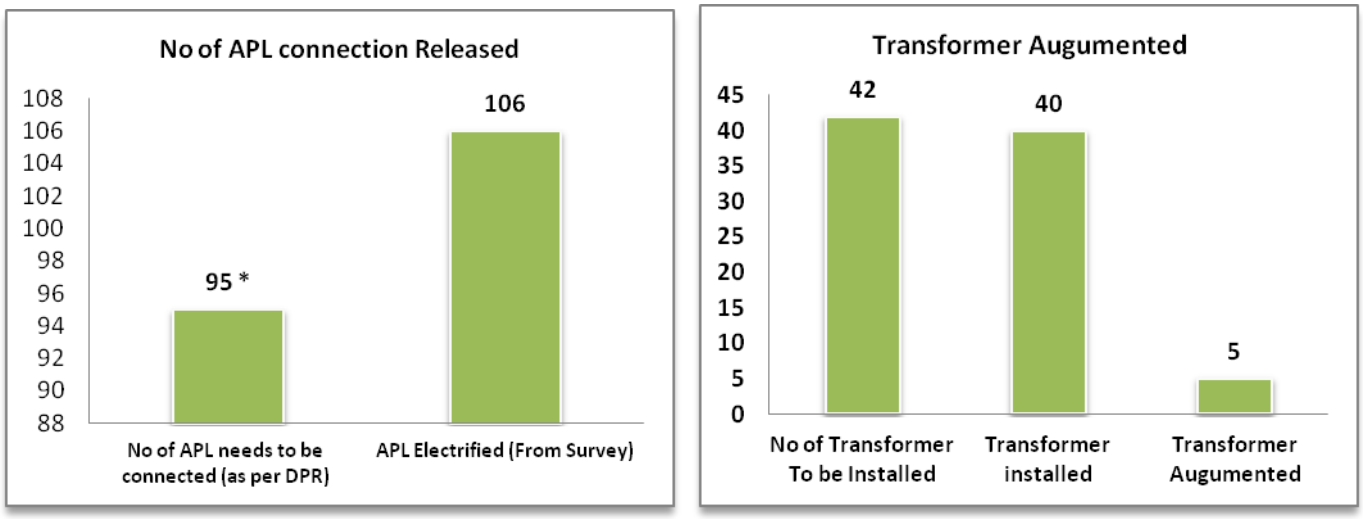
Figure 12 Right Photo- Hooking is on during the day hours,

However a large number of consumers faced a huge risk of disconnection as their outstanding bills were very high. Although people did pay electricity bills, their consumption was very high, leading to large outstanding bills. Also, physical disconnection was also likely expected, since in many cases meter are not installed in a proper place, and in many cases outside the house.

APL connections and augmentation of infrastructure

APL connections released in the surveyed villages of Rajasthan were more than what was assumed as per the DPR. 106 APL connections have been released as opposed to the 95 decided within the DPR. It was found that a large number of villagers have applied for the connection before RGGVY has started in the village. Once infrastructure got installed and commissioned, very quickly APL was released as proper BPL list was not available in the village at that point of time.

Figure Error! Bookmark not defined. **APL connect and infrastructure augmentation**

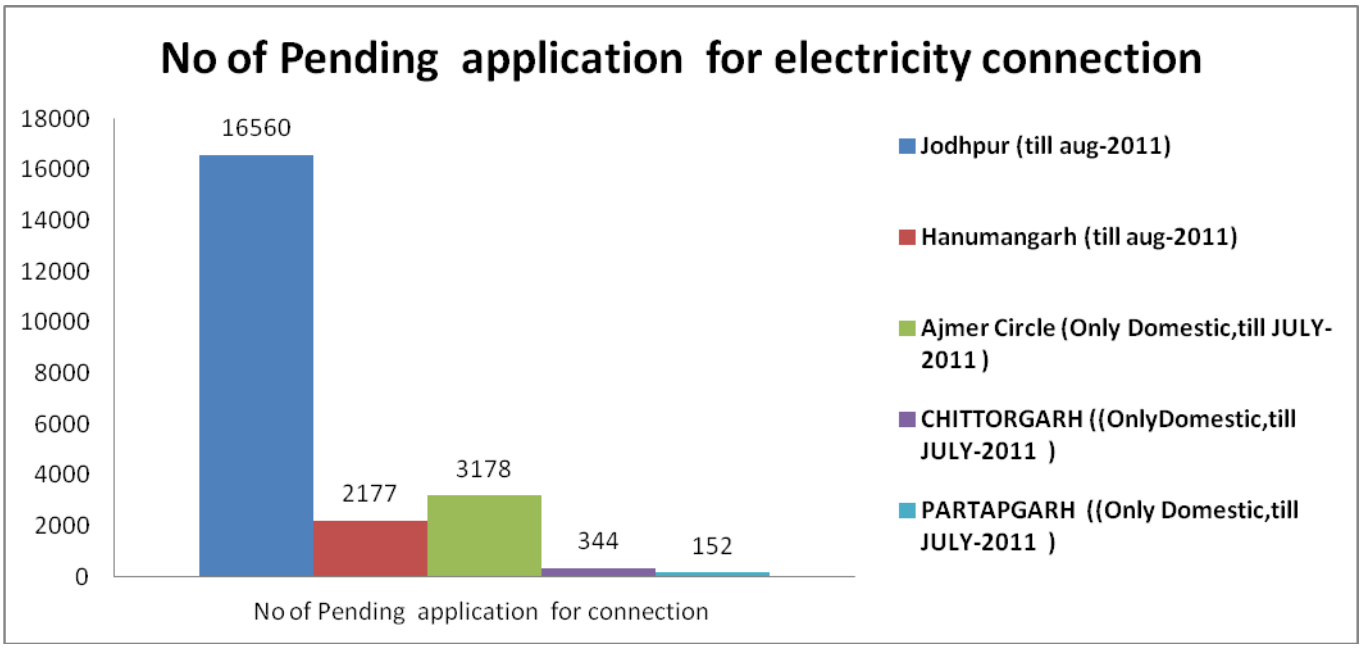


*In some DPRs, the APL number are not available, so it has been assumed as zero.

The release of APL connections continues, but the transformer capacity was not augmented regularly. More than 5 transformer's capacity were increased from 16 KVA to 25 KVA, but only after these transformers failed. There are very few cases of transformer augmentation in a proactive manner; most of the argumentation was in reaction to the failure or burn-out. Currently, the majority of the transformers is facing an overload crisis because of the high demand from APL consumers and also due to theft. Most of the transformer failures were due to the overloading. In most of the cases, the fuse had been removed, and when the transformers collapsed, it caused a huge financial burden in replacement, since it cannot be properly repaired.

RGGVY has helped in releasing more APL connections in Rajasthan but as a large number of APL families are still waiting to be connected, the transformer capacity needs to be very quickly augmented. Here, despite the large number of applications for an electric connection that the Discoms are receiving, they simply cannot release more as it might overload the transformer. They wait for the transformer to be augmented which also takes a lot of time. Due to this circumstance, villagers who do not get connected, get connected to the RGGVY infrastructure in an unauthorized manner, thereby creating more load on the existing transformer. It was found that on an average, an APL household uses electrical appliances accumulating a total load of around 0.8 kW to1. 5 kW. It varies from district to district and from village to village. Dicsom should carry out a proper load assessmnet in the villages after 1 to 2 years of completion of rural electrification by RGGVY in the village.

Figure 13 No of pending application for electricity connection



There are a large no of pending applications in different distribution circles under different Discoms in rajastahn. This reveals that there are a large number of villagers waiting to get electricity connection.

Economic status of households in villages surveyed:-

From an employment point of view, 257 villagers were NREGA workers, followed by agriculture land owners at 247 and agricultural labours at 216. Skilled labour or those in-service were only found in Jodhpur (4) and Ajmer (8). In none of the districts was there anyone involved in activities like shop/business, small scale industry or food processing industry. Animal Husbandry was found to be a source of employment only in Jodhpur (14) and Ajmer (1). In Chittorgarh, one person was receiving Govt. pension and in Bharatpur one individual was involved in labour work.

Employment Profile

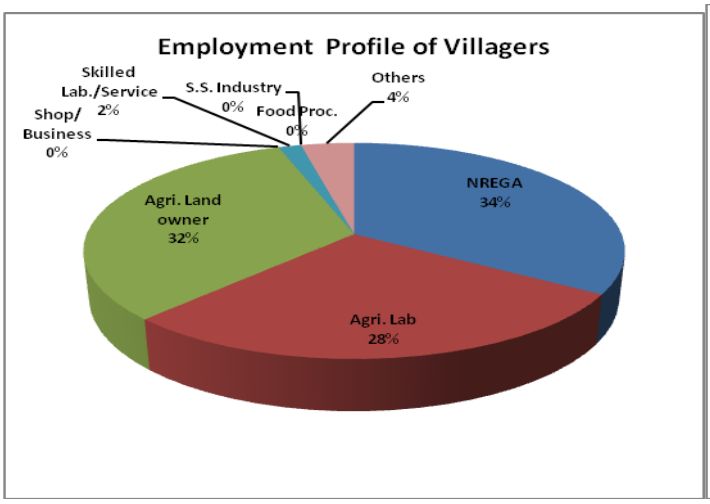
Table 6 Employment Profile

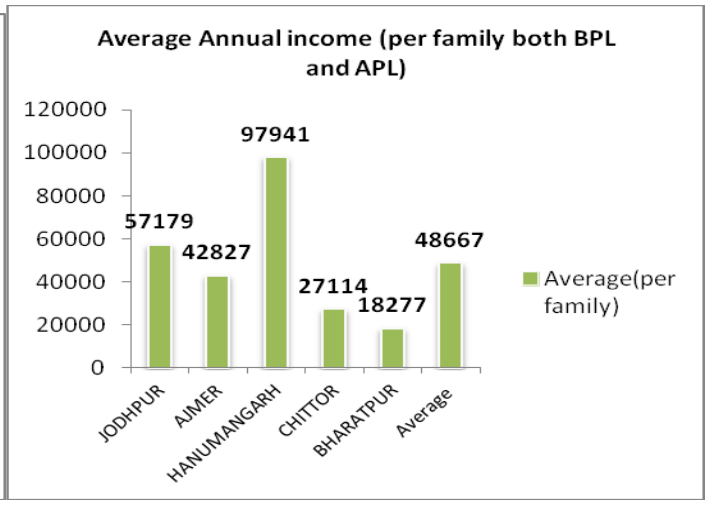
DISTRICT	NREGA	Agri. Lab	Agri. Land owner	Shop/ Business	Skilled Lab./Service	S.S. Industry	Food Proc.	Others
JODHPUR	39	14	39	0	4	0	0	14(AH)
AJMER	35	48	41	0	8	0	0	1(AH)
HANUMANGARH	1	0	17	0	0	0	0	0
CHITTOR	147	124	125	0	0	0	0	1(person)
BHARATPUR	35	30	25	0	0	0	0	12(Labour)
TOTAL	**257**	**216**	**247**	**0**	**12**	**0**	**0**	**28**

AH= Animal Husbandry

In total, approximately 34% of the villagers are NREGA workers. Subsequent large sources of employment are either as Agricultural labourers (28%) or Agricultural Land Owners (32%).

Figure 14Employment Profile of Villagers and Annual income of villagers



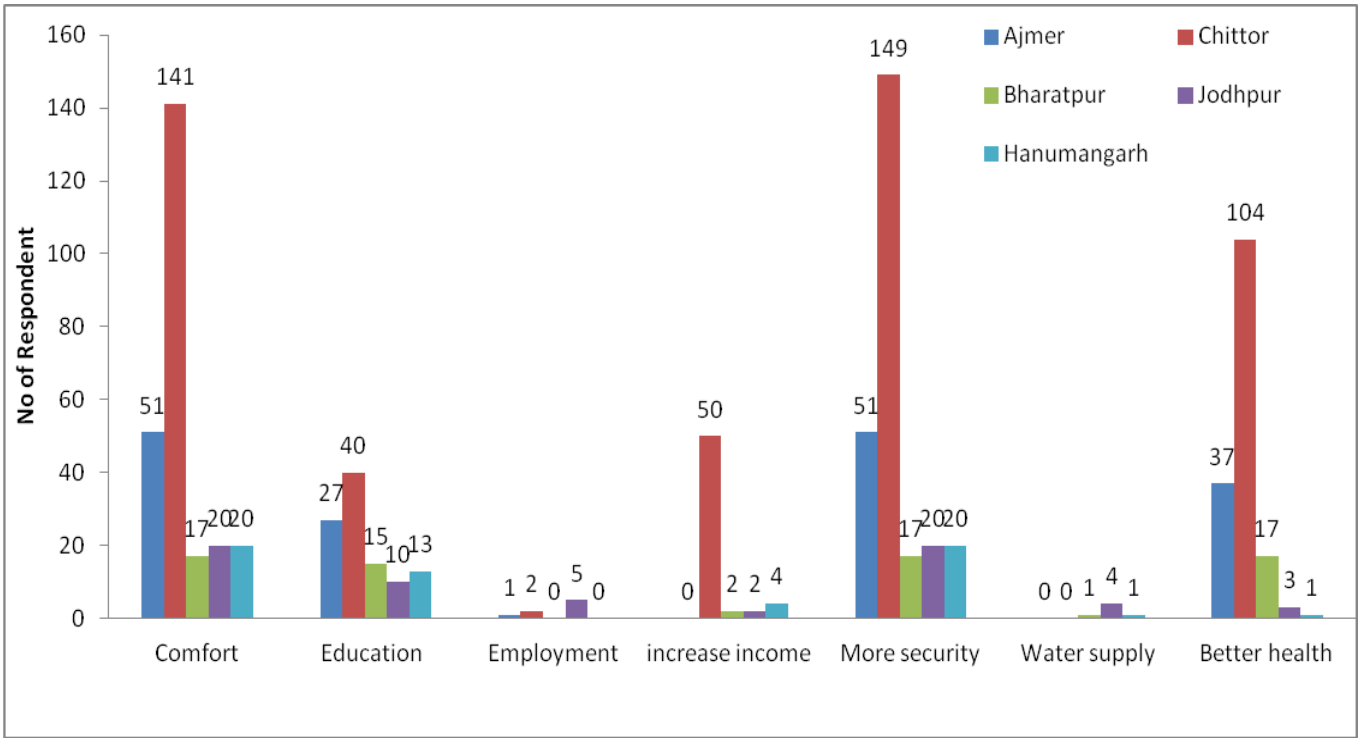


On an average, the income of BPL and APL families came out to be Rs. 48,667 Rs per year. Hanumangarh was shown to have the highest income of close to 98,000 thousand per year. Bharatpur and Chittaurgarh were districts reporting very low levels of income- 18 and 27 thousand respectively. These two districts are the most backward districts of Rajasthan.

Impact of RGGVY:

The Rural electrification policy also aims to facilitate overall rural development, employment generation and poverty alleviation in the village. Given this background, it is very crucial to understand to what extent the current level of RGGVY implementation has been successful in this endeavour. The response from the villagers about the perceived benefits of RGGVY varies from district to district.

Figure 15Socio-Economic impact of RGGVY



In Chittorgarh district, since all the villages were de-electrified, and there was no electricity before RGGVY, the villagers really experienced the benefit of electricity. They enjoyed additional benefits like comfort, education, increases in income, more security and others. So, all the villagers reacted very positively about the impact of RGGVY in the Chittaurgarh district. As can be seen from the graph, a significant number of villagers responded encouragingly about all the benefit they receive from electricity. Also since villages are very remote in Chittorgarh and mostly lie in forest areas, villagers felt more secure during evening hours although

they were supplied only 30-40 minutes of electricity. During the night hours as well, they felt safer while travelling, because of the availability of electricity.

In Ajmer, Jodhpur, Hanumangarh, where supply is better compared to Chittaurgarh and Bharatpur, the responses were mixed. Mostly though, the villagers feel more secure and comfortable after they started receiving electricity. However there were few incidents of reported increases in income as the current level of RGGVY is simply not enough to generate more income opportunities in these villages. Only in Chittorgarh did the households affirm a positive impact of electrification on their incomes, since they were able to establish several small scale activities in their homes, like weaving, tailoring, Kirana shop, and others.

In effect, on an average 66% person feels it was more comfortable living in the village after electrification. Around 68% villagers feel more secure because of the availability electricity, largely due to the availability of light during night hours.

Table Error! Bookmark not defined. **Socio-economic impact in percentage terms**

	More Comfort %(total HH surveyed	Better Education %(total HH surveyed	More Employment %(total HH surveyed	increase income %(total HH surveyed	More security %(total HH surveyed	Water supply improved %(total HH surveyed	Better health %(total HH surveyed	Total no HH Surveyed
Ajmer	92	49	1	0	92	0	67	55
Chittor	74	21	1	26	78	0	54	190
Bharatpur	22	19	0	2	22	1	22	77
Jodhpur	68	34	17	6	68	13	10	29
Hanumangarh	90	59	0	18	90	4	4	22
Average (total response as thepercentage of Total HH in the state surveyed)	66	28	2	15	68	1	43	

Employment opportunities due to the electrification are insignificant as only around 2 % people recounted having received employment in consequence to RGGVY. These 2 % were mainly the people who were working with the contractor in the capacity of smaller contractors executing the RGGVY infrastructure in the village.

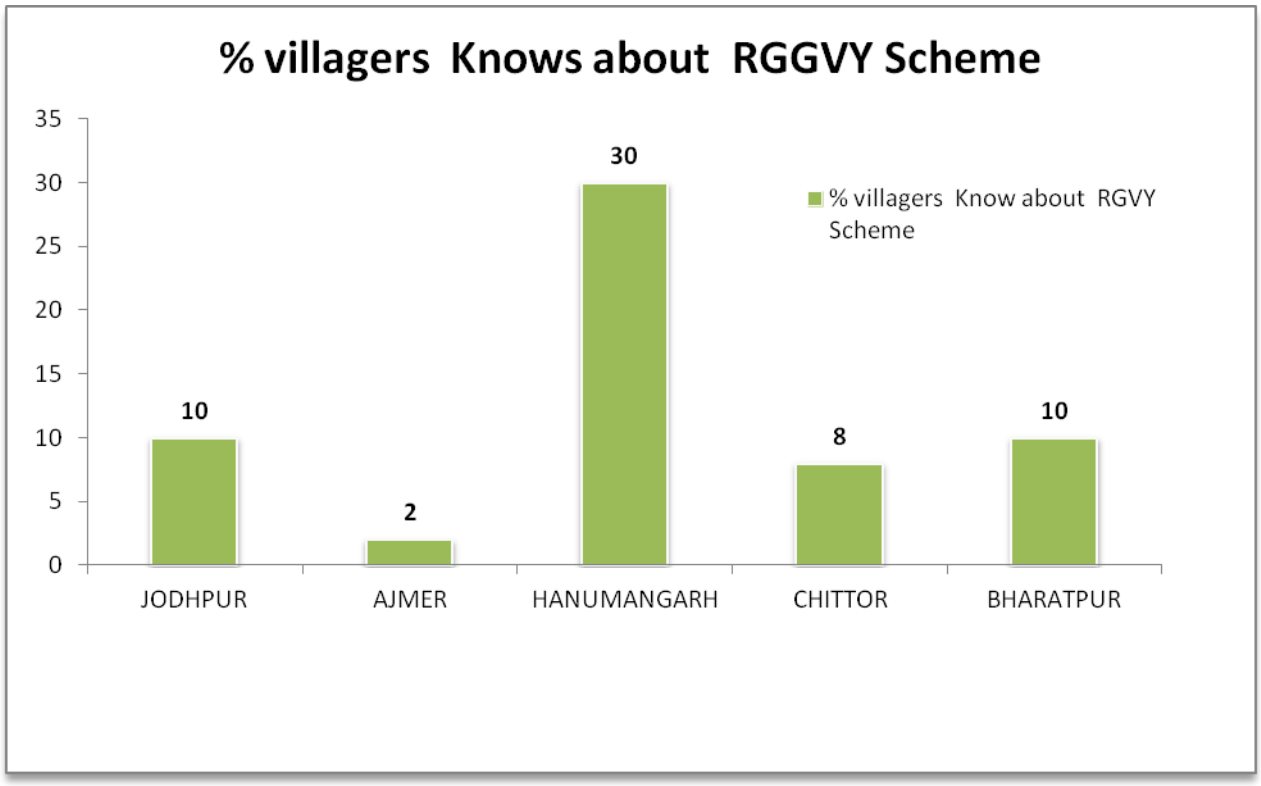
Also, the income of the villagers due to RGGVY had not increased substantially; villagers always felt that NREGA had increased their income as quoted it provided direct benefits in comparison to any other Scheme. However, it was found that approximately 10 % villagers responded affirmatively to increases in income due to electricity as they were using electricity in activities like weaving, tailoring, running Kirana shops and other household-based small business activities. It is very interesting to note that 31% villagers felt that their health had improved due to electricity. They said that in the summer season, due to the use of fan they got relief from the intense heat. The number of people failing sick due to intense heat during summer in Rajasthan has reduced in the surveyed villages.

Figure 16 a Drought Prone Rajasthan village is being surveyed by the IRADe Team

Awareness of RGGVY:

Awareness about RGGVY was dismal across all districts of Rajasthan expect Hanumangarh. Villagers weren't even aware through which scheme they got their electricity connection. They told the IRADe surveyor that either a contractor or the SEBs has told them about receiving their free connection. Although in certain villages, few pamphlets of RGGVY had been distributed to the Panchayats but the information never reached the villagers. Because of this abysmal level of awareness, there are a few cases where a villager has paid money for getting the connection.

Table 7 Awareness of RGGVY



An initial meeting (like public meetings) must be conducted in the villages to seek village electrification. It may be done at the time of the survey as well. The basic nature and objective of the scheme should be clearly explained to the village in a simplified manner.

It should be made clear that only the connection is free and that they have to pay for the electricity. As a result of this, there are villages where villagers did not pay for the electricity. Some RGGVY pamphlets should also be distributed among school children and among the villagers.

Low level of awareness is the biggest obstacle to effectively implementing the RGGVY. The beneficiary must know well in advance about this scheme and provision of electricity in RGGVY should be made mandatory to create awareness in the villages. A high level of awareness can help tremendously in implementing RGGVY in a much more effective manner.

Empowering women:

Women in villages have been the biggest beneficiary of electricity as it helps them in cooking and carrying out other house related activities in much more proficient manner. The following table provides information attained from the survey about women's empowerment due to the availability of electricity. Managing their homes was cited by 97.33%

(Chittaurgarh) to 100% (Hanumangarh) women beneficiaries at all other places, except Bharatpur (33.33%). Amount of time spent working as agricultural labour has increased among majority of the women (75%) as they now spent lesser time during the day for cooking and other activities, hence utilizing more of their time in income generating activities. Although up to 75% women in Jodhpur stated better management of agriculture as a consequence of electrification, none of the women in Bharatpur and only 14.66 % in Chittogarh said the same. The average for the entire five districts was only 29.68 per cent.

Table 8 Empowering women (in percentage)

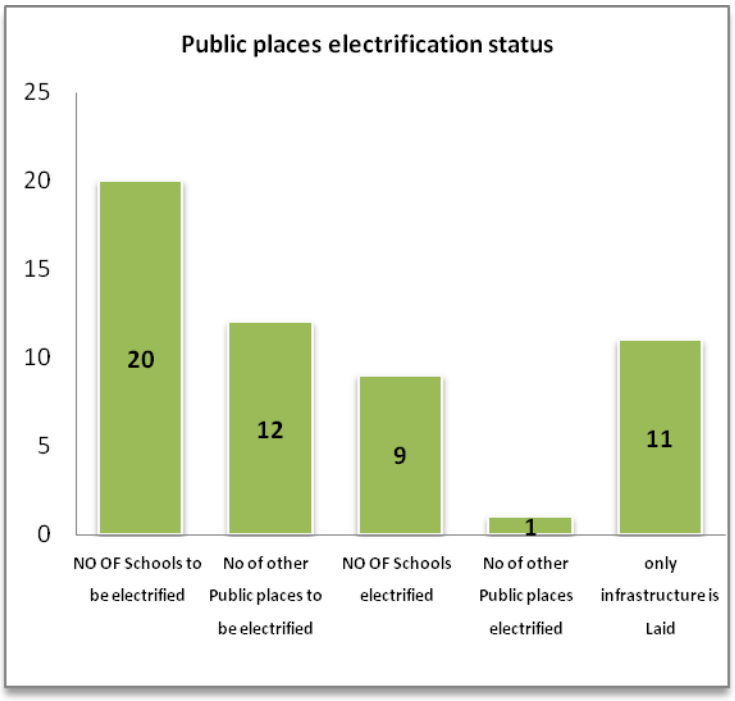
Employment	JODHPUR	AJMER	HANUMANGARH	CHITTAURGARH	BHARATPUR	TOTAL
Managing Home	97.5	98	100	97.33	33.33	**93.47**
Working as an Agriculture Labor	30	51	71	96.66	66.67	**75.03**
Managing agriculture	75	35	71	14.66	0	**29.68**
Managing Flour Mill	0	0	6	0	0	**0.37**
Skilled Labor Tailor/ weaving	0	0	0	0	0	**0.00**
Food Processor	12.5	0	0	0	0	**1.81**
Other/Specify	35	6	0	0.66	0	**6.54**

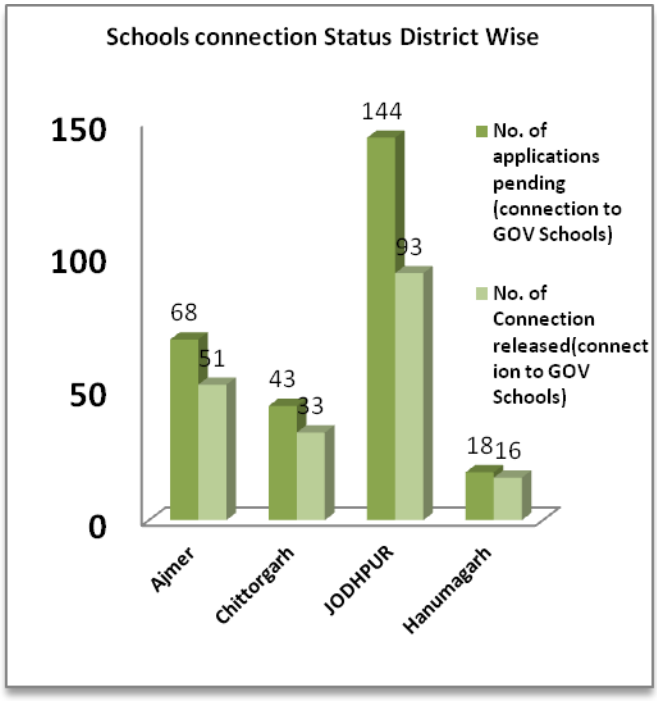
Figure 17 women in Rajasthan are interviewed during the survey by IRADe team.

Public Places Electrification:

Out of 20 schools in the sample villages, only 9 were found electrified. All schools functioned from 10.30 am to 4.30 pm. There were also 12other public places like temples and other common meeting places that were also supposed to be electrified. Only 1 of these places was receiving electricity. However, some Temples do have a connection but it is not metered. In the household survey, among the total number of school going students 232 were boys and 169 were girls. Students felt a benefit of having electricity in schools, particularly during the summer days, as fans provided them additional relief in the summer while studying.

Figure 18 Public places Electrification and School connection pending





Out of 20 schools 8 schools are electrified since 2005.
School timings are 10:30 AM to 4:30 PM in all 20 schools.
School going students 232 boys and 169 girls.

Source- MIS of AJMER DISCOM AND JODHPUR DISCOM

Out of total 32 (20-schools and 12 others) public places, a total of 10 places were electrified. The rest

22 still need an electricity connection. Out of these 22, in 11 cases the infrastructure had been laid but the final connection had not been released. 3 schools had already filed applications and were waiting for the connection to be released. Rest has not filed applications due to funding issues and also because of lack of awareness. In some schools all the electric appliances like fans, pumps are already installed but the connection has not been released. More efforts have to be taken in this direction to electrify the schools as soon as possible.

Although the electrification of schools is impressive in Rajasthan, a large number of schools still remain, who have filed their applications and are waiting to get their electricity connection. In Jodhpur, 144 applications had been received out of which 93 connections were released.

From a facilities point of view, in the five districts, all 5 primary schools of Chittorgarh did not have any facility as there was no electricity. Hanumangarh had the maximum facilities, with respect to lighting, fans, computer, water supply and rest rooms. In fact computers were available only in certain Hanumangarh schools (Table10).

Table 9 Facilities in school

Facility	JODHPUR	AJMER	HANUMANGARH	CHITTOR	Bharatpur	TOTAL
Lighting	2	2	17	0	2	23
Fan	2	2	14	0	0	18
Computers	0	0	3	0	0	3
Water supply	2	0	17	0	1	20
restrooms	2	0	4	0	0	6
Others	0	0	0	0	0	0

Looking at the number of equipments in the schools, their future demand for electricity will be substantial. Adequate funding arrangement should be provided to the schools to pay for their electricity bills otherwise they might face the risk of de-electrification. Under the RGGVY scheme, Community Health Centers should get priority in electrical connections. It has however been seen that at Ajmer and Chittorgarh no connection has been provided, and as a result these centres do not have any appliances like, lighting bulb, fan, refrigerator, AC, TV and other gadgets to benefit people. Jodhpur and Hanumangarh Community Health centres were determined to be best equipped.

Figure 19 Left Photo- one of the electrified school in Rajasthan, Meter installed in the School, Right Photo- School children are being asked about the benefit of the electricity.

Community Health (17sub centers, PHC 1, PVT HOS. 1, in villages, electricity facilities in 10 centres.)

Table 10 Community Health

Electric appliances					
Appliances	**JODHPUR**	**AJMER**	**HANUMANGARH**	**CHITTOR**	**TOTAL**
Lighting	13	0	14	0	27
Fan	8	0	14	0	22
Refrigerator	2	0	1	0	3
AC	0	0	0	0	0
TV	1	0	0	0	1
Other	7	0	0	0	7

Industrial activities/ Commercial activities initiated due to RGGVY in villages:-

In all the surveyed villages, no industrial activities were found. However, household level, small activities like weaving, handcraft and other such industries were found. In one household a tailor running his shop in his house said that after getting electricity he motorized his weaving machine which made his job much easier. There was no presence of diaries in villagers as most of the villagers were directly selling their milks. It was highlighted by the villagers that they wished to set-up small business units, but said that looking at the current level of electrification (which was very less) and the highly unreliable supply, it was not viable to invest money in such ventures, although all other raw materials for the business might be readily available in the villages.

It was observed that the current level of rural electrification has to be intensified- to be pursued more aggressively and in a holistic manner- that small business entities may come up in the villages.

Industrial activities and the commercial activities must be encouraged in the villages which are essential for the long term sustenance of village electrification.

Standard of living in villages:-

Electricity provides an opportunity to people to use various appliances for their comfort and efficient working. The most widely used appliances were found to be the electric bulb (592 or 2.14 per household). Use of a fan (0.65) was the next most prevalent among electrical appliances. Television (0.28) was also found to be quite important and on an average 82 out of 100 households in Hanumangarh district had televisions. Use of mobile phones was found to be widespread in the villages (202) as with electricity recharging of mobile batteries was not an issue any more. Very limited households (mostly APL) used appliances like AC (1), electric press (3), refrigerator (6), heater (2), food processor (nil), electric pump set (nil), grain processor (3) and computer (2)

Table 11 Electricity appliances used by consumers

Appliance	JODHPUR	AJMER	HANUMANGARH	CHITTOR	BHARATPUR	Total	
						No.	Avg.
Light Bulb	**2.45**	2.11	4	1.9	1.83	**592**	**2.14**

Fan	**0.5**	0.76	2	0.5	0.66	**180**	**0.65**
Radio	**0**	0	0.11	0.02	0.38	**12**	**0.04**
Television	**0.5**	0.3	0.82	0.16	0.27	**78**	**0.28**
AC	**0**	0	0.05	0	0	**1**	**0.00**
Electric Press	**0**	0	0.05	0.013	0	**3**	**0.01**
Refrigerator	**0**	0	0.35	0	0	**6**	**0.02**
Heater	**0.025**	0	0	0	0.05 5	**2**	**0.01**
Food processor	**0**	0	0	0	0	**0**	**0.00**
Electric pump set	**0**	0	0	0	0	**0**	**0.00**
Grain Processor	**0.025**	0	0.11	0	0	**3**	**0.01**
Computer	**0**	0	0.11	0	0	**2**	**0.01**
Mobile Phone	**1.15**	1	1.23	0.45	0.94	**202**	**0.73**

Growth in electricity demand in villages from year of recognition as electrified villages:-

Electricity demand in the villages is increasing and it has increased more than expected, particularly after RGGVY. It was disclosed by the Discom utilities, that the average demand growth in the villagers is around 8-9% per year. There is also a lot of unmet demand due to lack of reliable electricity in the villages.

Load demand at village levels and use of HVDS distribution: -

In the entire village sample HVDS mode of distribution has been carried out as loss vie theft can be reduced through this type of distribution system. Conventionally a nearby 11KV line can be tapped and extended to a convenient point in the village. A 25 KVA or 63KVA transformer would be installed at that point and the connection would be extended through a three phase LT line. This method, over a period of time has illustrated several disadvantages which result in huge losses and voltage drops. The use of bare conductors provides temptation for power theft which is very difficult to

check in rural areas of Rajasthan. Though HVDS, 11KV lines are directly extended to as many points as possible, thereby reducing LT lines and consequently losses and voltage drops in the network. Small transformers of 10, 16 or 25 KVA ratings are used, depending on the demand of the consumers. Three phase transformers are installed separately for industrial and agricultural consumers, which are again of lesser ratings, to ensure that no more than three consumers in general are fed from one transformer. Any LT lines required are drawn using aerial bunched conductors (ABC) which cannot be tapped and possibility of theft is completely eliminated.

- Discom engineers appreciated this as a better and more thorough system, but also said that more maintenance is required.

- Most of the Discom engineers felt that in case of failure of any equipment, replacement will be very costly for the Discom.

They confirmed that to some extent, the theft has been controlled due to HVDS, but it was observed during the survey that theft in the form of bypassing the meter was rampant. The relocation of transformer is also problematic as villagers try to shift the transformer location. The fig below shows the shifting of transformer by villagers without the proper approval from the Discom.

Figure 20 shifting of transformer by villagers without the proper approval from the Discom.

Irrigation pump sets working in the village and other heavy duty electrical machines:-

Table 12 Irrigation pump sets in the Panchayats

Particular	Jodhpur	Ajmer	Hanumangarh	Chittor	TOTAL
Irrigation Pump set	823	136	260	228	**1447**

Economic activities existing in panchayats of the surveyed villages

Table 13 Economic activities existing in panchayats

Particular	Jodhpur	Ajmer	Hanumangarh	Chittourgarh	TOTAL
Irrigation Pump set	823	136	260	228	**1447**
Machine Tools	3	1	3	3	**10**
Cold storages	2	0	0	0	**2**
Public Toilets	0	0	0	0	**0**
Sewing/weaving	14	0	0	0	**14**
Street lighting	0	0	0	0	**0**
Small Scale Enterprises	75	52	22	52	**201**
Food processing plants	0	0	0	0	**0**
Flour Mills	11	18	9	25	**63**
Milk Dairies	4	7	7	0	**18**
Others	150	107	0	0	**257**

The previous table reveals from the data collected within the sampled gram panchayats, that there are a number of existing economic activities that are dependent on lighting. The main ones are irrigation pump sets

and small scale industries. They are followed by others which include small domestic machines and water pumps.

Impact of RGGVY on women on quality of life in villages, & safe living:

Decline in crime rate/theft instances was reported by all beneficiaries (Table 15) except in Bharatpur (83.33%). People particularly felt safer at night as reported by the entire sample population in Jodhpur, Hanumangarh and Chittorgarh, 92% in Ajmer and strangely only 11.11% at Bharatpur (Table 15). Due to RGGVY there was an additional livelihood generation.

Table 14 Impact of RGGVY on women on quality of life in villages, & safe living

Safety	JODHPUR	AJMER	HANUMANGARH	CHITTOR	BHARATPUR	TOTAL
Decline in crime rate/Theft instances	100	100	100	100	83.33	98.91
Children do better in study	85	50	100	96	NA	85.47
Feel safer at night	100	92	100	100	11.11	92.72

Impact of RGGVY on community health, women employment and rural industry:-

Table 15 Rural Industries (Sampled Gram panchayat)

Particular	Jodhpur	Ajmer	Hanumangarh	Chittor	TOTAL
Machine Tools	3	1	3	3	10
Cold storages	2	0	0	0	2
Public Toilets	0	0	0	0	0
Sewing/weaving	14	0	0	0	14
Street lighting	0	0	0	0	0
Small Scale Enterprises	75	52	22	52	201
Food processing plants	0	0	0	0	0
Flour Mills	11	18	9	25	63
Milk Dairies	4	7	7	0	18
Others	150	107	0	0	257

Evaluation of RGGVY implementation Process and comments and suggestions on the effectiveness of the strategy adopted:

There are multiple stakeholders involved in the RGGVY implementation and so, a very structured and detailed planning and implementation strategy is required for its smooth implementation. During the interaction with stakeholders it was observed that coordination problems were very high amidst them. The Table below elucidates how to manage the concern of the stakeholders in an integrated manner, for successful implementation of RGGVY. Considering the massive nature of RGGVY, there is a lot of issues at every level/every stage of the project, which slow down the progress of electrification. These issues are generally related to financial, institutional, procedural, management (Project management) and co-ordination snags. During the study, all the issues were discussed in detail with the concerned authorities followed by a discussion on what strategies were followed to overcome these issues. These strategies were then analyzed in detail to comment on the effectiveness of these strategies and suggest further possible improvements.

The table below shows the different strategies adopted and how helpful these strategies are in overcoming the difficulties.

Table 16: Evaluation of RGGVY implementation Process and comments on the effectiveness of the strategy adopted

SL NO.	Stakeholder	Stakeholder interest (s) in the project	Assessment of Impact	Potential Strategies adopted for obtaining support or reducing obstacles	Comments(c) on the effectiveness of the Strategy and suggestions (s)for improvements
	Government of India	1-Timely Completion of the Project 2- Utilizations of funds	**	1 - Monthly Progress Reports giving Physical and financial progress shall be submitted to GOI in the prescribed formats 2 - Quarterly Review meetings will be Held at the MOP	**C-** Although meetings were conducted in a timely manner, the projects are not getting executed on time. **S-** Performance based fund disbursement mechanism should be devised and followed for ensuing the timely completion of projects

2	Government of Rajasthan	1-Timely Completion of the Project 2- Accessibility of electricity to the villagers particularly the BPL households 3-Preparation of REP and notifying on time so that money will be released	**	1 - Monthly Progress Reports giving Physical and financial progress shall be submitted to GoR in the prescribed formats 2 - Bi-monthly Review meetings will be Held at the GoR	**C-** Progress of electrification is slow but electricity supplies to villages are good. **S-** Speed up the process of electrification, incentivize Discoms for this and Create Rural electrification fund for proper maintenance of rural infrastructure
3	REC Ltd.	1-Timely Completion of the Project in a qualitative manner 2-Utilisation of funds	**	1- All specification and quality procedure notified by the REC shall be followed, three tier monitoring should be followed in a strict manner 2-REC will be involved in all review meetings. Copies of all progress reports shall be sent to REC	**C-** Quality of infrastructure created is of good quality in general **S-** REC should strengthen and improve more upon its quality monitoring for the 12th plan implementation and efforts should be made to transfer this knowledge to the State implementing agencies and Discoms.
4	**JDVVNL** **AVVNL** **JVVNL**	1-Good formulation of DPR, Timely Completion of the Project 2-High Quality of RGGVY work 3- Access to good quality of electricity to RGGVY consumers 4-Sustainance of rural electrification in future, proper billing and collection	*	1-JDVVNL, AVVNL, JVVNL will properly prepare the DPR; will be involved with REC, PGCIL and others in all phases of planning, post award activities, and reviews. Timely taking-over the asset from the contractor once it is commissioned. 2-Meeting will be held frequently to remove all hurdles. 3-Must participate in	**C-** DPR preparation process was not up to the mark, and Discoms. Good quality of electricity is not available in villages, villagers faces the risk of de-electrification. **S-** Prepare DPR with proper survey; find the expert agency for preparing the DPR. Create own culture of

				the district monitoring committee meeting. 4- Ensure proper collection and billing of consumers and effective maintenance of the system	Professional project management in Discoms. Create dedicated Rural electrification departments; if franchises are not coming up explore other alternatives. Conduct own evaluation of RGGVY projects
5	PGCIL	1-Preparation of good DPR, timely completion of the Project in a qualitative manner	*	1- Proper survey based DPR formulation in proper consultation with Discoms 2- Continuous interaction/meetings with Discoms officials for removing project related obstacles.	**C-** Good quality of work has been done by PGCIL **S-** Help state agencies in improving their project management skills. Provide the consulting services to state agencies. Increase the knowledge transfer to the Discoms.
6	BPL households and weaker section of the villages and the APL household as well	1-Availability of electricity with safety and security 2-Accurate billing of the electricity consumed	*	1-Location of transformer shall be decided in consultation with village authorities. 2-All safety norms prescribed by the REC should be followed. 3- Proper billing should be done in accurate manner	**C-** Electricity available during the evening hours is poor, BPL households are not aware about RGGVY, Safety about electricity should be explained to the villagers **S-** Wrong billing should not be done, a proper grievance redressal mechanism must be established, and new method of billing (like mobile van billing system) should be explored.

7	General Public	1-Timely completion of projects meeting all the declared objectives	*	1-All policies and procedures shall be open, with relevant information disclosed on the public website, updated in a timely manner.	**C-** Villagers are not very aware about RGGVY, complaints redressed takes a long time. **S-** Proper grievance mechanism must be adopted with telephone helpline numbers for speedy complaint redressal mechanisms. Special Telephone helpline numbers must be created in each distribution circle of the Discom.
8	Contractors	1-Good quality of work within the time. 2-Timely handing over of the asset to owner 3-Timely payments	*	1-Problems with contractors shall be sorted out in monthly review meetings. Record of all the meetings shall be sent to the concerned authorities 2-POWER GRID quality procedures shall be made applicable	**C-** Completed work found to be good during the visit to the villages. Handing over the asset is a big problem **S-** Need to optimize the project management in the Discom, Create dedicated department for Rural electrification, Handing over guideline should be properly followed.
9	Equipment manufactures	1-Timely inspections, clearance and payments		All inspection shall be conducted in an open manner. All inspection calls shall be handled through the internet in accordance with POWERGRID procedures	**C-** Equipment performances so far good , it is very early to comment on equipment performances **S-** Should design very specific electric equipments of rural India

					by taking into account the different nature of demand, load factor and other.
10	Media, Civil society	Timely completion of projects, meeting all the declared and stated objectives	**	All policies shall be open, with relevant information disclosed on the website.	**C-** Media is not very clear about the outcome of the scheme and its effectiveness of implementation. S- More interaction with media is required.

Impact code	Explanation
*	The stakeholder's support is considered **important**. Displeasure of the stakeholder could even halt the project
**	The stakeholder's support is considered **very important**. Displeasure of the stakeholder could even halt the project

It was observed that the long term success of rural electrification and the success of the implementation of this program depended very heavily on the initiatives that the States take, the facilities that they can offer the availability of contractors locally and some construction materials. Under this context more responsibility should be given to the states to implement RGGVY in an effective manner. With respect to providing BPL connections, there is a requirement for BPL lists, which are not readily available always. BPL lists should be made available timely, by the district authority.

There should be proper documentation of the whole RGGVY implementation in a very effective manner so that everything is monitored properly, which sometimes are not being done in case of DISCOMs. Milestones wise monitoring is hardly followed in the by REC as it can only be done with proper documentation.

Handing over asset guidelines need to be more comprehensive. State DISCOM should not delay the taking over of asset. If the state wants electrify BPL on their own with improved armored cable which not as per REC specification, then on this ground taking over should not be delayed. The state can take over the asset and then

release the connections. By and large REC standards and Specification should be followed uniformly. During the discussion this point was highlighted.

There is a Professional gap between the PGCIL and Discom which need to be bridged. This can be done with proper training. Also since in Discom many senior people have been getting retired, and then it is very difficult to find a replace, young engineers from Discom also should be given more chance to work on the rural electrification project. Manpower issues in Disom should be resolved in a priority manner as maintaining the RGGVY infrastructure needs a lot of man power and Discom is already starved of Manpower.

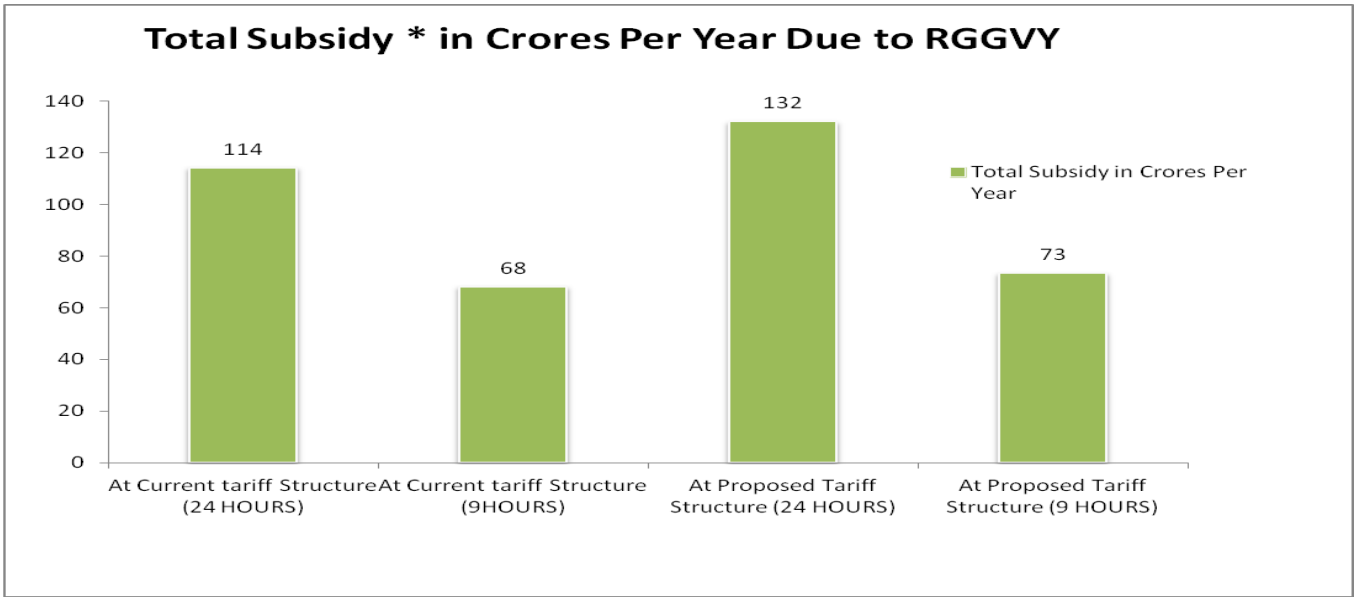
Sustainability of rural infrastructure is a big problem. In this context, universal access to electricity should be achieved through a comprehensive rural electrification plan. If Franchisee is not coming up, alternative institutional models should be explored. A rural electrification fund should be created and funds should be utilized on sustaining (mainly O&M) the RGGVY infrastructure. Manpower planning should be done for maintaining the RGGVY infrastructure. There should be a special drive by the Discoms towards releasing the connection to small scale industries. Maintaining the RGGVY infrastructure is the Major Challenge. It was pointed out that even the Under Kutri Jyoti program the connection that was released; hardly those infrastructures are now in working condition today. Most of the meters are not working. Unless until a clear road map a strategy for how to maintain the RGGVY infrastructure is charted out, the whole Program will not be very effective. One could also think of getting some support from the Centre (through REC) for the operation and Maintenance of the RGGVY infrastructure. The performance based mechanism can be designed for this. There is only one line man per 30 villages (on an average). And we are not provided with the overhead costs incurred while implementation of the scheme. A manpower deficit is a huge bottleneck in maintaining the RGGVY infrastructure.

Find Rural electrification Plan and Policy : -

The main objective of the Rural Electrification Plan was to draw a road map for rural electrification in Rajasthan and to demonstrate how the electrification would be carried out, considering the availability of financial and managerial resources, the power availability, the power system's capacity to deliver electricity to the villages (transmission, sub-transmission network), the funding and budgetary provision for subsidy, the management of rural distribution to enable adequate supply of power to villages and the proper customer relationship management. The rural electrification plan had been prepared by the government of Rajasthan, but it

was not prepared within the six-months regulated as per the rural electrification policy. The rural electrification plan had been written on the template developed by the MOP. However it did not speak clearly about the operation & management (O & M) strategy/plan for the RGGVY infrastructure, the need for manpower and others. It did explain the subsidy burden on the state by assuming a 24 hour supply, which came out to be 115.08 cores per year. It was to be supported by GoR through budgetary support in addition to the cross subsidization. If one tried to calculate the actual subsidy that will be required for all the BPL consumers, taking both 9 hours and 24 hours of supply for a contract demand of 40 Watt, the subsidy burden due to RGGVY will amount to 115 crore per year for 24 hours supply and for 9 hours of supply it comes to 86 crore per year to the current Tariff regulation of the RERC.

Figure 21 Subsidy estimation for RGGVY consumers Provisioned in Rajasthan



Source: IRADe Analysis

Note* **Note:-Total No of BPL Connection is 13, 70000**

Contact load Is -50WATT

Subsidy given by GOR- 1.10/Unit as energy charge

30 rupees /month at fixed Charge

Up to 50 units per month (BPL)-Rs 1.95/ unit EC, Subsidy by GoR*-Rs 1.10/ unit, Effective EC after subsidy- Rs 0.85/ unit

Proposed - Subsidy by GoR*-Rs 1.40/

If we take the proposed Tariff regulation announced by the RERC, these figures change to 132 crore per year for 24 hours of supply and 73 crore per year for 9 hours of supply. It is shown in detail in the Figure 13.

Last year, GoR spent 500 crore as subsides, but there is no specific budgetary support for the RGGVY Tariff. There is a specific provision for RGGVY consumers for revenue support. There is a need to make more concrete efforts in these directions.

Since the Rural electrification Plan (REP) is an important document which envisages the border vision of rural electrification Rajasthan, thus it is very essential to integrate the State Rural Electrification schemes and other complementary programs with the REP and REP should be part of the Border planning process of the State. REP should also explain institutional arrangement required for implementing REP. REP plan should be reviewed vis-vis progress, through a committee chaired by energy Secretary and Amendments may be made if required from time to time.

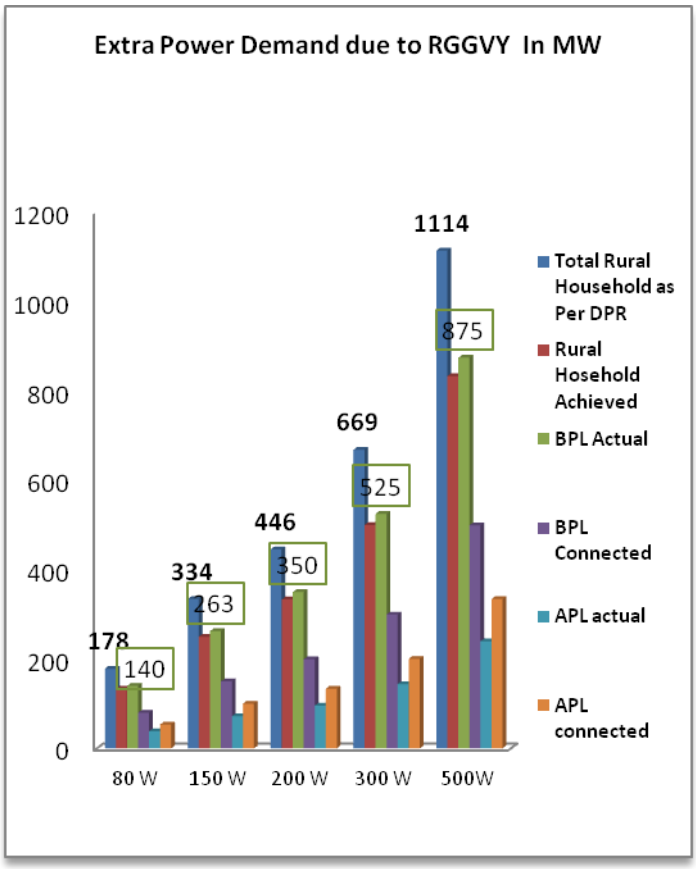
Extra Power Demand due to RGGVY and Availability of power :

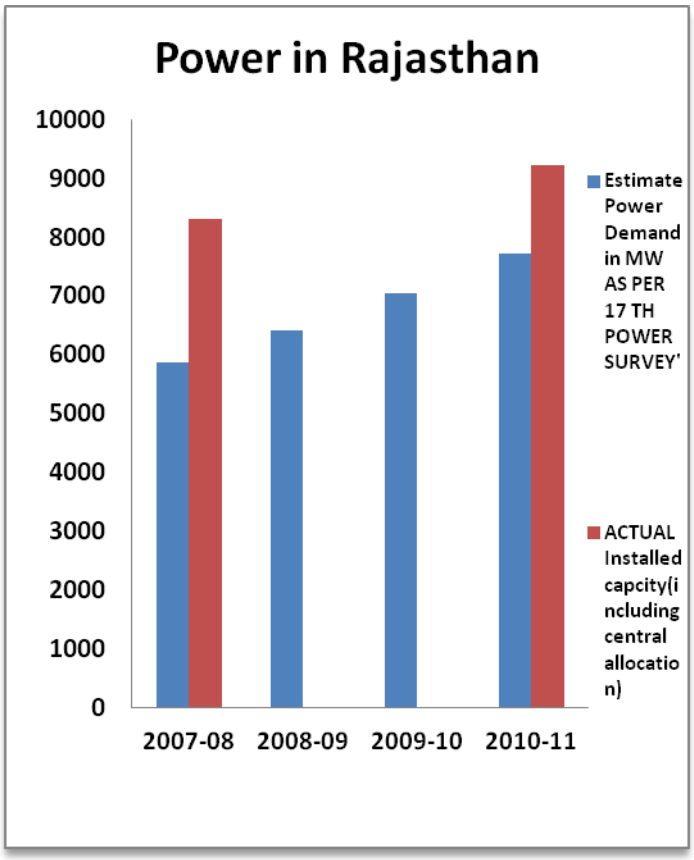
Looking at the huge suppressed demand that is present in rural India, and with the progress of RGGVY in rural Rajasthan, there will a lot of demand creation due to RGGVY. As we know that demand in rural households (BPL) in Rajasthan varies from 80 watt to 500 watts per household, more demand is created for Rajasthan.

If we take the total number of rural households (around 22,29,442) that are to be connected through RGGVY and assume a demand of 150 watts per household, then all these rural households will altogether create a demand of 334 MW. This has to be arranged by the Rajasthan government for ensuring adequate supply to the villagers. This 334MW is the demand at the village level. If we assume the average transmission and distribution losses at around 27%, the effective power demand will be around 424 MW (334+90), which is a considerably high figure.

Considering the level of progress till March 2011, the existing electrified BPL households (around 999079) created a demand of 263 MW on the Rajasthan power system. Incorporating the average transmission and distribution losses (27%), the effective demand is 334 MW (263+71).

Figure 22 Extra Power Demand due to RGGVY and Availability of power





So how is this year's demand going to be met in Rajasthan? As per the survey, power demand in Rajasthan would be around 9000 MW and the actual installed capacity toady is 9500 MW. Going by this simple analysis, the state should be able to meet the demand. The capacity addition planned for the 11th Five year plan (2010-2012) is through Conventional sources (4465 MW) and through Renewable sources (1200 MW). The planned capacity addition during the 12th Five year plan (2012-2017) is around 13510 MW. Out of these, the Projects in progress are around 5730 MW; in principle, the Projects approved among these is around 4780 MW. Renewable Energy around 3000 MW will also be added during the 12th plan.

Chapter-5

Formulation of DPRs Time schedule for implementation

Formulation of DPRs Time schedule for implementation

The DPRs were prepared in a hurry to fructify the program and start its implementation. State REC office headed by Chief Project Manager (CPM) conducted field visits in respective Districts/Distribution Circles to verify the data DPR and make necessary improvements. Central PSU designated by MOP or the State Discom who were required to implement District/Distribution Circle wise RGGVY Project owned the DPR and were Project Implementing Agencies (PIA) responsible for creation of VEDB and VEI for the Villages and implementation of DPR. The **DPR** should be made much more accurate and a proper survey should be carried out to ensure that the DPR preparation cost should be part of the RGGVY funding. The preparation of DPR can be outsourced to an expert agency by the Implementing agency/Discom so that better DPRs are made. Once the DPR is made by implementing agency, REC-CPM office will study the DPR in detail and conduct field surveys and finally approve the DPR. Then the DPR is sent to the REC corporate office for necessary approval from the appropriate authority. Adequate time should be given to prepare the DPR as it should not be prepared in a hurry since its approval takes a long time. Also, while implementing, a small survey should be carried out to get the real picture and proper demand estimation.

18 months after the date of awarding of contract is the standard time within which the project must be completed. During the 10th plan, the project time was 22 months which has now reduced to 18 months.

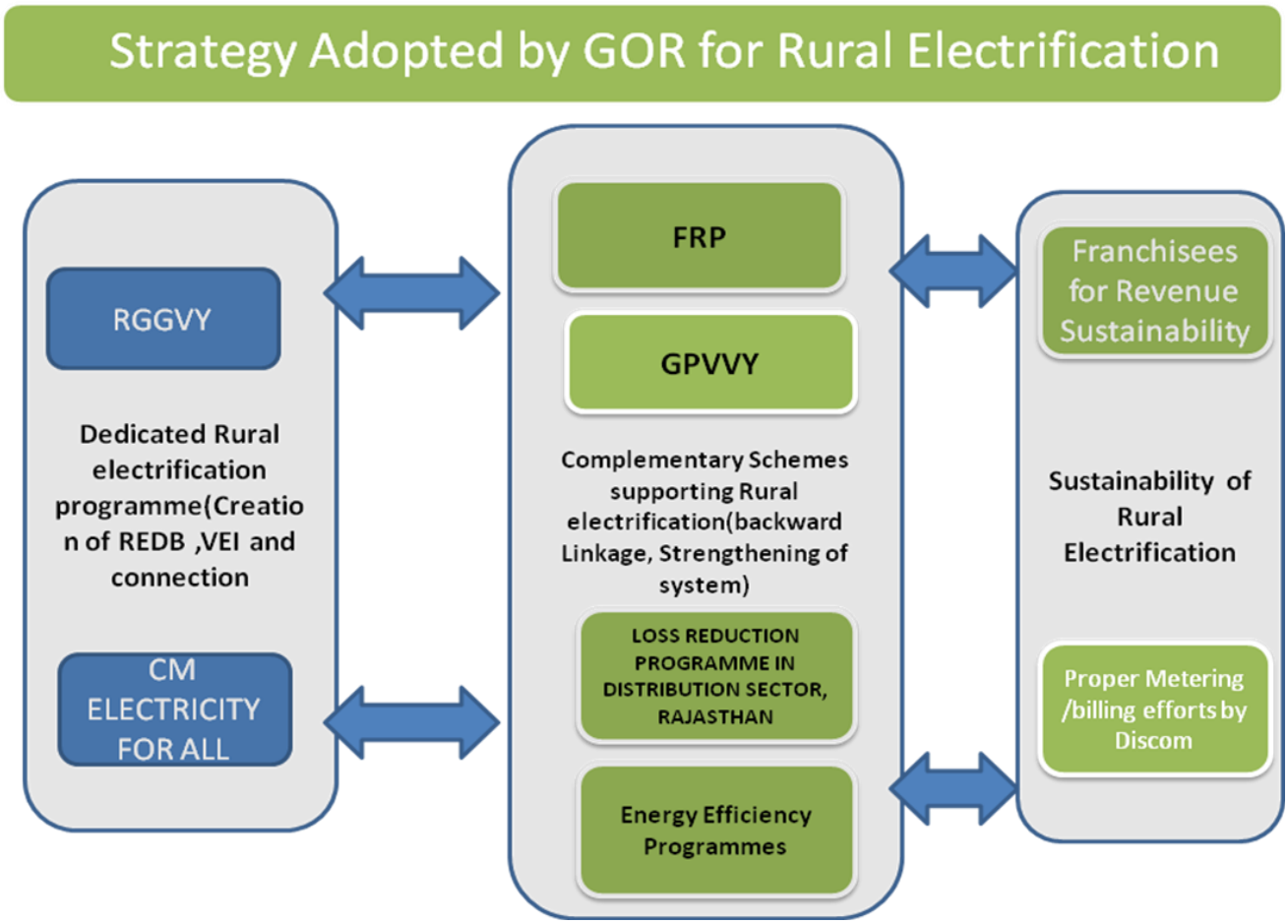
District	Date of Receipt of DPR	5 Year Plan	DPR Sanction date	Date of Awarded Contract	Date of Finishing the Project	Sanctioned Cost	Name of Implementing Agency
CHITTAURGARH	15-01-2005	11th Plan	5/3/2008	6/3/2006	Financial Closure not Finished	5984.39	AVVNL
HANUMANGARH	23-02-2005	11th Plan	18-03-2005	25-11-2005	NA	222.85	JDVVNL
BHARATPUR	30-09-2005	11th Plan	5/3/2008	20-11-2008	NA	4426.97	POWER GRID
AJMER	30-08-2005	10th Plan	30-09-2005	24-04-2006	NA	2206.22	AVVNL
JODHPUR	8/9/2005	10th Plan	30-09-2005	22-02-2006	Financial Closure not Finished	2853.85	JDVVNL

Feedback from DISCOMs

There are many cases of administrative delays from Discom side like rectifying the Defects in the constructions, implementing field inspection recommendations. There should be dedicated manpower and team for rural electrification in the Discom. The department should be empowered with the necessary resources to successfully implement RGGVY, operate and maintain rural electrification. The need for dedicated team is very essential as they will take care of whole RGGVY infrastructure and will help in sustaining the RGGVY infrastructure.

The strategy adopted by State for rural electrification:

The strategy adopted by State for rural electrification is multifold. There is not integrated strategy that is adopted by the State government to have comprehensives and holistic rural electrification in the state. There are many programs running at the same time by the state which some way or the other supports rural electrification in Rajasthan. It is also very evident that GOR relies heavily on RGGVY funding for putting very costly basic infrastructure in villages and strengthen the supporting infrastructures though RGGVY. All though the complementary schemes are not designed specifically to support the rural electrification but they in general do support the RGGVY and helps in the sustenance of rural electrification in Rajasthan. CM electricity for all schemes (**Mukhya Mantri Sabke Liye Vidyut Yojana**) support the rural electrification as it targets to cover the Sub villages having less than hundred populations which not currently covered under RGGVY. These villages must be within 1 km of the nearby 11 kv line, only then this connection can be released. It relies on progress of REDB construction though RGGVY and one that is done, the Yojana helps to release the connection. It aims to electrify minimum of 10 household only after receiving of applications by households on payment of 200 rupees. This scheme is designed in a cost effective manner to exploit the full potential of RGGVY infrastructure where RGGVY is not able to electrify all the Dhanis. The subsidy for giving the connection is 3500 hundred rupees per connection.



Certainly this particular scheme does help in releasing more no of connection which is not covered under RGGVY but how to maintain these connections, how to properly operate and maintain the networks, how to properly bill and collect revenue of the consumers, all these questions need to the properly addressed. For doing that first detailed assessment of all these connections, a strategy road map should be prepared in these directions. This is very crucial as it will ensure and address issues concerning the sustainability of rural electrification. Although to a large extent bills are issued in villages in Rajasthan but quality of billing is needed to be improved. Most of the time average bills are issued (when meters are not working or the meter reading has not been taken) to village consumers, which are not accepted by the villagers and as they say average billing always is more than what they have consumed. This creates a lot of concern in villages and heeds to be properly addressed.

As electrification is mostly being done is grid based, so maintenance and strengthen of the grid, distribution networks are as important as building rural electrification distribution infrastructures.

Chapter-6:

Long term Village Electrification initiative from state/ DISCOMs

Long term Village Electrification initiative from state/ DISCOMs

In 12th plan Rajasthan will have an additional power generation in tune of ~ 14000 MW. This should take care of demand side problem partially. The main problem of Rajasthan is highly distributed hamlets of small population termed as Dhanis. In the original RE Plan strategy was to electrify villages having population more than 300. In Feb 2008 they applied for approval of RE of villages having a population of 100- 300. The approval was received at the end of 2009. Works in those villages are in progress. Now they have moved for RE of villages/ hamlets/ Dhaanis of population less than 100. There are ~30000 Dhaanis. Hope to get the approval soon and we will take up the implementation in 12th plan. In 12th plan `4, 00,000 population/ year will be covered under REC objective in domestic light.

State Rural Electrification Strategy

Rajasthan government had taken up Feeder Renovation program (FRP) to strengthen the distribution network. There are 8850 feeders covered under FRP. In this 8327 feeders have been renovated at an expenditure of Rupees 4485 crores. In the year 2005 the distribution losses were 40.22% and that has reduced to 21.19%. Thereby they have saved 2652 units of power amounting to a financial saving of Rs. 9386 crores. Rajasthan Government has planned for Gram Panchayat Vidyut Vitaran Yojana. Under the scheme for a cluster of 3 villages they have a substation and the village will have one feeder line. The FRP program has resulted in a change in scope of work of PGCIL in some places.

The villages I surveyed had HVDS system, that is, the village had one 25 KVA DT, and two 5 KVA DT. FRPA program was taken to reduce T&D Losses.

Chapter-7

Decentralized Distribution Generation

Decentralized Distribution Generation (DDGs)

Rajasthan has planned to electrify villages both through the extension of the grid and also through the non grid. It has planned to electrify 189 villages though non-grid method.

Name of the Discom	Villages to be electrified by Non-Grid
Jaipur Discom	40
Ajmer Discom	98
Jodhpur Discom	51
Total	189

Rajasthan plans to electrify 189 villages through a Non - Grid form of electricity. The strategy and plan to electrify the villages by non grid will be worked out by the Rajasthan government in collaboration with the SREDA.

The state will put in place administrative mechanisms like single window clearance, for easy access in giving necessary approvals and clearances in a time bound manner, to facilitate development of DDG projects and exploit the full potential of local resources. As per the guidelines, the list of villages/hamlets to be electrified through DDG is to be finalized by the State Renewable Energy Development Agency/Departments promoting renewable energy, in consultation with State utilities and MNRE. The RGGVY Monitoring Committee of the Ministry of Power would sanction the projects on the basis of merit. The DDG projects would be owned by the State Governments who will decide the implementing agency for their respective States. The Implementing agencies will finalize the prioritized list of villages/hamlets to be electrified through DDG and get the DPRs made through a panel of consultants to be identified by the Ministry of Power. Creation of an Implementation Support Group (ISG) by the Ministry of Power to coordinate/supervise the scheme has also been outlined.

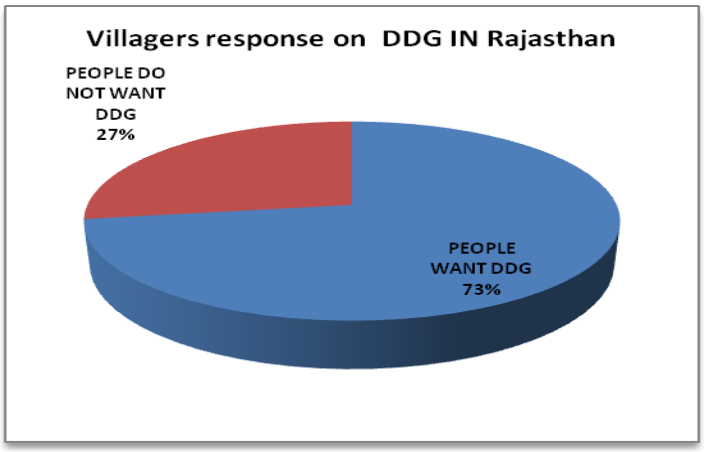
Whether DDGs operationalized in state: isolated or grid connected.

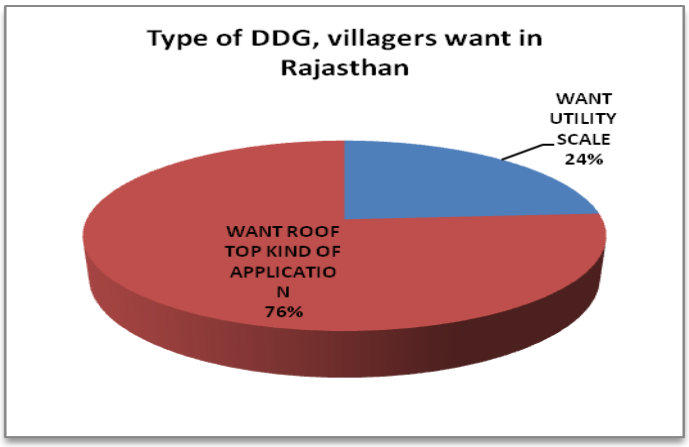
There is no operational DDG in the state; however the IRADe team was informed of 2 DPR that had been prepared for implementing DDG in Rajasthan.

Stake Holders view on Present form of DDG scheme.

An intense stakeholder consultation was conducted with villagers regarding DDG in villages. Initially the DDG scheme was very clearly explained to villagers to seek their views on DDG. Villages in general and villages getting unreliable power supply in particular, expressed their keenness to have DDG in their villages. Particularly the youth in the villages showed a lot of interest in putting DDG plant in villages. 73% of the villagers showed their interest to have a DDG system in their villages while 27% said no, because they feel that DDG is not going to work properly and won't be able to supply enough electricity in villages. They preferred to have grid based electricity instead of DDG. They also said no because it is very costly as compared to the conventional electricity they receive from the grid, however this response were mostly from those villagers who are receiving electricity to some extent. The villagers having no electricity or very less electricity showed their willingness to pay more than what they may pay if they get grid electricity, they said they are paying 4-6 six rupees per hour for simply charging their mobile phones. So paying 4-6 rupees per unit of electricity is not very high for them. They show their willingness to pay for the higher price for getting reliable electricity as they have pointed out that any way they are paying more prices for getting the energy services.

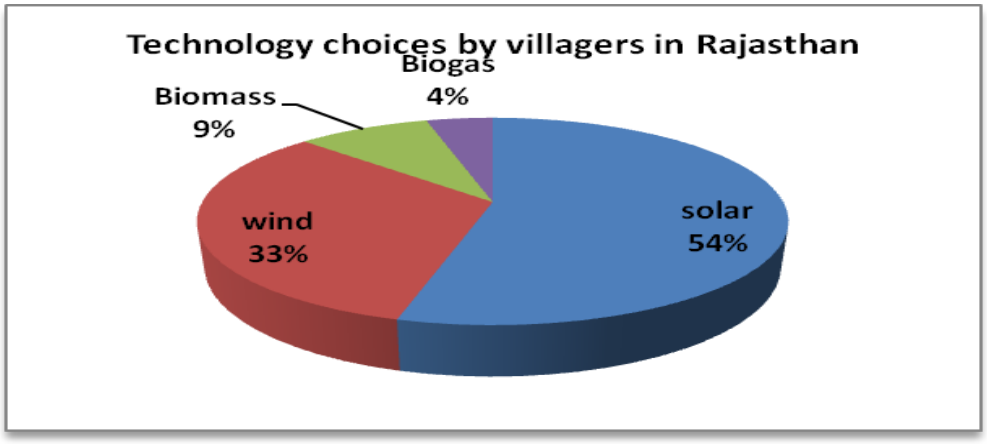
Figure 23 Villagers View on DDG





Although 73% villagers showed interest for DDG, they were not very much in favor of having a Utility scale DDG / a single power plant (Example- Solar PV plant). Instead they preferred the roof top application of solar PV. Even having individual Bio Gas Plants for each households were preferred to having a centralized bio gas plant. 54% villagers said solar technology was the best for having DDG in the villagers because it can be installed very easily on the roof top of every household and also because solar resources are very good in Rajasthan. This view was because of the fact that they simply did not want to have more transactions with the plant owners, which may be the local governments. On being asked about the maintenance of roof top PV systems, they stated they can easily maintain it. Many villagers also showed interest in wind power, but it wasn't liked much since smaller wind generators are not very good for generating electricity and also as wind power generation is highly unpredictable.

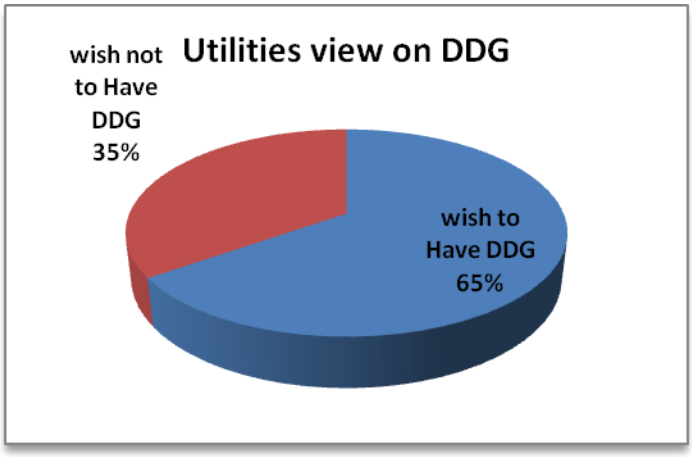
Figure 24 Technology choices by villagers in Rajasthan

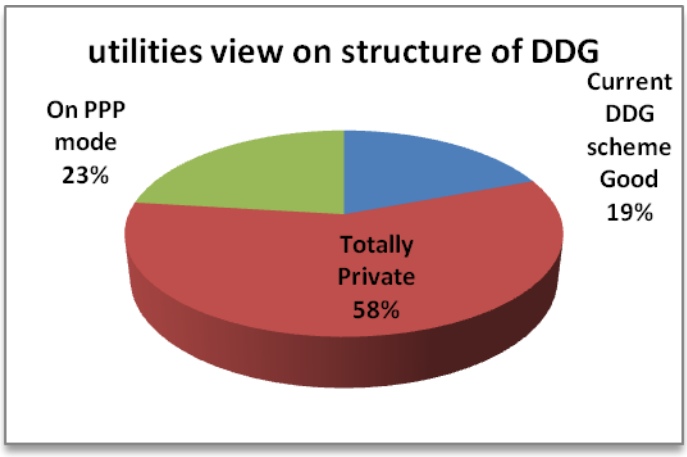


The local utilities showed a mixed reaction for implementing DDG projects in villages. They said that it would be very helpful to the villagers but mostly for building large utility scale power systems because of

economies of scale. Solar technology is the best technologies for implementing the DDG. Mostly the top level officials showed their interest to implement DDG, however at the lower levels, reactions were not very encouraging. Junior level employees believed that DDG might be useful to villagers if it was implemented in a proper manner; however they said Discoms were not the right agency for running and implementing the DDG. During the interaction it was found that the Discom had a very limited capacity for taking up DDG, even after it was successfully run by the developer for five years, because of various issues like manpower and cost. There is an urgent need to think of a proper institutional mechanism for make DDG into a reality.

Figure 25 utilities view on structure of DDG





58 % of the Utility officers and junior level employees said the entire approach towards DDG should be through private ownership and operator plants. If complete private ownership is not possible, then the operation and maintenance activities should be outsourced to private enterprises on a contractual basis for the operation and maintenance of the plant. 23% of the villagers believed that it should be via a PPP, but with a very clearly structured PPP mode. It also came up during the interaction that since it is very difficult to build feasible DPRs village wise, a cluster of the village approach should be followed. Micro-grid based DDG should also be explored to ensure technical and financial feasibility of DDG projects.

Proposed modification in DDG scheme:

1. A detailed DPR compiled on a cluster of villages should be worked out in a timely manner by the respective state nodal agencies for implementing DDG, which is RREC/REDA in Rajasthan. A proper

mix of technology should be worked upon in the DPR, after a proper resource assessment of the locality. In Rajasthan, solar based DDG is very much feasible and solar technology should be encouraged.

2. Institutional arrangement for implementing, operating and maintaining the DDG should be clearly marked out. As from the interaction, it was observed that the Discoms were not interested in operating and maintaining the system, even after five years of successful operation by the developer. A holistic view must be taken in this direction as it will address the Public–Private partnership structure of the DDG which provides long term in built incentives for the project developer throughout the life of DDG rather than just for five years.

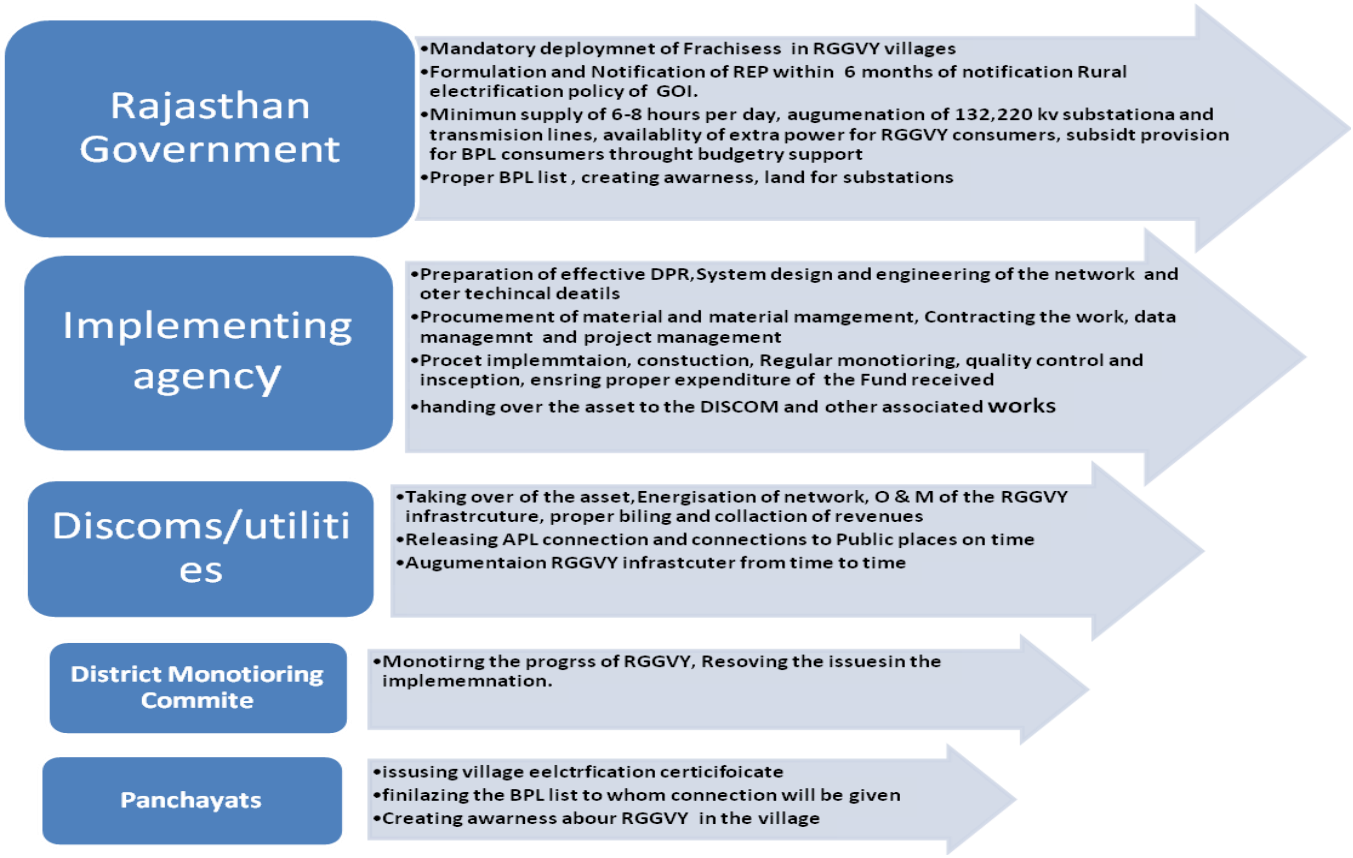
3. If the Discom shows their aggressiveness to implement DDG, then VGF model should be pursued in a proper manner. **Generation Based Franchisees model-(VGF Mode- through competitive bidding should be encouraged)**

4. State government should announce Feed in tariff for DDG projects which will bring Private sector investment in DDG.

5. The current DDG scheme is not very encouraging for the entrepreneurs to be involved in as there are no sufficient incentives for them to participate in the scheme. Instead of simply involving the private party as developer for five years, a long term partnership should be created by the private partner.

ROLES AND RESPONSIBILITY ANALYSIS.

The roles and responsibility of different stakeholders are clearly defined in the implementation process.



The clarity on the roles and responsibility is very clear at the top level like at the MOP, REC but when it goes to the lower level of implementation, due to institutional structures there is overlapping of responsibilities there by creating ambiguity in smooth implementation of the RGGVY. MOP and REC has the over all responsibility of implementing the RGGVY as per its objectives. To a large extent MOP and REC is able to fulfill their responsibility although BPL connections released are still around 60% of the target.

As far as GOR is concerned there are more specific responsibilities has been signed to the GOR. The GOR has formulated his rural electrification plan and has notified it. However it was within the six months of the notification of rural electrification policy. Most of the surveyed villages GOR have been able to give a minimum 6-8 hours of supply of electricity. Deployment of Franchisee in rural areas is very poor which is very important for the revenue sustainability of the rural electrification. It was found that many villages feasibility of the Franchisee is a big issue and Discom are not able to deploy Franchisee in a quick manner. However the billing and distribution bill has been outsourced by the Discom. State government has to take more proactive steps in this regards. Intensive training on franchisee has to be conducted in all the Discoms both at the senior

and junior level. During interaction with various stakeholders it was found that performance based mechanism should be devised to have more better and effective implementation of RGGVY. There is also a need to make the entire program more decentralized and involve the state in a much more participatory manner.

Figure 26 Shri P.S. Jat, **Managing Director of the AJMER Discom during the interaction with the IRADe Team, discussed various aspect of RGGVY in Ajmer Discom.**

Availability of authenticate BPL list was a big problem initially, however through proper intervention by district authority it has been sorted our largely. But finding the true BPL beneficiary at the village level is still very difficult as habitation has changed over the year. Much more concerned effort has to be carried out to have authenticated BPL list so that release of BPL connection is not delayed. It has been observed that due to the unavailability of proper BPL list the progress of BPL electrification has been delayed whereas APL electrification is very good.

The district monitoring committee was very helpful in implanting the RGGVY and sorting out the issues delaying the RGGVY implementation in the district. However there is need to have more capacity building of the District is monitoring committee to have quicker and better decision making. DMC –Needs more capacity **and expertise** in implementing RGGVY. The Circle office should prepare an agenda for DMC meeting And Regular meeting needs to be conducted. DMC should devise **strategies for energy efficiencies** in rural areas as in future marinating appropriate efficiency on RGGVY system will be challenging due to the problem of operation and

maintenance and use of inefficient devices by rural consumers which will adversely impact the system. Human resource Constraints in the Discom is affecting the effective implementing of RGGVY in Rajasthan. There is a need to bring younger employee of the Discom to work in RGVVY. RGGVY infrastructure will require proper maintenance is required for which more dedicated staffs are also required.

GOR Rajasthan also supposed to carry out a lot of awareness programs regarding RGGVY; however from our survey we have observed the level of awareness about RGVY is extremely low. In some cases due to this ignorance, villagers have paid money for getting the electricity connection. In some villages people are of the view that both BPL connection and electricity use is free under this scheme. Due to this wrong understanding the entire village is not paying the electricity bills. Much more effort needs to be done to create awareness about the program. There should public notice in the villages explain the salient features of RGGVY should be put in.

There is no separate/specific subsidy provision from the GOR for BPL electricity consumption. REP of Rajasthan is 115 crores of Indian rupees. There should be specific budgetary provision for subsidizing the BPL consumers.

Sarpanch or village head must certify after inspection of village electrification by a competent body. Awareness should be created among Sarpanch regarding this process. **Within 2 months** Certificate should be issued by the Sarpanch to PIA and in case of delay, the block development officer may issue certificates on behalf of the village as it was observed that some village head deliberately do not wish to issue the certificate,.

Chapter-8 Franchisee

Franchisee models proposed under RGGVY scheme and Status:

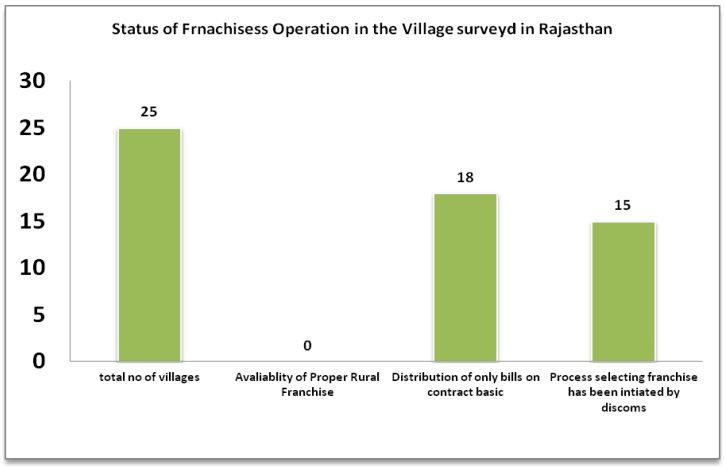
There are many variants of the franchise model in Rajasthan. Initially Rajasthan proposed to go for bill collection based franchise for a start. Subsequently it was converted into an input based franchise. The arrangement entailed purchasing of bulk power and routine operation and maintenance of distribution infrastructure.

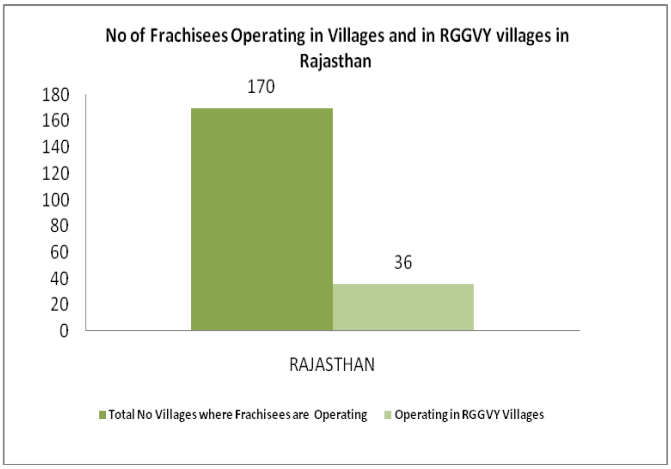
Total villages in the state	Village proposed to be covered under RGGVY	Franchisee proposed to be established in RGGVY villages	Franchisee established in RGGVY villages as of 31.3.08
41353	4420	4420	35

In the study villages, there was no deployment franchise. However the distribution of bills had been outsourced to some private agencies in 18 villages in Rajasthan out of the 25 samples villages. In 15 villages, the respective Discoms had started the process of finalizing the deployment of Franchisee.

Rajasthan does not have a franchise system as specified in the RGGVY guidelines. They out-sourced the billing and Revenue functions. The average cost of Billing is Rs 5-6 per bill and collected through e-Mitra is Rs 2-3/ per collection. The collection in this way is above 90%. The scheme may be taken as a franchisee by default.

Figure Error! Bookmark not defined. **Status of no of Franchisee Operation in the Village surveyed in Rajasthan**





There was not a single fully operating Franchisee in the surveyed villages. For Discoms in many villages, the distribution of bills had been carried out on a contract basis. A spot billing order was issued for 12 districts. Franchises for spot billing were working in Alwar, Dholpur and Karauli. The financial feasibility of franchises in rural areas is extremely difficult and since they are not coming up, an alternative option should be explored. In many cases, even the Discoms were not able to award the franchisee, as the price quoted was very high for the Discom. Rebidding is being done currently for these Franchisee. However, in many villages, even without Franchisee the Billing and collection is remarkably good. In this context alternative or hybrid options for revenue sustainability should be explored.

The Franchises are not coming up due to the Poor Hours of Supply, Poor Consumer Mix, Scattered Villages(low density), lack of accurate bench mark and base line data, commercial dispute due to contractual obligations, financial infeasibility of franchisees in rural areas. Instead having mandatory franchisees Efforts must be made to explore alternatives to franchisees in future.

Improved franchise models being planned in the state.

A hybrid model, with a combination of Discoms and Private enterprises only to perform the activities of spot billing and distribution of bills can outsourced, whereas collection would still remain in the Discoms' hand. As other innovative ways of franchises are not coming up (like cooperatives and others form) it was suggested that other situation specific alternatives should be explored. Options like mobile van based billing and collection

should also be started in rural areas on a pilot scale, to see its applicability, since in Rajasthan, people in rural areas live quite scattered.

There should be effective capacity building programs of Franchisee, consumer associations and Panchayat Raj associations in a more aggressive manner. During interaction with the employees insides the Discoms, certain reluctance towards Franchisee was perceived, which needs to be addressed in a proper manner.

Recommendations for more effective implementation of RGGVY:

- **Performance based fund disbursement mechanism should be devised in consultation with the all the stakeholders and should be followed in ensuring the timely completion of projects. In this regard certain specific guidelines may be prepared.**
- **Electrifying the remaining BPL household and all the Hamlets below 100 populations should also be covered under RGGVY in 12 th plan to meet the target electrifying all BPL HHs.**
- **Speed up the process of electrification; incentive Discoms for speeding up the rural electrification and Create state level rural electrification fund for proper maintenance of rural distribution infrastructure. Create dedicated rural electrification department for looking into the issues associated with rural electrification. In future efforts should be made to electrify households living in Hamlets less than 100 populations.**
- **Since already a huge amount of Rural distribution infrastructure has been created, a specific and appropriate plan should be prepared by the State Government for the maintenance of infrastructure**
- **REC should strengthen and improve more upon its quality monitoring for the 12th plan implementation and efforts should be made to transfer this knowledge to the State implementing agencies and Discoms.**
- **Sustainability of rural; electrification is the bigger concern as many villages do face the risk of de-electrification in the future. A rural electrification fund should be created by a joint contribution**

from the Centre and the State to primarily fund the operation & maintenance and systematic improvement of the rural distribution infrastructure that is created under RGGVY.

- **Prepare DPR with proper survey; find the expert agency for preparing the DPR. More efforts are needed to Create own culture of Professional project management in Discoms. DPR cost should be financed by the REC through RGGVY.**
- **Since the franchises are not coming up efforts should be made explore other alternatives. The state government should conduct their own evaluation of RGGVY implementation in the states; respectively SREC may be the proper institute to conduct these evaluations.**
- **Wrong billing should not be done, a proper grievance redressal mechanism must be established, and new method of billing (like mobile van billing system) should be explored.**
- **DDG should be implemented in a much faster manner. Proper institutional mechanisms for implementing DGG must be explored. Generation Based Franchisees model-(VGF Mode- through competitive bidding) should be encouraged and State government should announce Feed in tariff for DDG projects, which will bring Private sector investment. Ministry power is encouraging renewable energy certificates (REC) trading. Business model be configured combining REC, RPO, T&D loss**
- **The Franchises are not coming up due to the Poor Hours of Supply, Poor Consumer Mix, Scattered Villages(low density), lack of accurate bench mark and base line data, commercial dispute due to contractual obligations, financial infeasibility of franchisees in rural areas. Instead having mandatory franchisees Efforts must be made to explore alternatives to franchisees in future.**
- **Effective utilization of REDB and VEI assets created under RGGVY would require round the clock supply of electricity and efficient billing and collection mechanisms in rural areas.**
- **An effective coordination mechanism is needed between Central and State Governments to efficiently utilize the RGGVY infrastructure created and to push rural electrification towards Commercial sustainability.**
- **Rural electrification planning are difficult to become financially sustainable unless these become part Of the commercial operations of Distribution Circles combining urban and rural distribution Network.**

- **National rural electrification policy should be the basis of evolving State rural electrification Policy and plan so that electricity could reach each and every household.**
- **Policy on providing subsidies for rural electrification should be clearly defined so that the Subsidies could be gradually reduced to zero as per the intent of the EA-2003.**
- **DDG based on renewable energy resources with provision to connect to the grid would be required to make these financially viable propositions.**
- **There is a need to increase economic activities in the Villages and to eliminate rural-urban divide through infrastructure development. Develop economic activities in rural areas through state intervention to make the RGGVY investment sustainable.**
- **A planned electricity supply schedule to be followed by DISCOMS and effectively communicated to villages will help improve impact of electrification.**
- **It should be made clear to village households through dissemination of information and public meeting in villages that electricity consumed by each and every one is to be paid for. Only connection to BPL families are one time free.**

Report on Evaluation of Rajiv Gandhi Grameen Vidyutikaran Yojana (RGGVY) in the state of Uttar Pradesh

Submitted to:
Rural Electrification Corporation (REC), New Delhi

Submitted By:
Integrated Research and Action for Development (IRADe), C-80, Shivalik, new Delhi.110017

Evaluation of the Rajiv Gandhi Grameen Vidyutikaran Yojana (RGGVY) Programme: State of Uttar Pradesh

REC
Endless energy. Infinite possibilities.

Submitted to: Rural Electrification Corporation (REC)

Integrated Research and Action for Development
IRADe

Submitted By: Integrated Research and Action for Development (IRADe)
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May -2012

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EXECUTIVE SUMMARY

Progress in Village Electrification:

Total inhabited villages in UP state as per 2001 census are 97,942 out of which nearly 150 stand alone villages are to be electrified through non-conventional sources of energy. Prior to commencement of RGGVY programme; 59,241 villages were electrified by March 2005. In the RGGVY programme, 27,492 villages (UE/DE) against total coverage of 27,503 villages (UE/PE) are electrified as on 30th November 2011. Free electricity connections to 8, 87, 740 nos. of BPL households were released as on November'30, 2011 against total coverage of 11, 20, 568. Balance 2, 85, 955 BPL HHS are yet be electrified. Gram Panchayat certificates under RGGVY have been issued to 27,131 villages and received by Project Implementing Agency against the revised coverage of 27,458 villages. 286 existing Sub-stations have been augmented as on 30.11.2011 out of revised coverage of 287 Sub-stations. A total new 195 Sub-Stations under RGGVY has been installed and charged against revised coverage of 207 sub-stations and balance 12 sub-stations are yet to be charged. The project "Evaluation of RGGVY Programme" in the state of Uttar Pradesh is based on survey of 25 villages in 25 Blocks in the districts of Firozabad, Mirzapur, Azamgarh, Sitapur and Pilibhit.

Planned and actual implementation period of RGGVY Projects (DPR) Issue in the Implementation:

The implementation period for RGGVY programme in Xth plan projects in a district was planned for 24 months. But none of the projects were completed in scheduled time due to various constraints. Delay in implementation of the RGGVY projects were noticed in UP state and can be attributed to several factors (a) delay in bidding process, (b) award of contract to turnkey contractors, (c) administrative constraints like delay in finalizing the list of BPL households, (d) local problems in the villages like objections from villagers with respect to location of DTRs, poles, obstructions from people of neighboring villages demanding

electrification of their villages, delays in inspection of RGGVY infrastructures by the chief electrical inspector resulting in delayed transfer of assets to the utilities and charging of villages, (e) manpower constraints of utilities for overseeing the execution of the process and even to take over the assets of completed villages after due inspection. The issue of Certificate from Village Panchayat also takes some time in some cases. The turnkey contractors had to deploy watchman to safeguard the village infrastructure and sub-stations, administrative constraints, financial constraints that the turnkey contractors have complained of late release of payments even after completion of work etc.

Duration of Power Supply per day:

Total average hours of supply are varies from 5-12 hours per day, and very less electricity is available during evening hours. Some villages in Azamgarh and Firozabad receive in the range of 2-5 hours of supply. The quality of power supply is very erratic also need to be improved substaintly in these areas. Erratic supply does not help villagers in doing productive activities as they cannot plan their activities properly. More villagers are connected in an unauthorized manner thereby making quality of supply worse as delays were observed in releasing the connection. Also because of poor supply of electricity villagers showed less interest to have a legal connections. It needs to be ensured by the Discom that a proper and effective Supply scheduled should be prepared for rural areas and if in any case there is a change in the scheduled supply hours and it should be communicated to the villagers /Sarpanch / Pradhan .

APL connections:

RGGVY focuses only on the electrification of BPL households and development of VEI in the villages to meet the demand arising from these newly electrified BPL families. However, the programme needs a strong state government scheme to support the network developed under RGGVY. Once the network is developed, then un-electrified APL households of the village would avail a legal connection. The willingness of obtaining legal connection is low among APL consumers of newly electrified villages. These APL consumers are not aware about the process and contact person of State DISCOMs to approach for availing a connection. During focussed group discussion (FGD) in the villages the APL households indicated that poor quality of supply (intermittent and low voltage of supply), poor repair and maintenance services and issues in billing. In some cases these APL consumers expressed

their anguish on issue of free connection for BPL households where as APL households has to pay for getting connection. They indicated that though the Government is asking them to provide right of way for laying HT lines through their fields and *tollas*, the Government is providing free connections to only BPL. Further, many APL households said that the disparity of income between APL and BPL is very less. Thus, they should also be issued connections in line with the BPL connections.

The cost of APL connection is approximately Rs 3000. To them initial payment is very high. In order to fulfil the vision of providing electricity for all and to revenue sustainability of rural electrification the APL connection to remaining APL consumers may be provided at a discounted rate. This is being practiced in the state of West Bengal. Central government can give certain financial support for release of APL connection, and cost of connection may be shared between state and centre.

The willingness of the APL household to get electricity connection appears to be proportional to per capita GDP of the state. The per capita GDP of UP is approximately Rupees 26000. The revenue sustainability of electricity distribution can be achieved if there is proper consumer mix, paying capacity of consumers, and the commercial aspects of distribution business are taken care accordingly. However the utility should look for the possibility of issue of APL connections in the villages where the BPL connections are being issued under RGGVY scheme. After, 12th five year plan UP is expected to be a power surplus state. This will generate and enhance economic prosperity and number of rural consumers of electricity will increase. Discoms need to carry out effective load assaessmnet in the villages and augment the Transmission and Distribution infrastructure to feed the rapidly growing load demand in Villages, as a consequence of RGGVY.

Efficacy of working of franchisee in rural distribution management metering, billing and Revenue Collection:

The metering system for the BPL households is not effective. DISCOM charges (monthly) the BPL households a fixed amount of Rs 125 for connection. In the surveyed village we observed that mostly meters are not working and consumers are paying fixed charge of rupees 125, so they are less interested in continuing with the connection. For lighting purpose they can use kerosene, available at subsidized rate from PDS. In the surveyed villages billing of consumers are not effective. Although DISCOMs normally produce bimonthly bills and distributed it to the

consumers but it reaches the villages very late. Issuing first bills also takes a long time (some cases more than Six months). This leads to the payable amount of bills becomes very high; with the result that the consumers are refusing to pay the same to the DISCOMs.

Impact on reduction of losses:

In some of the surveyed villages, revenue collection based franchisee is working and their responsibility lies only with the revenue collection for sustainability of village distribution infrastructure. Franchisee has a limited incentive to reduce the T&D losses. AT&C and other losses can be reduced by deployment of Input based franchisees model and its higher version model and appropriate capacity building. Some member felt that a code of conduct should be there for franchisee before assigning higher responsibility

Theft Reduction:

Incidence of Theft has reduced because of deployment of revenue based franchisee in some of the surveyed villages and improved rural village distribution management by the State DISCOMs where they themselves are working as a franchisee. Nevertheless, there are instances of unauthorized and illegal hooking in most of the surveyed villages.

- A planned electricity supply schedule to be followed by DISCOMS and effectively communicated to villages will help improve impact of electrification.Vigillance team should make more visit to the villages to check the theft in the villages.
- It should be made clear to village households through dissemination of information and public meeting in villages that electricity consumed by each and every one is to be paid for and only connections to BPL families are free. Innovative and proven ways of involving community should be tried.

System Strengthening by State DISCOMs:

- The State DISCOMS reported distribution losses of 27.4% percent and a collection efficiency of percent during 2008-09. They are required to reduce its distribution losses to 25.7 percent and collection efficiency level to percent 97%.
- Initiatives such as photo meter reading, theft detection drives," meter-out" programmes, implementation of HVDS and installation of separate feeders for agriculture and domestic appliances have been taken to improve operational efficiency. Metering of feeders and DTs and monthly energy accounting should be carried-out.

- Among the IT-based initiatives, the State DISCOMs should computerize its billing data and network at all its offices. Initiatives like providing aerial bunched cables (ABCs) and the replacement of old meters have also been planned. For loss reduction in other consumer categories, measures like replacement of conventional three-phase meters with static meters as well as proving metal meter boxes have been undertaken. The DISCOMs should also take initiatives in the area of metering and target to complete metering of all DTs. Among IT initiatives, the utility should undertake an end-to-end enterprise resource planning (ERP) and develop Customer relationship management module. The utility should invest for establishing baseline data and implementing IT applications for energy accounting.
- The State DISCOMS should take initiative for setting up single-pole mounted transformers, retrofitting ring main units for automation, and introducing auto-recloses and load break switches in the network. The State DISCOMs should convert LT overhead lines with ABCs cables which will reduce theft.
- Under RGGVY, the State DISCOMs should plan to provide separate 11 kV feeders to each Panchayat.
- Initiatives such as feeder renovation, setting up of anti-power theft police station and metering have contributed to loss reduction. Among IT initiatives, real-time energy accounting at the DT level; digital mapping; and implementation of the supervisory control and data acquisition, and geographical information systems should be carried-out. Moreover, the State DISCOMs should improve the HT to LT ratio in the network from 0.64 in March 2001 to 0.92 in March 2009.The State DISCOMs targets to achieve an HT-LT ratio of 1.11 by 2012.The State DISCOMs should plan to replace about 300,000 conventional pump sets, which would yield annual energy savings worth Rs.13, 497. For promoting the use of green energy, the State DISCOM plans to install solar photovoltaic power plants on the roofs of its head office and other buildings.
- The distribution infrastructure strengthening measures adopted by the state DISCOM across the country will go a long way in upgrading the ageing and weak distribution network to desirable standards so as to provide better network reliability and ensure a sustainable performance.

- For power distribution utilities, technology interventions aim at covering both company and consumer assets to make consumer load more predictable and manageable. It also has to monitor key distribution network elements including supply, metering and control. Some of the major drivers for smart technologies in the distribution are as follows:
    - Loss reduction initiatives currently implemented under the R-APDRP.
    - Cost optimization of power procurement through forecasting and controlling demand.
    - Peak load management through demand-side initiatives
    - Addressing customer service areas such as billing, outages, safety, complaints and value-added services.
    - Minimizing human interface during operations
    - Renewable energy integration, especially due to regulatory stipulations.
- Leading power distribution players point out that a typical smart grid model includes a supervisory control and data acquisition (SCADA) system for online management of network, data management system for online management up to the distribution transformer level network, advanced metering infrastructure for automated meter reading (AMR) and a consumer energy management system to address flexibility in consumer load. The case for building such systems is strengthened by the ongoing efforts towards loss reduction through IT-related initiatives.
- Environmental concerns add to the list of major drivers for smart grid technologies. T&D utilities have to meet regulatory stipulations on scheduling renewable energies in the grid power supply. The Indian Electricity Grid Code, 2010, notified in April 2010, provides specific grid code standards for integrating wind and solar energy.

Plans and Strategy:

U.P. has not notified Rural Electrification plan of the state. The plan is still in a draft stage. This is contributing to lack of direction among planners working in DISCOMs. The RE Plan is needed for a scheme of the size of RGGVY. The DISCOM authorities have indicated they have initiated feeder bifurcation plan in the state for Domestic & Commercial consumers and for Private tube well. The funding of these projects will arranged from loan from REC or PFC.

Impact of RGGVY on issue of new APL Connections and Interventions required encouraging APL consumers in availing Connections:

- No substantial impact was observed in terms of releasing of APL connection in UP as willingness among villagers are very less.
- The state REP and government orders should clearly indicate how they plan to meet the load from rural areas. APL load should be taken into account in load assessment and in the planning of development of new network.
- Utility (and franchisee, where appointed), need to lay out process for availing connections for APL. A citizen charter should be issued by state government indicating the maximum time in which connection will be issued to APL. Utility/franchisee must raise awareness amongst APL consumers on the process, charge and timeline for issue of connection. For this, boards with this information should be placed in all utility offices and sub-stations.
- Dedicated Rural Call centers should be created By UP Discoms to clarify on the issues related to electricity for rural areas (Currently it is in operation).
- Awareness should be raised amongst APL on why their bills differ from that of BPL (because of different Tariff) so that lot confusion regarding this can be removed.
- Franchisees would be keen to provide connections to APL as it would provide them with revenue sustainability. Therefore franchisees should be appointed at the earliest and given the power to issue connections.

Socio-Economic Impact of RGGVY:

The Rural electrification policy also aims to facilitate overall rural economic development, employment generation and poverty alleviation in the village. It is very crucial to understand to what extent the RGGVY programme implementation has been able to achieve this objective. The response from the villagers about the perceived benefits of RGGVY varies from district to district. Very less impact were observed across the districts due to poor and erratic supply of electricity. As far as the impact of electrification on education is concerned data suggest that there is no major impact on education, income and any other social indicators. Villagers only felt it is more comfortable when they get

electricity for running fans which give them relief during summer. Current level of electrification and quality of supply of supply is simply not enough to bring about real economic empowerment in the villages. More intensive electrification is required. However women empowerment has taken place due to RGGVY as they feel better and more secure in villages.

DPR preparation and Process:

A close scrutiny of the DPR brings many issues that may require necessary interventions. The capacity of the staffs involved in the preparation of DPR for the programme should be developed through proper training on various provisions of the programme. Proper survey should be carried out in the villages to the extent possible while preparing the DPR. The staffs have to be trained on DPR preparation, project scheduling, and project costing. Application of appropriate technology, guidelines for tender documents and execution procedures may also be included in while training the Discom employees. The supplementary DPRs for the inclusion of villages left under the programme should have been submitted and approved. Understanding that there may be some changes in the provisions of the programme during XIIth five year plan period, it is suggested that the supplementary DPRS are prepared and submitted only after the modified programme is launched with the start of the next financial year and census 2011 should be use for this. This would avoid preparation of another revised supplementary DPR for the same districts. Once the programme is re-launched in 12th plan the supplementary DPRs should be submitted in time bound manner for approval of the state government and for acceptance by REC.

Assessment of Capacity and Reach of Network, Use of HVDS and Efficacy of Installing Smaller Capacity DT

Under the scheme, it was planned to use smaller capacity DTR and this would ensure limited number of connections on one feeder. This would help identify households drawing extra load and also identify pilferage. HVDS was also to be used to reduce instances of theft. Small transformers are being used in all the villages of all the surveyed districts. However, the smaller transformers (up to 16kVA), though are better in terms of quality and efficiency, may not be suitable for rural areas. These DTs use copper core and aluminum coil and are reported to be theft prone. Also once burnt most of the cases these DTs cannot be rectified due to their lack of transformer repair workshops and needs replacement. It is also noted that DTs are not properly located and LT lines

are exposed thereby increasing possibility of the theft of electricity. This could indicate lack of understanding on part of the PIAs on distribution network configurations.

- Proper load assessment study should be undertaken in a village before developing the network.
- DTs of higher capacity may be installed at least in villages where theft of network (DTs and lines) is common and Discom should expedite the release of connection in these villages in a priority manner. The technical losses rising due to the use of higher capacity DTs will be lesser compare to the cost involved in the frequent replacement of smaller copper coil DTs.

Transformer burning, Use of HVDS and Size of Transformers:

Under the scheme (budget constraints), it was planned to use smaller capacity DTR and that could sustain limited number of connections on one feeder. But in actual the legal and illegal connection generated additional demand that was much higher than that DTR could support. HVDS was also to be used to share load reduce instances of theft. The VEI being developed in the villages is sufficient to meet the demand of BPL loads only. However, if the network is passing in front of an APL house it will be extremely difficult to prevent the household from illegally using electricity. This has impact on the distribution network and results into frequent burning of transformers.

Small (lower capacity) transformers are being used in all the villages of all the States. It is also noted that DTs are not properly located and LT lines are exposed thereby increasing possibility of the theft of electricity. This could indicate lack of understanding on part of the PIAs on distribution network configurations.

- Proper load assessment study should be undertaken in a village before developing the network.
- If DTs of smaller capacity is to be used, then proper training needs to be imparted to PIAs staff involved in distribution network development about the configuration of network and its importance. Training of Sub contractors is also important.

Decentralized Distributed Generation (DDG Scheme in RGGVY and its effectiveness):

In U.P DPRs are being prepared for DDG where there are potential for tapping the non-conventional sources of fuel .When asked both APL and BPL consumers showed their willingness to pay higher charges for assured supply especially during evening hours, the time when they are

forced to use kerosene lamps. DDG should be set up on a large scale even in areas where grid connectivity is available. Excess power from DDG should be fed into the grid. Many UP Discom are fire-fighting to operate conventional electrification scheme and less interested in the DDG project. DDG based Mini grid Potential should be assessed to find more financially feasibility of DDG projects.Generation Based Franchisees model may be devised by state regulatory commissions for better deployment of decentralized generation in the villages. Ministry of Power is encouraging renewable energy certificates (REC) trading and DDG Business model may be configured by combining with REC.

Franchisees:

The existing guideline suggests that the generator needs to be the distributor of electricity in the village. A new model may be tried where the generator may transfer the electricity to a franchisee appointed by the utility on its behalf.

- Emphasis required on making franchisee business more lucrative.
- Though training is being provided to probable franchisees in the state, training on technical aspects related to distribution business is more important
- Micro-finance may help the probable franchisee to start a business. Helping the rural youth in meeting seed money for starting franchisee activity (through programmes like jivika) may be helpful
- Utility officials need to be educated on how appointing franchisee can be useful for them in terms of reduction in T&D Losses and saving of their own manpower resources. They should be educated on how BST can be linked to reduction in T&D losses.

Comments:

The provisions in RGGVY programme that may be incorporated in 12th five year plan should focus on economic development of rural area, apart from social justice. Some of the good practices that have emerged during plan should be encouraged. The state government has initiated some these actions that can be highlighted

- Feeder bifurcation is being incorporated for rural electrification. These includes (a) for the villages (b) private tube-well. This will done with loan from financial institutions

- Preservation of perishable village outputs and production should be taken up to save from wastage and enhance economy
- Awareness drive is needed to convey message that pilferage of electricity on the long term is harmful for their own development as a community.
- Higher efficiency equipments should be used for both domestic and agricultural application.
- There have been areas/ regions where RGGVY programme in the state have been successful. These areas can be identified for special economic development.
- The rural population should be discouraged to use of heating elements/ Application and heavy duty appliances.
- DDG process conceptualization is in progress with MNRE schemes. The planning activity has started and few DPRs have been prepared under the DVVNL. Hybrids design may be encouraged to strengthen generation system

Roles and Responsibility:

Ministry of power should constitute a RGGVY centre-state RGGVY steering committee for each state, which should look in to state specific issues.Performance based fund disbursement mechanism should be devised and should be followed for ensuring the timely completion of projects in 12th Plan. The existing system of the scheme management can be augmented with higher participation of the state government; being perceived as central government scheme. Hence the implementation process is designed according to the management structure current structure of electricity board. More Decentralized approach is required in RGGVY Policy formulation and implementation. More publicity for RGGVY is required for overall benefit of the RGGVY. Grants may be converted to interest Bearing Loan in case of poor performance. The REC should give feedbacks on Cost of village electrification to MOP/MC as per the experience in the 1Oth and 11th Plan. Better matrix should be developed for arriving at the cost of electrification, State wise .(parameters like length of Ckt kilometers, average no of Dhanis per village in the state , level of electrification Per capita electricity consumption can be considered for arriving at the cost of village electrification). REC and CPSUS should share the expertise with Discoms .For State Government to bring more focus to the rural electrification rural electrification plan (REP) implementation progress should be revived Vis-visa progress through a committee chaired by energy Secretary. State government should integrate the State Rural Electrification schemes with

the RGGVY and it should integrate with the Border planning process of the State. State should conduct its own evaluation of RGGVY; through SERC to bring more sustained effort to REP. Dedicated Rural Electrification department should be created in State Energy Ministry. During consultation it was found that for long term success of rural electrification more fund are required. As the demand is growing very fast in the villages in Uttar Pradesh, system must be augmented in a proactive manner. Central Funding for this very much essential as state have limited resource available. The future funding pattern for system augmentation should have more contribution from state which will bring better ownership of the state.

Chapter 1: Study Area, Scope of Study of TORs

1.1 Study Area

Uttar Pradesh is the biggest state in India in terms of population estimated at 199,581,477 according to census 2011. The decadal population growth rate of the state is 20% and population density is 828 per square kilometer. The rural electrification programme was taken up in Uttar Pradesh on a priority basis. Being priority application the state DISCOMs had faced many challenges during execution to meet schedule within stipulated Guideline.

The project of Evaluation of RGGVY programme in the state was to be done with survey of villages and interaction with the stakeholders. All the twenty five sampled villages (scope of survey) are located in twenty five blocks of five districts. The distance between villages and district headquarter falls from 20 to 70 kms. Study was conducted in following villages which are listed in Table No.-1.

Table 1 List of sampled Villages

District	Block	Village
Sitapur	Machhrehta	Firozpur
	Gondlamau	Saraiya
	Behta	Bothawa
	Mahmudabad	Majhgawan
	Reusa	Maheshpur
Mirzapur	Mallia	Durjanipur
	Lalganj	Hardiya
	Marihan	Gorha
	Pahari	Than singh ka pura
	Rajgarh	Dhauha
Azamgarh	Ahiraula	Ashrafpur
	Azmatgarh	Gaubipur
	Koilsa	Baudiha
	Maharajganj	Arazi Hukhiya
	Tarwa	Bahorikpur
Firozabad	Eka	Bhadau
	Kheragarh	Naglakesho
	Kotla	Garhi Janu
	Madanpur	Elampur

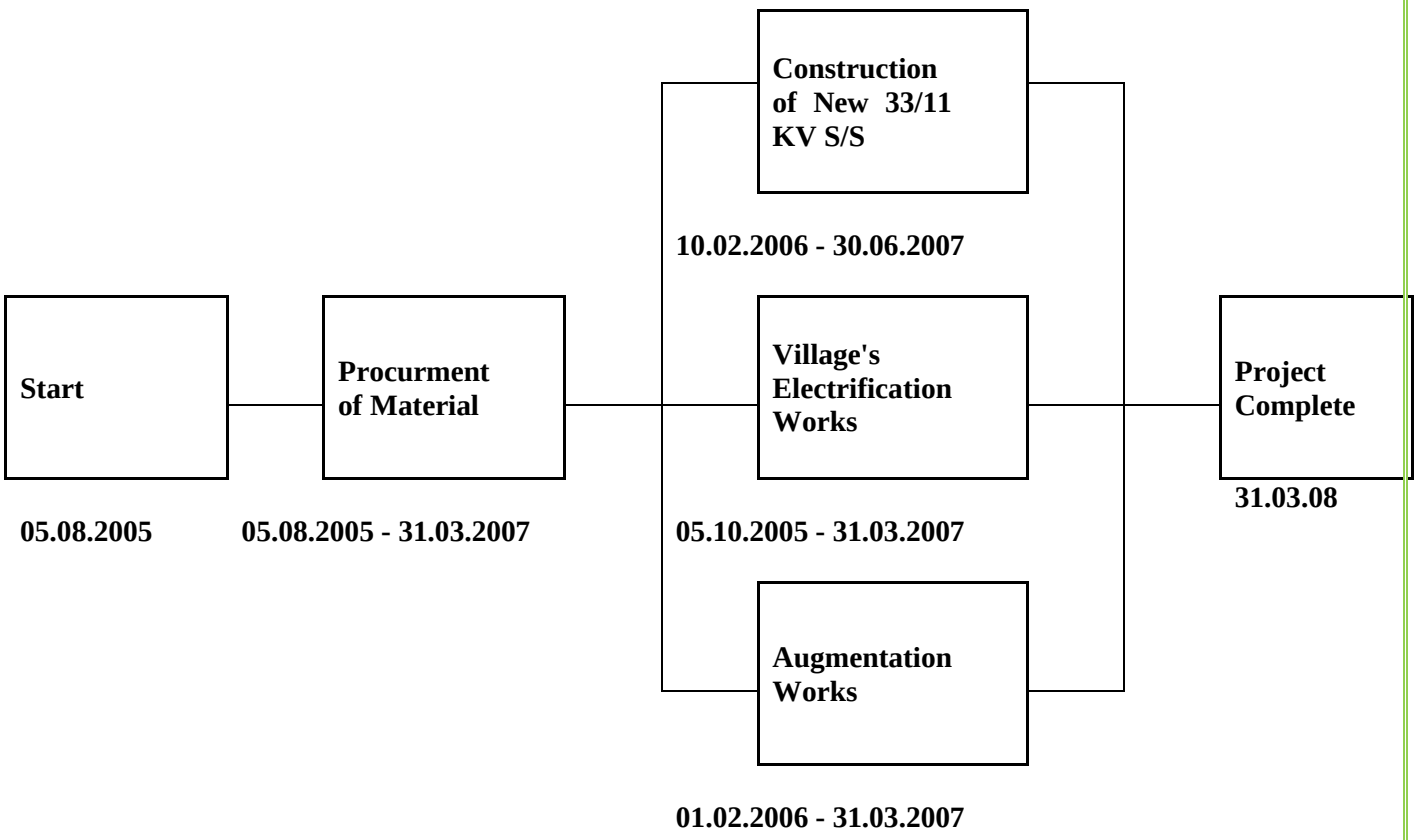
	Shikohabad	Harganpur
Pilibhit	Barkhera	Buhita
	Bilsanda	Sand Deo
	Bisalpur	Sakhiya
	Marori	Gaibojh
	Puranpur	Dunda

Rural Electrification Corporation (REC) had specified terms of References (TOR) for project analysis.

1.2 Implementation period in Uttar Pradesh State.

RGGVY programme started in the state in 2005 and was to be completed in 2008 (Figure 1).

Figure 1 RGGVY programme started in the state in 2005 and completed in 2008



However there have been spill-over in the execution in the project. In the context of the above the delay was due to allotment of land and clearance of Budget.

Chapter 2: RGGVY implementation in the State

2.1 Brief on RGGVY Xth Plan Implementation – An update

During Xth plan 64 DPRs were approved for carrying electrification work in 63 districts. A total of Rs 1,495.8 cr. were sanctioned for the execution of the projects in these districts as indicated in the table below

Table 2 Total sanctioned and awarded cost during Xth plan

Five year plan	Districts Covered	No. of DPRs	Sanctioned Cost (in RS Cr)	Awarded Cost (in RS Cr)
Xth	63	64*	2719.52	3526.97

Source: http://rggvy.gov.in/rggvy/rggvyportal/plgsheet_frameplan.jsp, last accessed on 4th December, 2011

Table 3 Village & BPL electrification target & achievement during Xth plan

Five year plan	Electrification of Un-/ De-Electrified Villages			Intensive Electrification of Electrified village			BPL Households		
	Cover-age (in nos.)	Achieve-ment (in nos.)	Achieve-ment (in %)	Cover-age (in nos.)	Achieve-ment (in nos.)	Achieve-ment (in %)	Cover-age (in nos.)	Achieve-ment (in nos.)	Achieve-ment (in %)
Xth Plan	28813	27,770	96.38	3287	2982	90.72	11,20,568	8,87,740	79.22

Source: http://rggvy.gov.in/rggvy/rggvyportal/plgsheet_frameplan.jsp, last accessed on 4th December, 2011

2.2. Implementation planned.

Ministry of Power, Government of India launched Rajiv Gandhi Grameen Vidyutikaran Yojana in 2005. In the RGGVY 10th plan the target for Uttar Pradesh is 33047 villages for electrification/Intensive electrification as Table No-.3

Table 4 Number of Villages Targeted for Electrification / Intensive Electrification under RGGVY

Name of State	No. of Un-electrified & De-electrified Villages taken up for Electrification	No. of Perviously Electrified Villages taken up for Intensive Electrification	Total
Uttar Pradesh	32519	528	33047

Implementation targets achieved.

The achievement in electrification / intensive electrification of villages in Uttar Pradesh under RGGVY 10th Plan as the Table No.4

Table 5 Number of Un-electrified/Electrified Villages where Electrification Works are completed under RGGVY

Name of State	No. of Un-electrified & De-electrified Villages where Electrification has been completed	No. of Previously Electrified Villages where Intensive Electrification has been completed	Total
Uttar Pradesh	27666	469	28135

2.3. Status of village electrification in state.

Uttar Pradesh has 97122 villages as per data available by census of India out of which 41.27 % villages are still not electrified. Table no 6 depict the Status of village electrification in the state of Uttar Pradesh.

Table 6 of village electrification in Uttar Pradesh

State	Total No. of inhabited villages as per 1991 census	Total No. of villages electrified	Balance un-electrified villages	% age of electrified villages
Uttar Pradesh	97122	57042	40080	58.73
Total (All India)	587556	474982	112401	80.80%

Balance villages are not feasible for electrification. As per the new definition of village electrification (effective from 2004-05) total number of un-electrified villages is estimated to be around 40080 in the state of Uttar Pradesh.

Table 7 Rural households electrification

State	Total No. Of Rural Households	Households Having Electricity	% Electrified House-Holds	% Un-Electrified Households

Uttar Pradesh	20,590,074	4,084,288	19.84	80.16
ALL INDIA	138,271,559	60,180,685	43.52	56.48

2.4. Investments made in RGGVY district wise.

IRADe team conducted survey in 5 districts. These districts are Sitapur, Azamgarh, Pilibhit, Firozabad and Mirzapur. District vise data related to investment made in RGGVY programme in these districts are given in table no.8. The physical progress in term of REDB and VEI in the Azamgarh, Mirzapur, Firozabad and Pilibhit district which express the No. of village electrified, New sub-station installed ,aug Sub-Station, No. of BPL connection Released and the status of Franchisee deployed in the village during RGGVY 10th Plan in Uttar Pradesh Table No.8.

Table 8 Investment made in RGGVY programme

Name of the District	Date of Sanction of Projects Under Implementation	Sanctioned Cost of U.I. Projects (in Rs.Lakhs)	Scope of Work			Name of Implementing Agency	No. of New33 KV Sub-Stations (Capacity in MVA)	No. of Augmented 33 KV Sub-Stations (Capacity in MVA)	No. of DTs (Capacity in MVA)
			Un-Electrified	De-Electrified	No. of connections to BPL Households				
AZAMGARH	**18-03-2005**	**15819.86**	**1940**	**0**	**104603**	**POWER GRID**	**10 (50.00)**	**0 (0.00)**	**6203 (68.19)**
FIROZABAD	**31-01-2005**	**2337.31**	**306**	**0**	**6539**	**DVVNL**	**5 (25.00)**	**5 (25.00)**	**1594 (15.94)**
MIRZAPUR	**25-01-2005**	**4353.36**	**605**	**0**	**6530**	**PUVVNL**	**7 (35.00)**	**8 (18.00)**	**1815 (18.15)**
PILIBHIT	**25-01-2005**	**3885.73**	**512**	**24**	**9746**	**MVVNL**	**4 (20.00)**	**3 (9.00)**	**1661 (20.11)**
SITAPUR	**20-02-2005**	**8610.49**	**998**	**0**	**83600**	**POWER GRID**	**3 (35.00)**	**5 (25.00)**	**1723 (29.54)**
Total Districts		**271951.31**	**29725**	**1077**	**1120648**		**207 (1055.00)**	**291 (943.00)**	**109944 (1365.56)**

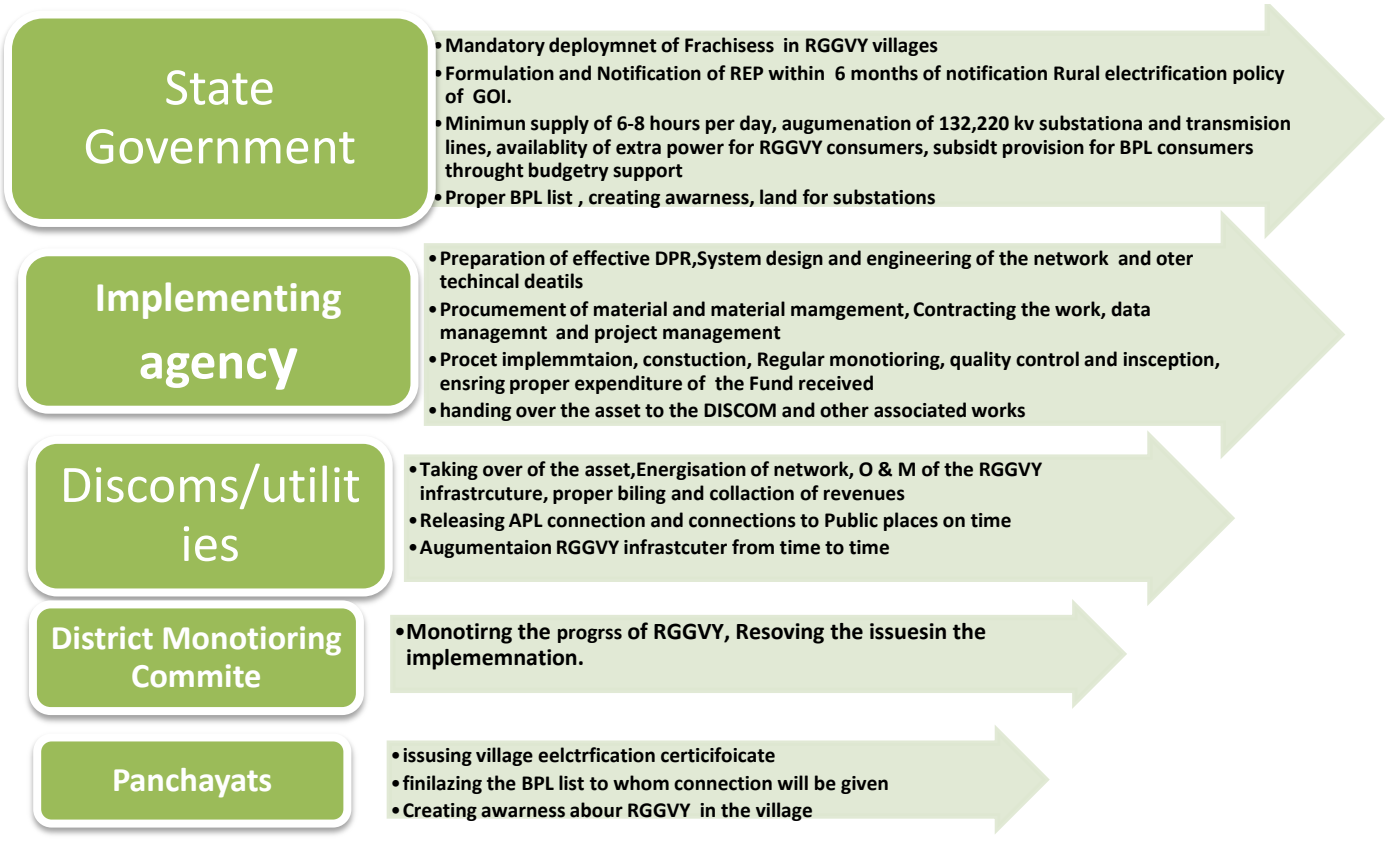
Chapter – 3

Approach and Methodology used in village survey and interactions to evaluate the effectiveness.

3.1 Stakeholders identified and their role:

There are a large number of stakeholders involved in Uttar Pradesh for the implementation of RGGVY, starting from the village level consumers to the Uttar Pradesh Power Corporation Ltd. (UPPCL) itself. However, here we will discuss the role of those stakeholders who were more closely involved with Uttar Pradesh like the State Government of Uttar Pradesh the State DISCOMs[1], the District monitoring committee, the village panchayats, franchisees and consumers. The responsibilities and roles of different agencies are show in the figure below Figure 2.

Figure 2 Different Agencies involved in the RGGVY Scheme, U.P. and their respective roles and responsibilities



[1] The DISCOMs are Pashchimanchal Vidyut Vitaran Nigam Limited (PVVNL), Meerut, Purvaanchal Vidyut Vitaran Nigam Limited PuVVNL,Varanasi, Madhyaanchal Vidyut Vitaran Nigam Limited MVVNL, Lucknow, Dakshinanchal Vidyut Vitaran Nigam Limited DVVNL,Agra

3.1.1 Sample villages surveyed in block/district:

In this report a consolidated picture is presented based on the survey conducted villages in 5 districts as listed in Table 1. The REC had mentioned terms of references in the contract. The Terms of reference was analyzed and survey component were designed. The stakeholders committed to implementation of RGGVY scheme as project managers, operation manager, maintenance manager, consumers, beneficiaries were analyzed. A detailed questionnaire was designed to capture the views of various stakeholders. These were reviewed based on terms of reference issued by REC and updated in consultation with the REC and the MOP.

3.1.2Stake holders identified and their role.

Roles and responsibilities of various agencies under RGGVY programme are as follow:

Central Government:

- Framing and notifying policy for RE.
- Sanctioning projects through the monitoring committee.
- Releasing funds (capital subsidy).
- Monitoring the programme.

Monitoring committee:

The Monitoring committee has been constituted by the Ministry of Power under the Chairmanship of Secretary (Power). It has representation from Planning Commission, Ministries of Finance, New & Renewable Energy, Rural Development & Panchayat Raj. The Monitoring committee sanctions RGGVY projects, including revised cost estimates, monitor & review the implementation of the scheme. In addition, the monitoring committee also issues necessary guidelines from time to time for effective implementation of the scheme. The Monitoring committee of RGGVY, while sanctioning Decentralized Distributed Generation (DDG) projects also coordinates with Ministry of New and Renewable Energy to avoid any overlapping of the identified projects.

State Government:

- Notify the Rural Electrification Plans in consultation with Ministry of Power and notify the same within six months of the launch of the scheme. The Rural Electrification Plan is a roadmap for generation, transmission, sub-transmission & distribution of electricity in a state, which will ensure achievement of the objectives of the scheme.Further, the states have to comply with the following conditionality to ensure proper implementation of the programme:

- ✓ State must make adequate arrangements for supply of electricity and there should be no discrimination in the hours of supply between rural & urban households.
- ✓ Deployment of franchisees for the management of rural distribution in projects financed under the scheme.
- ✓ Making provisions of requisite revenue subsidies to the State utilities as required under section 65 of Electricity Act 2003, &
- ✓ Determine of bulk supply tariff for franchisees in a manner that ensures their commercial viability.
- ✓ Provision of an authenticated BPL list.
- ✓ Enhancement of awareness on electricity related issues like generation, distribution, energy conservation & energy efficiency among elected Panchayat representatives.

Rural electrification corporation (REC):

REC is the nodal agency for implementing Rajiv Gandhi Grameen Vidyutikaran Yojna (RGGVY). All funds for the programme would be channelized through REC, which apart from the capital subsidy being provided by the government, would give the remaining funds, as loan assistance, on soft terms. The following are the specific responsibilities assigned to REC:

- Issuing all necessary guidelines to States for preparation of Detailed Project Reports (DPRs).
- Whenever necessary, assisting States in preparation of DPRs & of Rural Electrification plans by appointing consultants or by identifying a Central Power Sector Unit (CPSU) for the job.
- Scrutiny of DPRs to ensure compliance with RGGVY guidelines and with directions given by the Monitoring Committee from time to time.
- Placing DPRs for approval before the Monitoring Committee.
- Monitoring various stages of implementation right from invitation of tenders to final completion and handover to the utility.
- Preparation of model tender documents for the use of utilities.
- Preparation of specifications for various equipment's to be used in the programme in consultation with Central Electricity Authority (CEA) if necessary.
- Timely release of funds and monitoring of expenditure & utilization by utilities.
- Appointment of agencies to ensure quality control.

- Coordination with Ministry of New & Renewable Energy (MNRE) and Energy Development Agencies in states for ensuring that villages not to be covered through non-conventional means are identified for coverage under the renewable programme.
- Implementation and monitoring of the franchisees by utilities in all project villages.
- Concurrent evaluation of the scheme by independent agencies.
- Any other function assigned to it by the Monitoring Committee.

CPSUs:

The Role of CPSU is dependent on how and to what extent individual state wishes to available their services. They can ask CPSU to implement projects or provide advisory support or be involved in project monitoring and supervision. Broadly, the role of CPSUs is:

- Project Formulation.
- System Planning.
- Design Engineering.
- Procurement of goods and services.
- Construction / implementation / commission.
- Project monitoring and supervision of quality of work.

State power utilities:

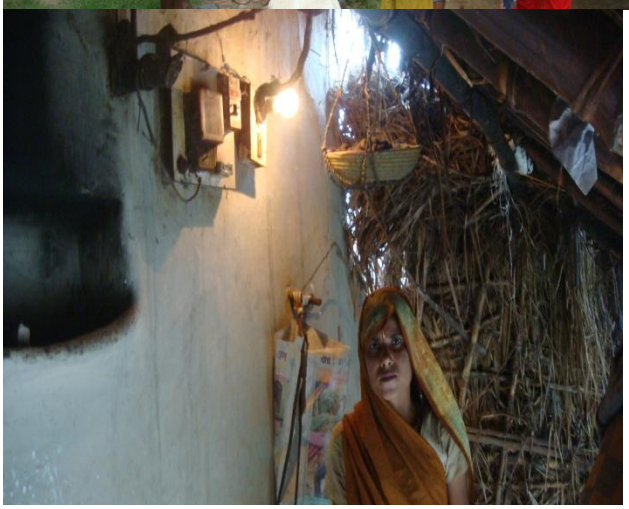
- Formulation of DPRs / Providing data for formulation of DPRs.
- Provision of additional requirement of upstream system (110, 132, 220 kV) for the project area.
- Submission of claims of implementing agencies for release of funded.
- Energization of works completed and taking over for O&M.
- Providing APL connections.

Franchisees:

Distributor of Electricity (NGOs, outsourced agencies, User Associations, Cooperatives or Individual Entrepreneurs & Panchayat Institutions).

The study employed both quantitative and qualitative approaches to collect primary and secondary data and other relevant information. Structured questionnaires were used to collect primary data from the households, formats were designed and used to collect secondary information and qualitative research tools were used to collect information from the concerned district and block officials. The qualitative research tools included focus group discussion and in-depth Interviews with state RGGVY stakeholders using issue specific checklists including review of quality of DPRs of sample districts.

RGGVY programme requires preparation of district wise DPRs. The DPRs were to be prepared by the PIA for their respective districts through the inputs gained from the state Government on the electrification status of the village and the existing network and infrastructure. Based on the inputs from the State Government, CPSU/State DISCOMs as PIAs, were prepared the district wise DPRs. The DPRs were subsequently sent through the state DISCOMs for acceptance by the State government. Once the State Government endorsed the DPRs, they were sent to the REC for the acceptance and approval by the Central Government.



It is important to note that the assessment documented in the DPR would impact proper and successful execution of the project. If the DPR prepared is not realistic or is faulty it would impact the whole work execution and may lead to time and cost overrun. Thus it is important to have competent staff, having adequate knowledge of the various provisions of the programme, involved in the preparation of DPR. Further, data and information as required should be promptly available and updated regularly. Photo below shows the BPL household is being questioned and meters are checked during the surveys.


3.2 Quality of DPR prepared:

Preliminary DPR making is initiated by the state DISCOM, based on census data. The data is shared with site engineers, for estimating the bill of the quantity. There are lots of approximation and visual estimation. The filling of REC format is another aspect, as nature of inputs, scheduling, costing, voltage drop, quality parameters etc are to be updated. They observed approximately 30% deficiency in information for DPR making as per REC format. They took assistance of Integra and Mendham as consultants to complete the DPR making.

The revised DPRs and supplementary DPRs available from the office of CPM, REC were studied for local and site knowledge and preparation of survey plans for collection of Data and information from consumers, service providers, and stakeholders.

3.3 Progress in Village Electrification:

Total inhabited villages in UP state as per 2001 census are 97,942 out of which nearly 150 stand alone villages are to be electrified through non-conventional sources of energy. The number of villages through grid electrification remains 97,792.Prior to commencement of RGGVY programme, 59,241 villages were electrified by March 2005. In the RGGVY programme, 27,492 villages (UE/DE) against total coverage of 27,503 villages (UE/PE) are electrified as on 30th November 2011. Total number of Rural Households including BPL HHs is 9,00,618 including total BPL households and free electricity connections to 88,7740 nos. of BPL households were released as on November'30, 2011 against total coverage of 1,12,0568. Balance 2,85, 955 BPL HHs are yet be electrified. Gram Panchayat certificates under RGGVY has been issued to 27,131 villages and received by Project Implementing Agency against the revised coverage of 27,458 villages. 286 existing Sub-stations has been augmented as on 30.11.2011 out of revised coverage of 287 Sub-stations. A total new 195 Sub-Stations under RGGVY has been installed and charged against revised coverage of 207 Sub-stations and balance 12 Sub-stations are yet to be charged.

Table 9 Discom wise, Implementing Agency wise, Achievement of electrification of villages & Households under RGGVY-X Plan (Numbers)

No	DISCOM	Village Electrified	BPL HH Electrified
1.	PVVNL, Meerut	1780	11,493
2.	PuVVNL,Varanasi	7938	1,07,306
3.	MVVNL, Lucknow	7479	1,69,667
4.	DVVNL,Agra	4728	1,17,995
A	Sub-Total DISCOMs	21,925	4,06,461
5.	PowerGrid	5,834	4,94,157
B	Total-UP	27,759	9,00,618

Chapter 4 Status of Village Surveys and Interaction with Stakeholders

4.1 Evaluation of APL/BPL households:

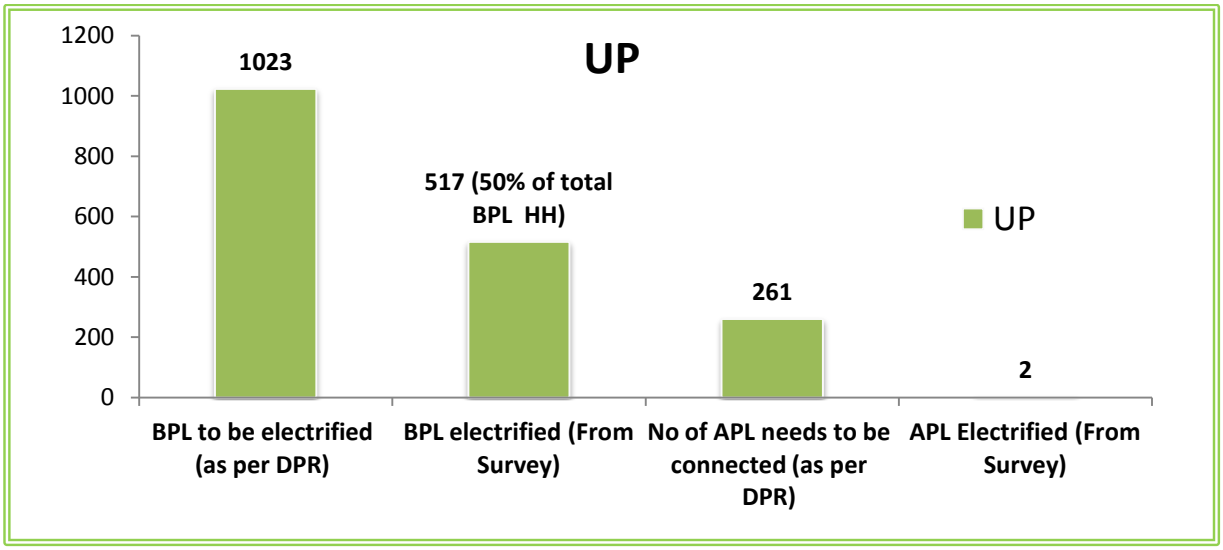
During survey 2559 families were contacted that formed the sample size of the report. The sample comprised of 1023 BPL listed as per the DPR and 1536 APL families.

Table 10 Evaluation of APL/BPL households in Surveyed Villages

Districts	Total no of RHH	BPL Families	BPL HHs Electrified	APL Families	APL HHs Electrified
Azamgarh	429	166	120	263	0
Firozabad	992	343	189	649	0
Pilibhit	429	197	72	232	0
Mirzapur	207	75	21	132	2
Sitapur	502	242	115	260	0
Total	2559	**1023**	**517**	**1536**	**2**

The total 2559 households (BPL+APL), are present the surveyed villages. Only 20.28 % of them (RHH) have been electrified through RGGVY. There are still a large number of rural households left out who should be electrified in an accelerated manner to sustain the progress of rural electrification. By the current definition of village electrification, there have to be a minimum of 10% village household which are electrified. If the left out villagers are not electrified in a progressive manner, then cases of electricity theft might increase substantially and infrastructure overload might occur causing significant damage, since the current capacity of the infrastructure will not be able to meet the demand. Progress of APL connection can be seen as very bad in UP. As per the Scope of the work (as per DPR) was 100% needed to be electrified. Out of the total 1023 BPL households, 517 households have been electrified i.e. only 50.58% BPL families were covered. Regarding APL connections, out of 1536 APL households only 2 APL connections had been released. This has been shown in Table- 11 whereas around 10-20% APL households had been surveyed, all the BPL households were covered within the study.

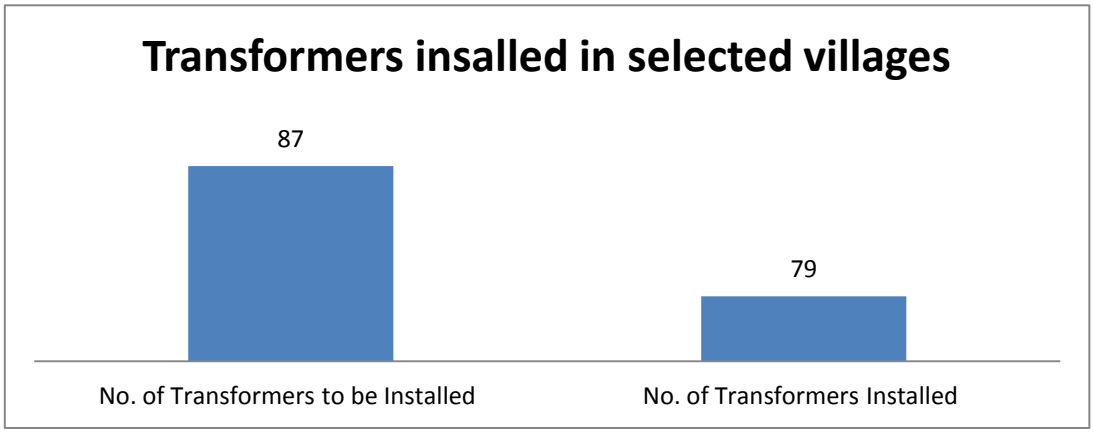
Figure 3 Status of BPL and APL connection in surveyed villages in Uttar Pradesh and Percentage of Rural household



4.2 REDB and VEI in villages surveyed:

In most of the surveyed villages the RGGVY project has been executed properly as per the DPR. Coverage of Village Electrification Infrastructure (VEI) was found to be commendable as many Dalit Hamlets are also been electrified. But total no of transformer that was proposed by the Discom were reduced due to the financial implications. On an average 5 no of distribution transformers were proposed by the Discom, and it was reduced to 3 numbers per village. It was observed that since REC has to cover all the villages so they have to reduce the infrastructure requirement per village. Although it is a good strategy under the financial constraints but it has created problem at the village level as many habitants still do not have access to electricity.

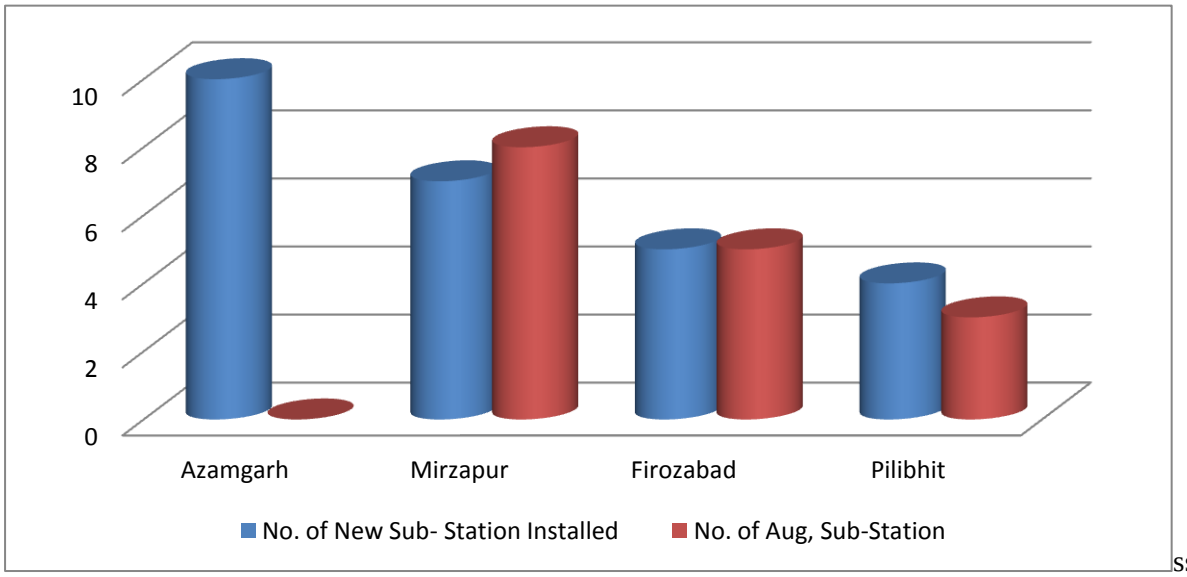
Figure 4Transformer installed and Average KW available Per HH



The transformer is the most crucial equipment in village electrification infrastructure. In UP in most of the districts, DPR are prepared by taking an assumption of 60watt of household demand.

BPL household actually demand much more than the 60watt demand assumed. In the village surveyed, as per the DPR, 87 transformers of 10 and 16 KVA were to be installed out of which 79 transformers had already been installed. If we take a power factor of .8, then all the transformers combined, can manage a load of 670 KW, which comes to around 1.2 KW per household*[2]. The survey shows that the average load of households (both APL and BPL) comes to around .4 KW in UP (may be more as one household is often connected to many other households) which is less than the available capacity of 1.2 KW capacity available. Although by this calculation we can see that the transformer is adequate enough to cater to the demand but nevertheless a large number of transformer failures occur due to the overloading. This corroborates the fact that there are substantial numbers of households without an official electricity connection, who get themselves unauthorized connections to the Village Electrification Infrastructure and start drawing power, creating a huge pressure on the transformer. This fundamentally highlights the fact that the current definition of village electrification i.e. minimum 10% rural household electrification needs to be relooked. On an average it was found that around 30 to 40 % unauthorized connections exist these villages.

Figure 5 the No. of Aug Sub-Station and New substation in the concerned district under the RGGVY program



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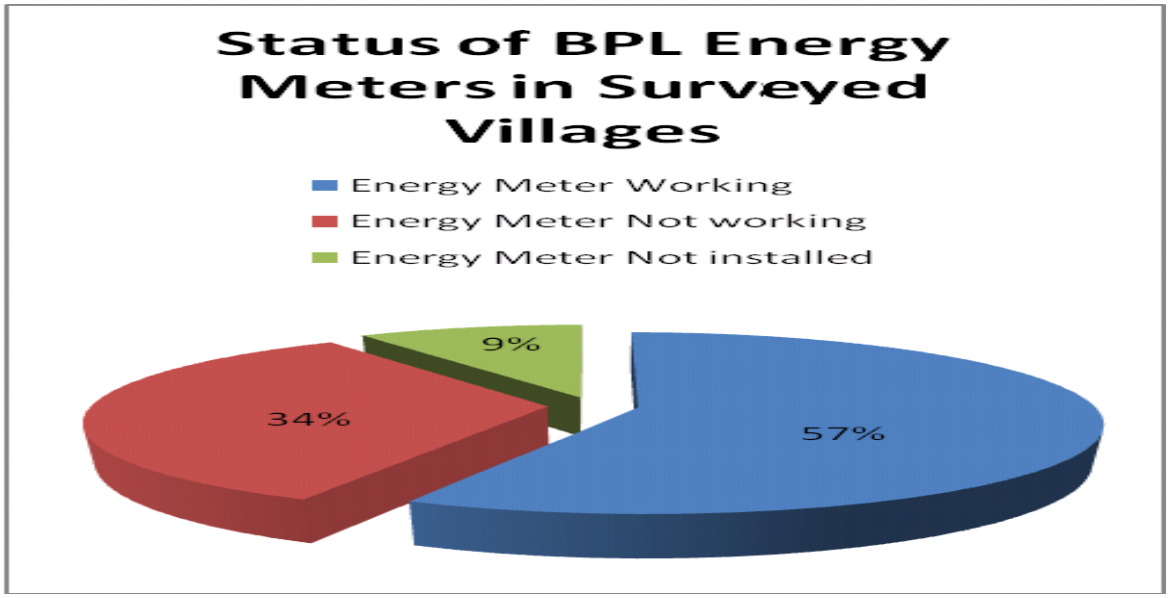
4.3. Quality of infrastructure created and quality of Coverage:

Village infrastructure was inspected as per the drawings and it was found that the village distribution infrastructure has been created in accordance with the design and DPR except for few minor deviations. Most of the projects were conceived in 10th five year plan, when there was no

[2] * no of BPL +APLhouse hold connected (519)/ 670 KW=1.2 KW Per HH

comprehensive monitoring but in the 11th plan it is much improved through the three tier quality monitoring. The DISCOMs have followed monitoring of commissioned infrastructure during 11th plan. The RITES and Voyant solutions are assigned the task of monitoring the infrastructure. Due to the quality monitoring, the quality infrastructure created in the villages are good expect in few cases. Certainly this is not same in all the districts of UP and also varies from one contractor to the other. The quality of the infrastructure is very good in the surveyed villages; expect for a few cases where a structure had not been installed properly. The quality of coverage of household by created distribution infrastructure was found to be very good, except for the places where habitants have taken unauthorized connection. The network was laid out in such a manner that it could provide connections to all the households of the villages. It was observed that almost 30-40 % of the meters were either not working or damaged or were found to be tampered with.

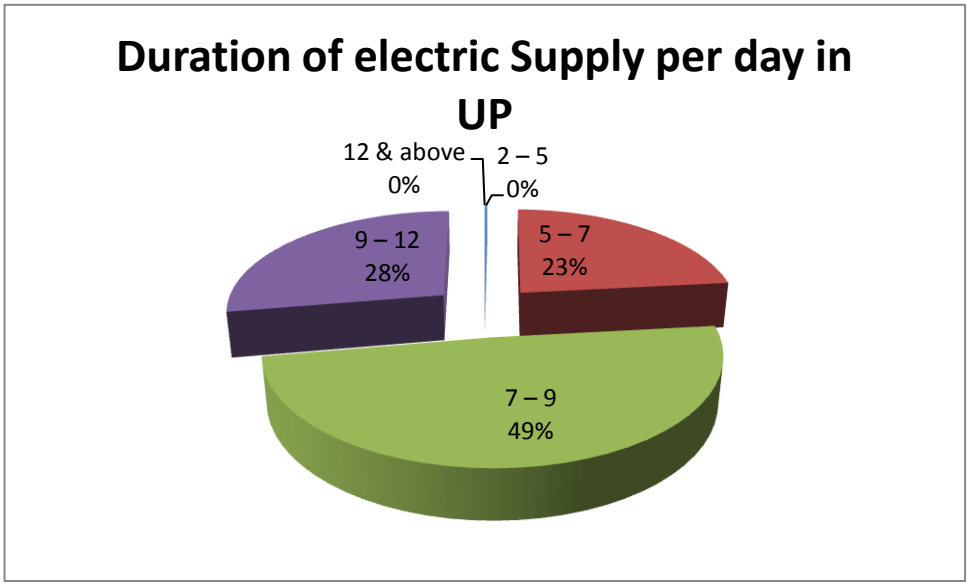


It is very essential to devise a proper plan for maintaining the RGGVY infrastructures in a proper manner, particularly in the meters. It was observed that since most of the cases meters are not functioning properly, Average billing is done for these consumers. Photos below shows the meters are damaged and moved out by the villagers.

4.4 Duration of electric Supply per day in Uttar Pradesh:

There are wide variations in terms of electricity supply available to villages in UP. It varies from a minimum of 5 hours to as high as 12 hours of supply. The number of hours supplied in all the surveyed villages in UP is shown in the pie chart below. Majority (49%) of the villagers got 7-9 hours of supply while around 28% of them got 9-12 hours of supply.

Figure 6 Electricity received by the Consumers in the surveyed villages



Although 49% villagers in UP gets 7-9 hours supply, these hours of supply are not fixed (time of supply) and are very erratic in reality. Villagers assert that the unreliable supply of electricity is of no use to them as they cannot plan to do any productive work. A continuous nature of supply is very essential to ensure the sustainability of rural electrification. In some villages, issues of electricity governance have taken an unexpected turn as villagers struggle among

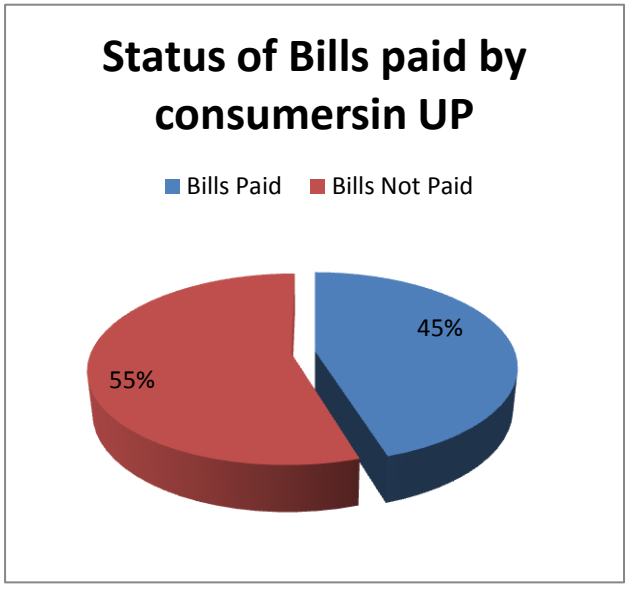
themselves to get electricity by cutting supplies to different Majras of the village and by manipulating the electricity network for their own use. Villagers sometimes also change the location of the transformer as per their benefit and convenience. It was observed that supply during evening hours is very poor in most of the villages and villagers demanded that there should be minimum 3-4 hours of supply during evening hours.

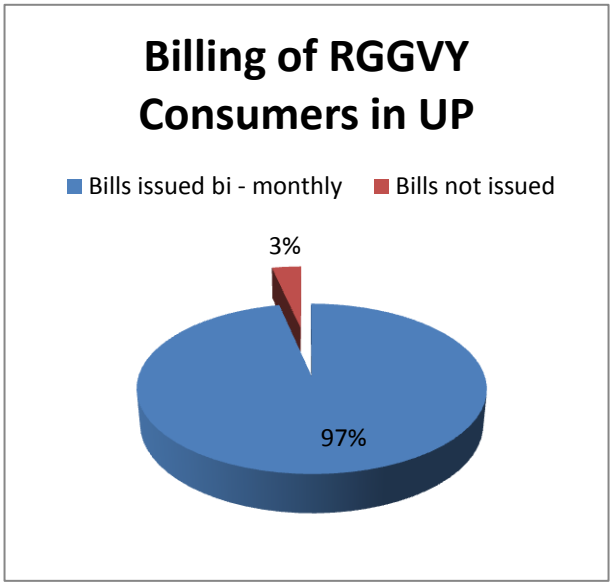
It needs to be ensured by the Discom that a proper and effective supply scheduled should be prepared for rural areas. In case there is a change in the scheduled supply hours it should be communicated to the villagers /Sarpanch / Pradhan . It can be communicated directly to villagers as well. A minimum 6-8 hours of supply needs to be guaranteed specifying the time of supply as otherwise, there is not much utility for the villagers.

4.5. Billing and Revenue collection of RGGVY consumers:

For revenue sustainability and also for the sustainability of the infrastructure, it is very important to properly bill all the RGGVY consumers and also collect the bills from them. Although it was envisaged to do it through the deployment of franchisees, they did not come up in most of the RGGVY villages. Under this context, it is very important to understand to what extent the billing and collection is taking place in villages. In the surveyed villages it was found that 97 % villagers received the bills from the Discom in a bi-monthly manner.

Figure 7 Billing and Revenue collection in UP





Close to 3% of household had not received any bills. It should also be noted that although many people were receiving bills bi-monthly, it took almost 1-1.5 years in some cases to issue the first bills. This leads to large outstanding bills as villagers are not able to pay aggregated first bill.Also

many of the bills were issued on an average basis and proper meter reading based billing was not done. This created lot of concerns among the villagers/consumers that they were getting bills amounting to much more than what they were consuming. Because of these reason many villagers did not like to pay the electricity bills. In few villages it was found that although electricity was not available for several months, because of technical difficulties, they still continued to receive bills. There is a grave need to improve the billing quality and make it more realistic. Villagers also complained about the improper billing and there is a need to create awareness about electricity tariff to the villagers.

More than 55% villagers paid the electricity bills in a regular manner in UP. They generally walked over to a bill collection centre or camp which was organized by the Discom from time to time. Although bill payment was very good, the number of consumers with outstanding bills is also very high, with sums in the range of 1200-8000 Rupees. This was mostly due to the delays in issue of initial electricity bills which eventually came as an aggregate for the entire period in the end, making it very difficult for the households to pay these huge bills. It is imperative to solve this issue of large outstanding bills Otherwise households face the risk of getting disconnected. It may be done by consulting with the villagers and apportioning the sum with the monthly bills. 45% villagers did not pay electricity bills. The reasons for non-payment were mixed (a) due to the lack of money; (b) one of the reasons given by a villager of Durjanipur Village in Mirjapur district of UP was that nobody paid the electricity bills because they thought that under RGGVY, both the connection and the electricity was free for them. This was communicated to them by person who gave them the connection. It is very important to let them understand that electricity is not free since this assumption resulted in a lot of unauthorized connections in the village. It was found and observed during the interaction and survey; villagers preferred paying their bills rather than getting disconnected. They realize the importance of electricity and its need in their day to day life. For example charging mobile phones is one of the most important requirements for electricity. In villages where there was no electricity or very less electricity, villagers travelled to other villages to charge their mobile phones, even paying 5-10 rupees each time for charging the mobile phones. This indicates that the quality of billing and collection should be improved for the sustenance of RGGVY.

4.6. Dis-connection of BPL connections:

No dis-connections had been found in surveyed villages of UP. However a large number of consumers faced a huge risk of disconnection as their outstanding bills were very high. Although people did pay electricity bills, their consumption was very high, leading to large outstanding bills. BPL households are averse to paying Rs 125/- for unmetered billing. Also, physical

disconnection was also expected, since in many cases meter are not installed in a proper places, and in many cases outside the house in Baithak chabootara.

4.7. APL connections and augmentation of infrastructure:

Only 2 APL connections released in the surveyed villages of UP. If other APL consumers applied for connection than augmentation of infrastructure will be required in the future. Camp approach by Discom should be tried for releasing connection to the APL households. In UP very few villagers apply for the connection due to lack of affordability and willingness. Due to supply shortage, Lack of manpower and Poor Financial Health of the Discom , delay takes place in releasing the new connection. In most of the villages transformer capacity needs to be augmented before releasing new connections.

Chapter 5: Economic status of households in villages surveyed:-

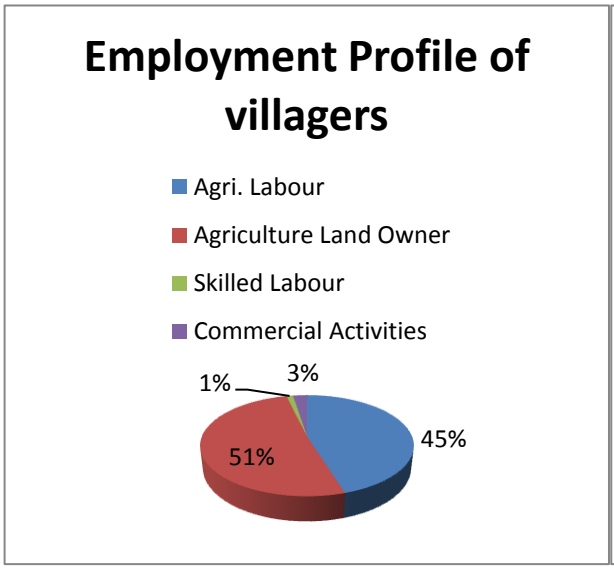
5.1. Employment Profile

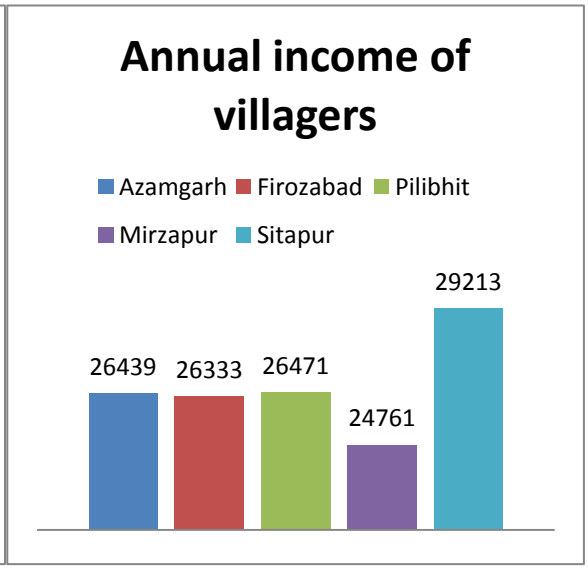
The occupational status of the households is given in Table 11. The table shows that majority of the respondents (56.11 percent) are engaged in cultivating their own lands. It needs a mention here that in cases where the family is engaged in cultivation, the whole family has some contribution and all are either full time or part time occupied in agricultural activities. Over the last few decades, the problem of under employment or disguised unemployment has become chronic in the country. Other than cultivators, 49.63 percent of the respondents are agricultural laborers and another 1.30 percent work as skilled laborers. 2.78% people were also engaged in commercial activities like Shops and business.

Table 11 occupational status of the households

Occupation	Azamgarh	Firozabad	Mirzapur	Pilibhit	Sitapur	Total
Agri. Labour	28	153	11	25	51	**268**
Agriculture Land Owner	90	96	6	46	65	**303**
Skilled Labour	2	0	1	1	3	**7**
Commercial Activities	3	0	1	0	11	**15**

Figure 8Employment Profile and annual income of villagers (district wise in the surveyed villages)



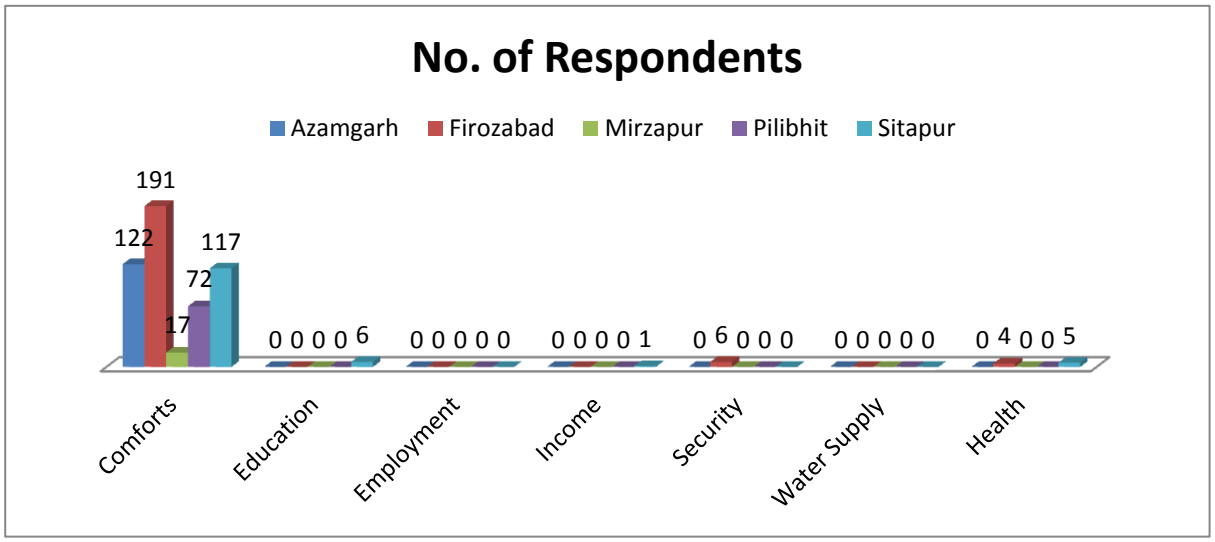


On an average, the income of BPL and APL families came out to be Rs. 26,643 Rs per year. Rural Income in Sitapur district was estimeted to be highest approximately Rs 29213 per year (Fig-8). Mirjapur was district reporting very low levels of income Rs. 24761. Most of the districts are found to be backward districts as far as the income of households in concern.

5.2. Impact of RGGVY:

The Rural electrification policy also aims to facilitate overall rural economic development, employment generation and poverty alleviation in the village. It is very crucial to understand to what extent the RGGVY programme implementation has been able to achieve this objective. The response from the villagers about the perceived benefits of RGGVY varies from district to district.

Figure 9 Socio-Economic impact of RGGVY



As far as the impact of electrification on education is concerned data suggest that there is no major impact on education, income and any other social indicators. Villagers only felt it is more comfortable when they get electricity for running fans which give them relief during summer.

Schools are not electrified in any sample villages. Power supply in the villages varies in day to day basis. Power is generally not available at the time of studies that is at evening. Only 1.10 % families feel some benefit in child education from electricity.

Figure 10 socio-economic impact in percentage terms

DISTRICT	More Comfort	Better Education	More Employment	increase income	More security	Water supply	Better health

	%(total HH surveyed	%(total HH surveyed	%(total HH surveyed	%(total HH surveyed	%(total HH surveyed	improved %(total HH surveyed	%(total HH surveyed
Sitapur	90.69	4.65	0	0. 128	0	0	3.88
Mirzapur	100	0	0	0	0	0	0
Firozabad	95.02	0	0	0	2.99	0	1.99
Azamgarh	100	0	0	0	0	0	0
Pilibhit	100	0	0	0	0	0	0

There are no new Employment opportunities due to the electrification. The current level electrification and poor quality of supply is simple not enough to have employment generation and socio-economic development in the villages. Also, income of the villagers due to RGGVY had not increased substantially; However, if was found that approximately 0.13 % (Sitapur District) villagers responded affirmatively to increases in income due to electricity as they were using electricity in activity like tailoring. It is very interesting to note that 3.88% villagers in Sitapur district felt that their health had improved due to electricity. They said that due to the use of mobile they can call the doctor in emergency situation.

5.3. Awareness of RGGVY:

During the survey it was also observed that implementing agencies of RGGVY have installed their sign board of RGGVY programme in the villages but only 22.59% families were aware of the name of the programme, rest of the 77.41% families who got electricity connection from RGGVY programme were not aware about this scheme. But all these families are aware that they got electricity connection because they have BPL card with them. They know RGGVY scheme as BPL electricity scheme.

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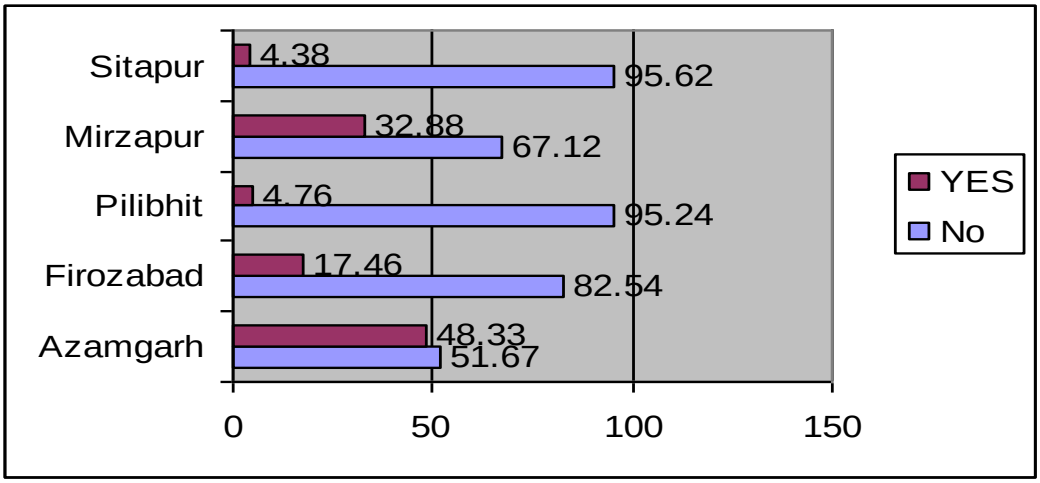
Figure 11 Awareness of RGGVY



5.4. Empowering women:

As far as women employment is concern no major impact found in sampled villages. As data suggests from Table no 13; 60.24 % women of sampled villages are involved only in managing home. Around 33.47 women involve in agricultural activities. Around 3.75 % women involve in skilled labour and 2.54 % women are managing flour mills in sample villages.

Table 13 Empowering women (in percentage)

Employment	Azamgarh	Firozabad	Pilibhit	Mirzapur	Sitapur	Total
Managing Home	27	83	81	82	96	**60**
Mn'g Agri. Labour	7	17	10	18	4	**10**
Mn'g Agriculture	48	0	10	0	0	**23**
Mn'g Flour mill	7	0	0	0	0	**3**
Skilled Labour	10	0	0	0	0	**4**

5.4.1. Impact of RGGVY on women on quality of life in villages, & safe living:

Decline in crime rate/theft instances were reported by 30.71% beneficiaries (Table 14). 10.30 % women felt safer at night.

Table 14 Impact of RGGVY on women on quality of life in villages, & safe living

Safety	Sitapur	Mirzapur	Firozabad	Azamgarh	Pilibhit	Total
Decline in crime rate/Theft instances	13.28	11.76	7.69	47.54	43.06	30.71
Children do better in study	0	0	0	0	0	0
Feel safer at night	4.68	11.76	6.67	20.49	16.67	10.30

5.4.2. Impact of RGGVY on community health, women employment and rural industry:-

Community Health

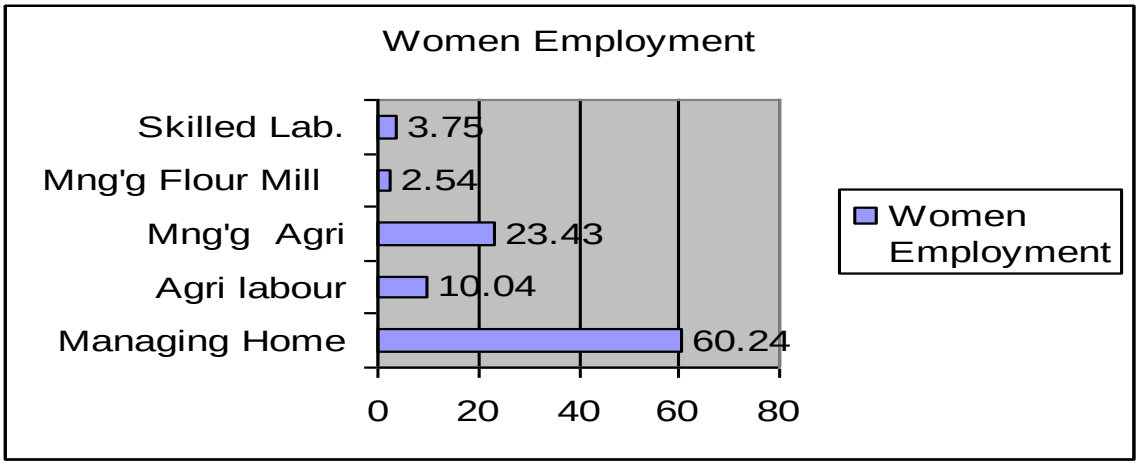
There is not a single primary health center (PHC), sub center (PHSC) or community health center (CHC) in sample villages. Health services largely depend on Registered Medical Practitioner (RMP) and Jholachhap doctors in these villages. For better treatment villagers either go to block health center or district health center. Most of the block health centers are not electrified yet. As reflected above in pie diagram No. 2 only 2% families told that due to mobile services they can call private doctors RMPs in emergency situations.

Women Employment

As far as women employment is concern no major impact found in sampled villages. As data suggests from Table no 15 60.24 % women of sampled villages are involved only in managing home. Around

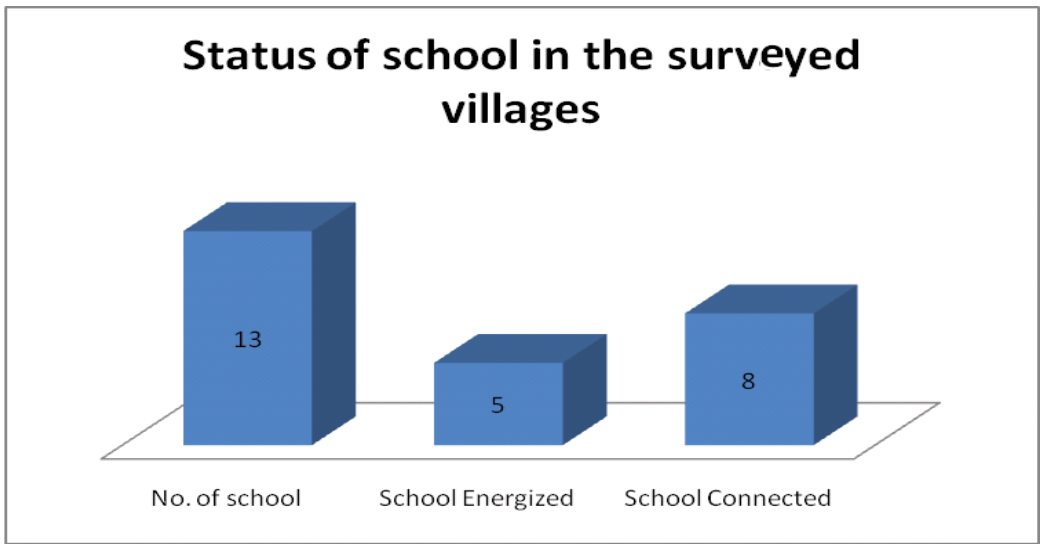
33.47 women involve in agricultural activities. Around 3.75 % women involve in skilled labour and 2.54 % women are managing flour mills in sample villages.

Figure 12 Women employment, benefits received



5.5. Public Places Electrification:

Out of 13 schools in the sample villages, only 8 were found electrified out of which only 5 were energized. However, some Temples do have a connection but it is not metered. In the household survey, among the total number of school going students 232 were boys and 169 were girls. Students felt a benefit of having electricity in schools, particularly during the summer days, as fans provided them additional relief in the summer while studying.



5.6. Industrial activities/ Commercial activities initiated due to RGGVY in villages:-

In all the surveyed villages, no industrial activities were found. In Sitapur district only one household a tailor running his shop in his house said that after getting electricity he motorized his weaving machine which made his job much easier.

It was observed that the current level of rural electrification has to be intensified- to be pursued more aggressively. The rural community produces mainly perishable commodities, they is highly susceptible to market demand and consumption. Rural electrification can protect perishable items. The rural Industry will demand reliable power supply to maintain healthy production cycle. Industrial activities and the commercial activities must be encouraged in the villages which are essential for the long term sustenance of village electrification through better accrual of revenues.

5.7. Standard of living in villages:-

Above data suggest that 46.09% families are using more that 2 light bulbs and 18.15% families are using fan. Only 12.96% families are having television in their household. A significant percentage (42.96%) of families are using mobile phones due to electrification. 35.96 % families are using one mobile phone and 7% families are using more than one mobile phone. These data clearly suggest the inclination in the living standard of the villagers.

5.8. Growth in Electricity Demand in Villages from Year of Recognition As Electrified Villages:-

Electricity demand in the villages is expected to increase with improvement in village economy, and reliability of power supply particularly after RGGVY. It was disclosed by the Discom utilities, that the average demand growth in the villagers is around 8-9% per year. There is also lot of unmet demand due to lack of reliable electricity in the villages. Consumer load growth in rural area will occur rapidly over time, hence overall T&D system needs to be strengthened and improved to cater to the demand. Since the state funds are limited and financial health of Discom is poor, the central government may provide loan to these states government at concessional rates for strengthening the system

5.9. Load demand at village levels and use of HVDS distribution: -

In general the average populations in UP villages are relatively higher than other states. They asked for 5 transformers for village electrification, but received permission for three transformers to design village electrification Cost of village electrification permitted were 7.5 lakhs per village. For APL connection load state DISCOMs were asked to arrange fund for their own end. Reference to

technical aspect they desired Voltage regulation scheme in the distribution line. But they were asked to limit overdesign, and reduce cost per length of line. Demand estimates are clouded by Pilferage and mis-use are there, and they are using electricity for un-necessary application. These activities results in damage of transformer. State has upgraded the consumer redressal system with establishing a toll free number. Where the consumers can register their complaint. DISCOMs try to resolve transformer problems in 7 to 15 days. The relocation of transformer is also a problem as villagers try to shift the transformer location. The fig below shows the shifting of transformer by villagers without the proper approval from the Discom. In the surveyed villages no irrigation Pump set and no heavy duty Electrical machine working only BPL/APL consumers observed in the surveyed village.

HVDS has been implemented in all the villages' surveyed despite improper Geographical location & right of way of issues. It has helped in giving **better quality of power** as villagers experienced. Particularly for far-off Dhanis, it is very effective. but some time excessive transformer capacity are deployed (16 KVA transformer for 2-3 HH). Although HVDS is better but long length of 11kv Lines and more no of small transformers are difficult to maintain and look after. Despite the Limitation of HVDS it should be continued in the next plan as Well as benefits are more than the drawbacks.

5.10 Issues in RGGVY implementation Process and comments and suggestions on the effectiveness of the strategy adopted:

Rural Electrification Corporation had specified norms of implementation schedule. The state had specified the same in the DPR. The state had prepared DPR for all villages having population more than 100 households. The Implementation schedule can be viewed in three components (a) installation of Substation: The installation of substation including civil work takes around 6 to 9 months. The main constraints are land allocation. In UP it takes about 6 month. (b) Erection of HT and LT lines: this takes about 3 to 6 months depending upon the distance. Here the mail reason of delay is routing that may be due to agricultural land with crops, truant landholders, or forest department clearance (c) Providing connection to BPL households: This takes around 15 days for a village. A village consumer electrification task is conducted by a gang of 5 (1 diploma holder and 4 laborers). Depending upon the number of villages the contractor deploys the number of gang for village electrification.

UP DISCOMs had assigned the contract to experienced contractors. Then there are series of sub-contacting. The equipments supply may be from established manufacturers but the work execution is done by local hand, whose experience may be limited. In this mode of working finishing quality gets affected. The contractors do not respond to the defect lists that are minor in nature. They make their margin in main equipment supply. This imbroglio continues and contract period gets completed.

Hence the issue needs to be taken care of in the contract. The delays causes cost over-run (a) project management cost gets extended (b) risk of asset increases (c) administrative charge increases.

There is Four Key issue in project executions

- DPR Preparation / Process
- Certificate From Village Panchayat
- Coordination and Administrative delays
- asset handover and transfer of asset to Discom

IRADe team analyzed all the above 4 issues in detail and through the inputs received from the various stakeholders following changes are suggested for effective implementation of RGGVY in future.

Table 15 DPR Preparation and ASSET handing over and taking over

Issues	Observation	Suggestion
DPR Preparation	**1. DPR was Prepared during a small time.** **2. Although DPR is made as per Guidelines, Quality of DPR is not very good.** 3. **Proper load assumption is not done**	**1. Proper Training for DPR preparation** **2. It DPR should be prepared Based on accurate information to the extent possible.** **3. Sample survey must be conducted to collect data.** **4. Expert agency may be involved in DPR preparation** **5. DPR cost should be Part of RGGVY funding.** **6. CPM office should have adequate Staff to verify DPR** **7. GIS may be used DPR preparation.** 8. **New DPR should use Census 2011 data.**

ASSET handover and transfer of ASSET to Discom	❑ **Delay is observed in UP.** ❑ **Discoms are not interested in taking over the asset.** ❑ **Discom takes long time for inspection(limited Staff)**	1. **DISCOM must finish inspection with 15 days.** 2. **Findings of the inspection should be known to PIA within a week.** 3. **Any delay in this; it will be assumed that inspection is over.** 4. **PIA can issue the user certificate.** 5. **Discom must make available adequate staff for this** 6. **In Rajasthan and Gujarat DISCOM checks for data completion with Sub-contractors and organizes a camp.**

The **DPR** should be made much more accurately to the extent possible and proper surveys must be carried out. Proper survey should be carried out to ensure the assumptions are much more realistic. A small survey should be carried out to get the real picture and proper demand estimation. DPR preparation cost should be part of the RGGVY funding. Adequate time should be given to prepare the DPR. **Handing over asset** guidelines need to be more comprehensive. State DISCOM should not delay the taking over of asset. If state wants electrify BPL on their own with improved armored cable which not as per REC specification, then on this ground taking over should not delayed. State can take over the asset and then release the connections. By and large REC standards and Specification should be followed uniformly. During the discussion this point was highlighted.

Issues	Observation	Suggestion
Certificate From Village Panchayat	1. **Certificate from village panchayat is important.** 2. **Sarpancha are not aware about the process.** 3. **There are cases where sarpacha has pressurized to release connection to non-BPL (UP)**	1. **Panchayat must reply with in the 20 days of receive of certificate format (it must be local language).** 2. **Certificate format may be send through courier from PIA.** 3. **In case of delay , BDO may be the alternative**

		authority to issue the certificate
Co-ordinations and Administrative delays	❑ **Delay is due to administrative delay.** ❑ **Lack of adequate staff is the a major problem** ❑ **The right of way creates a problem. In some cases, intervention of DC is also solicited**	**1. Create dedicated rural electrification department.** **2. Involve young engineers of Discom in RGGVY implementations.** **3. Proper training regarding RGGVY** 4. **Forest clearance should be done separately by Discom.**

It was observed that the long term success of rural electrification and the success of the implementation of this programme depended very heavily on the initiatives that the States take, the facilities that they can offer the availability of contractors locally and some construction materials. Under this context more responsibility should be given to the states to implement RGGVY in an effective manner. In respect to providing BPL connections, there is a requirement for BPL lists, which are not readily available always. BPL lists should be made available timely, by the district authority. **There should** be proper documentation of the whole RGGVY implementation in a very effective manner so that everything is monitored properly, which sometimes are not being done in case of DISCOMs. Milestones wise monitoring is hardly followed in the by REC as it can only be done with proper documentation.

Long term Sustainability of Rural Electrification in UP:

There should proper development rural industrial units like food processing, cold storage, micro Diary industries, cottage industries which will enhance the paying capacity of rural consumers. It also very essential to educate the villagers about the importance electricity saving and reduce the unknowingly misuse of electricity. A lot of awareness about this is required and respective panchayats may be the appropriate institution for doing awareness camps on electricity. This awareness is very important as this help in changing the mindset of the people. Electricity should be looked as enabler for rural development.

Since power supply to rural consumers is a loss making proposition for DISCOM thus there is less and limited incentive for the DISCOM to serve rural consumer particularly in power deficit scenario.

The central government may devise a mechanism by which it will allocate un-utilized power of NTPC at cheaper rate to state government by emphasizing this will be provided to the rural areas where the incidences of load shedding in the rural areas are high. The Detail mechanism can be devised in proper consultation with the all the stakeholders.

-

Rural Electrification Plan in U.P.:

The RGGVY guidelines mandate the state governments to prepare, in line with the Electricity Act, 2003 (EA 2003) and Rural Electrification Policy (REP) 2006 of the Central Government, a Rural Electrification (RE) plan for the state. The State Government was supposed to notify the plan within six months since the issue of office of Memorandum on RGGVY issued in February, 2008. The plan was supposed to be a blue print of the state government on its rural electrification strategy.

The plan would indicate the way in which the state plans to augment its generation capacity or the sources from which the state plans to procure power necessary to meet demand arising from rural areas. The plans should also be a roadmap for augmentation of upstream distribution network and intra state transmission network so that upstream network has sufficient capacity to meet upcoming/ future demand from rural areas. The documents should focus on strategy that the state plans to adopt in-order to ensure revenue sustainability from rural areas including road map for adoption & propagation of franchisee institutions, a mandate under RGGVY programme. The strategy focusing generation of electricity from renewable sources in off grid connected villages and its distribution to rural consumers was also to be a part of the plan. This would ensure that off grid rural consumers gets sufficient power as per the demand.

However, U.P. has not notified RE plan of the state. The plan is still in a draft stage. Lack of proper laid out strategy impacts the work execution for any project. This is particularly true for a scheme of the size of RGGVY. During visit in the villages it was found that supply hours in villages are inadequate. Supply during peak hours is very restricted which rules out the benefits that may be accrued to the villagers with extended hours of working. There has been delay in the issue of new connections to non BPL consumers. The network being developed through RGGVY is not being supported with augmentation of distribution infrastructure. Thus, the health of distribution infrastructure in rural areas has deteriorated. A planned infusion of resources, for augmentation of distribution infrastructure through state government, would have provided the requisite impetus to the effort made in rural areas.

State government has initiated Feeder bifurcation, which is being incorporated for rural electrification. These includes (a) for the villages (b) private tube-well. This will done with loan from financial institutions

The rural electrification Plan to be drafted by the Uttar Pradesh Power Corporation Limited for the twelfth plan should address Subsidy issue. Subsidy is needed. The purchase cost of electricity in the state is approximately Rs 4 while they provide electricity to rural consumer at Rs 1.

Stakeholder Analysis and comments

Ministry of Power:

Rural Electrification Policy was notified in 2006. DPR passed by monitoring committee. Monitoring committee meeting was conducted regularly. Program was reviewed and modified in for the 11th Plan. Progress is good in term of BPL electrification, but still target may shift as 72% BPL is connected against the target.

There should be RGGVY center-state RGGVY steering committee, which should look in to state specific issues.Performance based fund disbursement mechanism should be devised and followed for ensuing the timely completion of projects in 12th Plan. More Decentralized approach is required in RGGVY Policy formulation and implementation. More publicity for RGGVY is required for overall benefit of the RGGVY.Grants may be converted to interest Bearing Loan in case of poor performance.

REC:

Good Progress is made despite different constraints. Quality of RGGVY infrastructure is proper in most of the villages REC should improve more upon its quality monitoring and qualified people should visit the villages for inspection. The REC should give feedbacks on Cost of village electrification to MOP/MC as per the experience in the 1Oth and 11th Plan. Better matrix should be developed for arriving at the cost of electrification, State wise.(parameters like length of CKT kilometers, average no of Dhanis per village in the state , level of electrification Per capita electricity consumption)REC and CPSUS should share the expertise with Discoms . REC **as a part of its *CSR can take of some renewable energy projects in selected RGGVY Villages*.**

State Governments:

A state government has to full fill the Conditionality of Tripartite agreements signed REP should be notified within six months from the date of notifications it was found - Bi-monthly Review

meetings were Held by GoUP in regular interval. Franchisee Deployment is very poor. State REP implementation progress should be revived Vis-visa progress through a committee chaired by energy Secretary. Integrated the State Rural Electrification schemes with the RGGVY and it should be part of Border planning process of the State. State should conduct its own evaluation of RGGVY , through SERC.To bring more sustain effort to REP , dedicated Rural Electrification department should be created in Energy Ministry, Discom ,SERC.Department should look in to the issue of Franchisees, DDG, in more detail through proper research.Create Rural electrification fund for proper maintenance of rural infrastructure

District Monitoring committee and Panchayat

DMC –Needs more capacity and expertise in implementing and monitoring RGGVY at the district. Regular meeting needs to be conducted. As role of DMC are very important for long term sustenance of rural electrification.DMC should devise strategies for energy efficiencies in rural areas .Sarpanch must certify after observing necessary condition of village electrification. Awareness should create among Sarpach regarding this. Is required and within 2months from the receive of the notice, comments should be given or Certificate should be issued by Sarpanch to PIA

Chapter- 6 Decentralized Distribution Generation (DDGs)

Uttar Pradesh has planned to electrify villages both through the extension of the grid and also through the non grid schemes. It has planned to electrify many villages though non-grid method. The strategy and plan to electrify the villages by non grid will be worked out by U.P State Government in collaboration with the NEDA.

Nodal Agency in Uttar Pradesh has submitted solar system based renewable energy system (DDG) DPR for installation in Hamirpur, Lalitpur, Lakhimpur Kheri, Bahreich, Sonbhadra districts. These are pending with REC. Uttar Pradesh has good resources for bio-mass that can be used for energy purposes.

To estimate the potential of DDG scheme, the state DISCOM may plan for pooling of power at district level and if feasible at block level. The estimate of deficit in the power demand at block level may A detailed DPR compiled on a cluster of villages should be worked out in timely manner by the respective state nodal agencies for implementing DDG, which is UPSERC/UPREDA. A proper mix of technology should be worked upon in the DPR, after a proper resource assessment of the locality.

Many UP Discom are fire-fighting to operate conventional electrification scheme and less interested in the DDG project. DDG based Mini grid Potential should be assessed to find financially feasible DDG projects.Generation Based Franchisees model-(VGF Model, charged Grid tariff – Rest as Supported by Subsidies- SERC) should be devised by state regulatory commissions. Ministry of Power is encouraging renewable energy certificates (REC) trading and DDG Business model may be configured by combining with REC.

1. Institutional arrangement for implementing, operating and maintaining the DDG should be clearly marked out. As from the interaction, it was observed that the DISCOMs were not interested in operating and maintaining the system, even after five year of successful operation by the developer. A holistic view must be taken in this direction as it will address the Public–Private partnership structure of the DDG which provides long term in built incentives for the project developer throughout the life of DDG rather than just for five years.
2. If the DISCOM shows their aggressiveness to implement DDG, then VGF model should be pursued in a proper manner.
3. The current DDG scheme is not very encouraging for the entrepreneurs to be involved in as there are no sufficient incentives for them to participate in the scheme.

Instead of simply involving the private party as developer for five years, a long term partnership should be created with the private partner.

Chapter- 7.0 Franchises in operation

7.1. Franchise model operating in the state.

For revenue sustainability, management of rural distribution through franchisee is prerequisite under Rajiv Gandhi Grameen Vidyutikaran Yojana. Franchisee may be an entity empowered by the state to either develop / operate a generation & distribution system or ready to distribute electricity within an identified contiguous area for a prescribed duration and collect revenues directly from rural consumers. The different type of franchise models are proposed under in the RGGVY program. In Uttar Pradesh State the franchise modal deployed by all the discom for rural areas which is Revenue Franchisee- collection based. Such Collection Franchisee would be appointed for an area and be given a target for revenue collection every month which depends on the baseline collection in the area. The total number of franchises in the state is 505.

The remuneration methodology involves:

a) Paying the franchisee margins (which will be a percentage of collections) on achievement of the target,
b) Levy of penalty for not achieving the target
c) Incentives for exceeding the target.

7.1.1. Franchisees models proposed under RGGVY scheme

There are several models available for franchises, but only two out of six i.e. revenue collection and Input based out of them may be effective they are

- **Revenue Franchisee- collection based**

This kind of franchisee may be developed with the intended role limited to billing, revenue collection, complaints redressal, facilitating release of new service connection and keeping vigil on the status of distribution network in the franchised area for providing appropriate feedback to the utility. Such Collection Franchisee would be appointed for an area and be given a target for revenue collection every month which depends on the baseline collection in the area. Drawback of this system is that the franchisee is not a partner in loss

reduction since its compensation is linked to the revenue collections made and not on the energy input coming into the area. This model is thus not preferred for adoption.

- **Revenue Franchisees Input based**

In case of the input based franchisee, the input energy into the area covered by the franchisee is measured by the utility and the target for revenue collection are set based on the collections made as a percentage of the input energy supplied to the consumers beyond the point of metering by the utility.The operations and remuneration methodology of the input based franchisee is similar to that of the collection franchisee. The basic difference is in the target setting mechanism by the utility.

The input based franchisees area may be decided based on:

- Energy supplied by the utility through 11 kV feeder(s) as a point / location of measurement of energy supplied to franchisee and will need a metering unit in the individual 11 kV feeders.
- Above system can also be distribution transformer wise located in the villages having smaller area of franchisee operation.

The additional advantage of this method as compared to the collection franchisees is that the franchisee also becomes a partner in loss reduction and tries to reduce theft in the system. It would be better to start with revenue collection models and scales it up in due course to other models like input based franchisee and O&M franchisee. This would give ample scope to understand the problems and finding solutions for them before graduating to a higher model.

7.1.2. Franchisees models proposed under RGGVY scheme and Status in U.P.

There is only one revenue collection based franchise model being in operation in State. The status of no. of revenue collection based Franchisees; no. of RGGVY villages covered under operational franchisee in the State, DISCOM-wise, in the surveyed districts. Franchisees in present form are not viable. There is cost of franchisee in terms of Labour, and as a business he is expected to make reasonable profit. Who will sustain the franchisee within existing

accrual revenue? If the franchisee is given responsibility of one feeder or one substation he has to employ minimum of 5 to 6 persons. Considering the revenue aspect, they have assigned Torrent as franchisee of Agra circle. There they have also faced resistance. Public acceptance of Franchisee is needed. Some of the experimented Franchisees have started acting as super-power. Hence code of conduct of franchisee should be incorporated in the Franchisee contract. Considering cost-effectiveness, a methodology be devised for subsidizing Franchisee. The level of education and skill of the younger generation is enhancing as government is providing more facilities and opportunities through programme. In future optimum size Franchisee will be successful. A viability gap based funding mechanism should be developed for rapid deployment of franchisees in the villages. Under current financial circumstances it is not financial feasible to deploy franchisees in all the rural areas a lot more trainings to done for larger acceptance of franchisees in rural areas as well as by Discoms employees. Payment of electricity Bill is a issue with the rural consumers. They find down payment of Rs 125 high, and unaffordable. Hence many BPL do not opt for electricity connection. They find payment of 4 to 5 liters kerosene at subsidized rate more cost effective. The reason for their not paying as per meter was not explainable (Rs 15 fixed + Rs 1 per unit).

SURVEYED DISRICT-WISE:

STATE DISCOM	District/Project under RGGVY	No. of RGGVY villages covered under Operational Franchisee
Madhyanchal VVNL	Sitapur	
Poorvanhal VVNL	Mirzapur	439
Poorvanhal VVNL	Azamgarh	4
Dakshinanchal VVNL	Firozabad	0
Madhyanchal VVNL	Plibhit	0

STATE DISCOM-WISE:

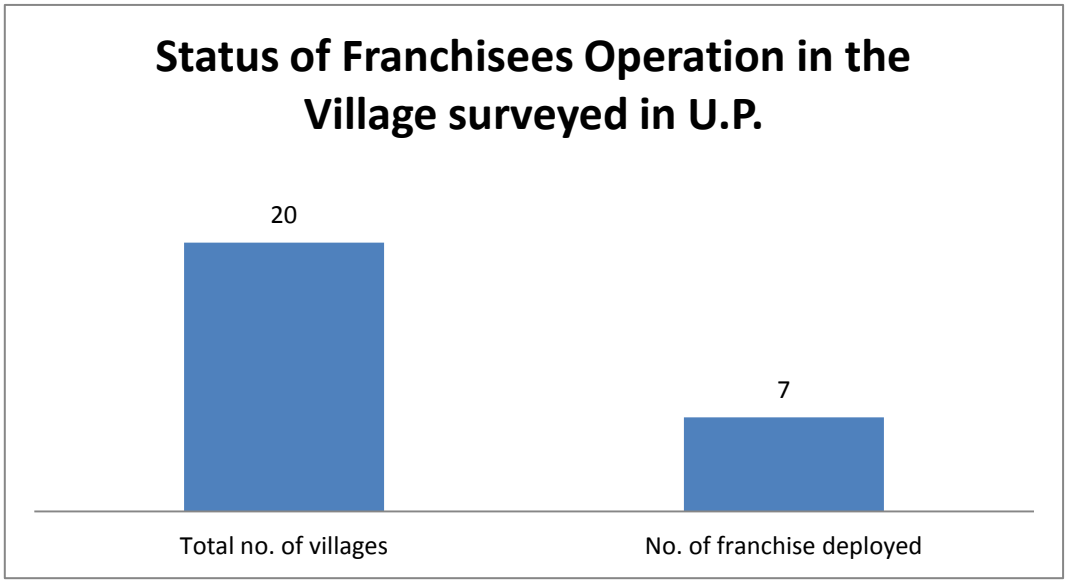
State DISCOM	No. of franchisee operational	No. of RGGVY villages covered under Operational Franchisee	Total No. of RGGVY villages covered under Operational Franchisee
Madhyanchal VVNL	33	119	1768
Paschimanchal VVNL	31	540	1893
Dakshinanchal VVNL	256	2098	9820
Poorvanhal VVNL	35	282	1077

STATE-WISE:

Total villages covered in the state	Villages covered under RGGVY	Village covered under non-RGGVY	Total no. of villages under franchisee	Franchisees established in RGGVY villages as on 31.12.11
30,741	3739	14,626	18,365	478

In the study villages, there was 7 deployment of franchise. They distribute the bills and collect the revenue and done the meter reading in the villages. The respective DISCOMS have started the process of finalizing the deployment of franchisees.

Figure 13 Status of Franchisees Operation in the Village surveyed in U.P.



Improved franchise models being planned in the state.

The Franchisee initiative involving Public Private Partnership (PPP) model across the State is stated to have shown encouraging results such as increased revenue, collection, consumer satisfaction as franchisee is involved in repairs, proper billing and employment generation. There should be effective capacity building programmes of franchisees, consumers associations and Panchayat Raj associations in a more aggressive manner. During interaction with the employees insides the DISCOMs, certain reluctance towards franchisees was perceived, which needs to be addressed in a proper manner.

Chapter-8 Recommendation for better & effective implementation of RGGVY:

- Since already a huge amount of rural electricity distribution infrastructure has been created, a specific and appropriate plan should be prepared by the State Government for maintenance of infrastructure. The REC, Hyderabad office is organizing training on the operation and maintenance of infrastructure. Sustainability of rural electricity infrastructure is the bigger concern as many villages do face the risk of de-electrification in future.
- The project implementing agencies (contractors) have utilized local personnel for execution of programme. A process may be organized to organize them into franchisee model envisaged.
- Prepare DPR with proper survey and census data of 2011 for future implementation RGGVY in 12th plan. Most of the DPRs will be supplementary DPR. Separate guidelines may be issued by REC for supplementary DPRs. In future most of project will focus on augmentation and separate feeders for agriculture and commercial application.
- UPSERC should rationalize the bulk supply tariff for rural consumers. Under the State Rural Electrification Policy, the tariff structure of the state should be suitably modified to provide for a separate Bulk Supply Tariff applicable solely for franchisee operating in declared rural areas for sustainability of rural electricity infrastructure and franchisee.

  No franchisee will be able to sustain without a commercially viable revenue model. Focus should be on optimizing revenue collections using a mix of loads (domestic, agricultural, commercial and industrial).Increasing area of coverage by a given franchisee will help in increased volume of revenues. It is desirable to adopt an outsourcing model for limited range of services. It would be better to start with revenue collection models and scale it up in due course to other models like input based franchisee and O&M franchisee for power distribution in rural areas with incentives to attract the entrepreneurs to make an investment in franchisee business. This would give ample scope to understand the problems and finding solutions for them before graduating to a higher model.

- Accurate billing based on meter reading should be expedited. The billing for un-metered consumer should be fixed at the level below the five liter kerosene cost at PDS prices.
- Potential of DDG should be harnessed. Proper institutional mechanism for implementing DGG must be explored by integrating it with RGGVY -DPR.
- Effective utilization of REDB and VEI assets created under RGGVY would require round the clock supply of electricity and efficient billing and collection mechanisms in rural areas.
- An effective coordination mechanism is needed between Central and State Governments to efficiently utilize the RGGVY infrastructure created and to push rural electrification towards Commercial sustainability.
- Rural electrification plans are difficult to become financially sustainable unless these become part of the commercial operations of Distribution Circles combining urban and rural distribution network.
- National rural electrification policy should be the basis of evolving State rural electrification policy and plan so that electricity could reach each and every house hold.
- Policy on providing subsidies for rural electrification should be clearly defined so that subsidies could be gradually reduced to zero as per the intent of the EA-2003.
- DDG based on renewable energy resources with provision to connect to the grid would be required to make these financially viable propositions. The DDG potential should be harnessed in view for energy security in future.
- There is need to increase economic activities in the villages and to eliminate rural-urban divide through infrastructure development. Develop economic activities in rural areas through state intervention to make the RGGVY investment sustainable.
- A planned electricity supply schedule to be followed by DISCOMS and effectively communicated to villages will help improve impact of electrification.
- It should be made clear to village households through dissemination of information and public meeting in villages that electricity consumed by each and every one is to be paid for. Only connection to BPL families one time free.

- Preservation of perishable agri-product should be given highest priority. Post harvest wastage should be minimized drastically. Planning of these infrastructure may be done on separate feeders.

System Strengthening by State DISCOMs:

- Increasing power availability requires minimizing losses at the distribution end and ensuring financial stability of the DISCOMs. The DISCOMs need to take the necessary steps to upgrade their networks, reduce energy losses and enhance distribution efficiency. The DISCOMs need to formulate a capacity expansion plan considering load forecast for the next five years. They are required to add more number of sub-stations, HT lines, distribution transformers & LT lines. Few thermal power plants are in the status of being commissioned in twelfth five year plan. UP may be a power surplus state in future. They need huge investment on the augmentation and expansion of their infrastructure.
- Initiatives such as photo meter reading, theft detection drives," meter-out" programmes, implementation of HVDS and installation of separate feeders for agriculture and domestic appliances have been taken to improve operational efficiency. Metering of feeders and DTs and monthly energy accounting should be carried-out.
- Among the IT-based initiatives, the State DISCOMs should computerize its billing data and network all its offices. The State DISCOMs should also reduce their aggregate technical and commercial (AT&C) losses. The new investments should focus on controlling distribution and AT&C losses to enable the DISCOMs put up a better financial performance. To reduce distribution losses at the rural consumer category level, which accounts for the largest share in total losses, the utility is undertaking close monitoring of high-loss feeders. Initiatives like providing aerial bunched cables (ABCs) and the replacement of old meters have also been planned. For loss reduction in other consumer categories, measures like replacement of conventional three-phase meters with static meters as well as proving metal meter boxes have been undertaken. The DISCOMs should also take initiatives in the area of metering and target to complete metering of all DTs. Among IT initiatives, the utility should undertake an end-to-end enterprise resource planning (ERP) and a customer

relationship management module. The utility should invest for establishing baseline data and implementing IT applications for energy accounting.

- The State DISCOMS should take initiative for setting up single-pole mounted transformers, retrofitting ring main units for automation, and introducing auto-reclosers and load break switches in the network. The State DISCOMs should convert LT overhead lines with ABCs.
- Under RGGVY, the State DISCOMs should plan to provide separate 11 kV feeders to each Panchayat.
- Initiatives such as feeder renovation, setting up of anti-power theft police station and metering have contributed to loss reduction. Among IT initiatives, real-time energy accounting at the DT level; digital mapping; and implementation of the supervisory control and data acquisition, and geographical information systems should be carried-out. Moreover, the state discoms should improve the HT to LT ratio in the network from 0.64 in March 2001 to 0.92 in March 2009.The state discoms targets to achieve an HT-LT ratio of 1.11 by 2012.The state discoms should plan to replace about 300,000 conventional pump sets, which would yield annual energy savings worth Rs.13,497. For promoting the use of green energy, the state discom plans to install solar photovoltaic power plants on the roofs of its head office and other buildings.
- The distribution infrastructure strengthening measures adopted by the state discoms across the country will go a long way in upgrading the ageing and weak distribution network to desirable standards so as to provide better network reliability and ensure a sustainable performance.

- For power distribution utilities, technology interventions aim at covering both company and consumer assets to make consumer load more predictable and manageable. It also has to monitor key distribution network elements including supply, metering and control. Some of the major drivers for smart technologies in the distribution are as follows:

- Loss reduction initiatives currently implemented under the R-APDRP. The DT located at the entry point of village may be provided with smart meters to monitor unauthorized consumer of electricity.
- Cost optimization of power procurement through forecasting and controlling demand at the block level.
- Peak load management through demand-side initiatives
- Addressing customer service areas such as billing, outages, safety, complaints and value-added services.
- Minimizing human interface during operations
- Renewable energy integration, especially due to regulatory stipulations.

- Leading power distribution players point out that a typical smart grid model includes a supervisory control and data acquisition (SCADA) system for online management of network, data management system for online management up to the distribution transformer level network, advanced metering infrastructure for automated meter reading (AMR) and a consumer energy management system to address flexibility in consumer load. The case for building such systems is strengthened by the ongoing efforts towards loss reduction through IT-related initiatives.
- Environmental concerns add to the list of major drivers for smart grid technologies. T&D utilities have to meet regulatory stipulations on scheduling renewable energies in the grid power supply. The Indian Electricity Grid Code, 2010, notified in April 2010, provides specific grid code standards for integrating wind and solar energy.
- Awareness drive is needed to convey message that pilferage of electricity is bad on the long term basis. Prospect of village de-electrification and impact on education of children should be highlighted.
- Higher efficiency equipments should be used for both domestic and agricultural. Feeder network should be designed to facilitate use of pump-set approved by Bureau of Energy Efficiency.

  Consumers should be discouraged to use of heating elements/ Application. Awareness drive is needed on explaining the misuse of electricity and its results

Report on Evaluation of Rajiv Gandhi Grameen Vidyutikaran Yojana (RGGVY) in the state of Assam

Submitted to:
Rural Electrification Corporation (REC), New Delhi

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Evaluation of the Rajiv Gandhi Grameen Vidyutikaran Yojana (RGGVY) Programme: State of Assam

REC
Endless energy. Infinite possibilities.

Submitted to: Rural Electrification Corporation (REC)

Integrated Research and Action for Development
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Executive Summary of Evaluation of the "Rajiv Gandhi Grameen Vidyutikaran Yojana (RGGVY) Programme": State of Assam

Progress of village electrification as per the approved DPR including revised DPR:

The report on assigned project of "Evaluation of RGGVY Programme in the state of Assam" is based on survey, of 25 villages; in 25 blocks; in five districts; of Assam. The five districts are Dhubri, Karbi Anglong, Tinsukia, Dibrugarh, Lakhimpur. The districts Tinsukia, Dibrugarh, Lakhimpur are known for their tea gardens; however the population of the villages surveyed, were primarily engaged in agriculture. The RGGVY programme has been able to build a good quality infrastructure to sustain electricity supply for the rural Area, under multiple challenges faced by the state. The large percentage of marginalized population of the state has been provided electricity connection free of cost. The RGGVY project for Tinsukia was initiated in tenth plan, and other districts were included in 11^{th} plan projects

Of the survey sample of 25 Assam villages, 32% of the total number of rural households (APL and BPL) had been connected via RGGVY. There were 1513 BPL households within the sample, of which 675 (45%) have been electrified. Among APL households, only 3% of the recorded 642 APL households; 22 households had access to electricity from RGGVY infrastructure.

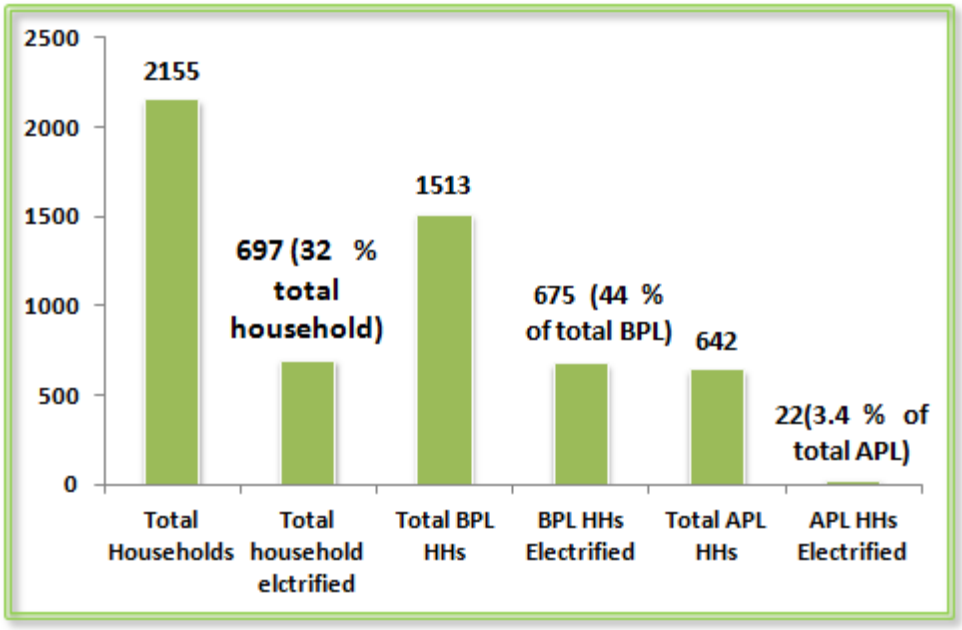


Figure 1: Status of RGGVY in surveyed villages in ASSAM

Of the five districts surveyed, we observed that only 4 out of the 20 public places had taken electricity connection. Growth of load demand for most of these surveyed villages is very unlikely, population in these villages are low, and earnings of people are comparatively low.

To clearly list various Governments and their agencies responsible for the numerous tasks to successfully implement the RGGVY projects.

APDCL has got a separate rural electrification wing headed by a chief general manager with a full-fledged office having head quarter at Guwahati. The office the General Manager (GM), is looking after the contract allotment including tendering and evaluation / monitoring, and also routine progress in all the projects and future programme. They have appointed AGM (REM) for each district to coordinate the implementation of rural electrification project. He facilitates charging the line and commissioning of substations. He provides enabling facilities to the contracting firm, and is responsible to connect the existing infrastructure to the new infrastructure, and coordinates backward linkages constraints; without adequate support staff. The existing programme management can be augmented with higher participation of the state government; being perceived as central

government scheme. The implementation process may be designed according to the management structure of electricity board.

Of the five districts surveyed, in four districts, DISCOM, ASEB is implementing the RGGVY programme. Electrification of Dibrugarh district is being executed by PGCIL (CPSU). Three villages, out of 5 surveyed villages in the Dibrugarh, are yet to be electrified. Three tier quality monitoring mechanism for XI Plan Schemes have been reporting quality of implementation. Their defect list is attended to by both PIA and DISCOM. Installed VEI appeared to be in good condition. Numbers of Consumers have in side house wiring done without energization.

To study the RGGVY DPRs and assess whether DPRs have been developed taking in account various aspects

The study was conducted with revised DPR, and it was observed that the work was being implemented according to DPR (Bill of Material/ quantity). The different equipments like Transformer, breaker & line materials are inspected & tested by competent authority as per ISI standard. Release of BPL connection is done as per sanction available. A supplementary DPR (prepared by PGCIL) for Dibrugarh district for sanction of extra 20% connection has been submitted; and it is at the final stage of approval. The DPR preparation should ensure total and optimised village electrification network, and probable load growth by estimating power for all including APL household. The VEI is designed with DT of 10, 16, 25 KVA capacities. Standard materials have been specified for REDB. Project execution is behind schedule, due to availability of working front, transport of material from distant manufacturers, delayed clearances and unavailability of local manpower for sub-contractors to execute task. Level of sub-contracting is high creating coordination problem. Sub-stations commissioning are delayed.

The DPR of the state has been made as per the guidelines of REC. However the assumptions made for preparing DPR is insufficient. Business Plan (Excel sheet F1—F4) has not been updated. The 12th plan DPR for incomplete work may be revised with the context of (a) experience of seven years of RGGVY implementation (b) BPL load can be increased (c) consumer base should comprise of APL, commercial, water works,

agriculture, small industries and DDG scheme. The state government department for rural development may provide assumption base for preparing 5 year business plan.

HVDS has been implemented through the RGGVY

Though location of DT is at the village periphery, the HT/LT ratio is satisfactory. With present level of connection transformer capacity and VEI design is sufficient. The DT used are of 10, 16, 25 KVA capacity. The efficacy of High Voltage Distribution System (HVDS) at present may not be required for the villages where population is low. State executive feel when more APL connections are released the Transformer capacity will be insufficient. A better clustering of population is desired and that is social issue. The location of DT in the village may be reviewed by the design wing of AEGCL and land allocation be facilitated by District Monitoring committee and Panchayat.

Study the actual implementation schedule till the last milestone

The project delays were analysed. Except for few Blocks in Lakhimpur the implementation time ranges from 30 to 50 Months. The state DISCOM is faced with natural, geographical, and political challenges in project implementation. Some of the reasons for delays are (a) forest clearances, clearance from the forest authority for drawing HT and LT lines, Delay is also due to land acquisition for the Substation, and right of way for installation of LT pole in the villages (b) Delay in materials receipt at site due to poor condition of road and bridge, and bad weather. There are damages during floods. (c) The BPLs list inconsistency; (d) Due to insurgency there are roads blocks, bandhs calls etc by the different organization for work stoppage (e) The project execution by PIAs and Sub-contractors depend on gang deployment drawn from the Local manpower (Skilled, and un-skilled). (f) For the success of RGGVY project, active participation of consumers is desired (g) Shortage of manpower of DISCOM at sites, for project monitoring, subsequent operation and maintenance after hand over, lines charging. The Gram Panchayats in some villages have not maintained record of date of electrification and they stay outside the village. Even in certain cases they could not provide the list of BPL.

Electricity supply per day in the village/ habitation electrified under RGGVY

The data of average Electricity supply is based on the feedback received from consumers in the villages. The average hours of electricity supply was 13.5 hours, ranging from 9 hours per day in Karbi Anglong, to nearly 17 hours in Dhubri district. Their main demand was that they want uninterrupted electricity during evening and scheduled supply of power.

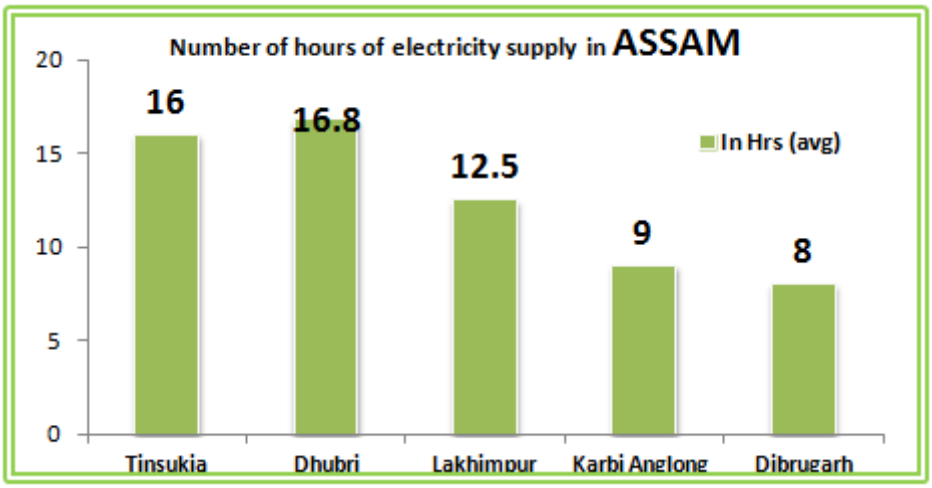


Figure 2: Hours of Power Supply (Response of Consumers) in Assam Districts

Number of APL connections released in the RGGVY village

In Assam, only 3.4% of recorded APLs (Surveyed villages) have access to electricity with RGGVY infrastructure. APL consumers in the surveyed villages want new connection, but the department could not release connections. It is also reported that APL consumers have paid for the connection, are not getting connection due to shortage of meters. One of the suggestion highlighted that APDCL can provide list of approved brand of meter, so that the consumer can purchase the meter and apply for connection with test-certificate. APL consumers also felt cost of connection was high. In order to fulfil the vision of providing electricity for all and to facilitate revenue sustainability of rural electrification the APL connection to remaining APL consumers may be provided at a discounted rate. This is being practiced in the state of West Bengal. Central government can give certain financial support for release of APL connection, and cost of connection may be shared between state and centre.

Issues of electricity bill to new connections including BPL connections; Examine instances of dis-connection of BPL connections released under RGGVY, if any, and reasons thereof;

About 47% households in the surveyed villages were receiving bills, a majority (39%) of them received them bi-monthly month, while 8% had their bills dispatched later. Consumers mentioned that they all paid the bills regularly. No BPL disconnections have occurred in the surveyed villages; due to no meter reading and billing; may be due incomplete consumer indexing.

To examine the efficacy of working of franchisee in distribution management

The performance of old franchisee working in the district is not satisfactory. Despite VEI, the consumer connections in the newly electrified villages are few. The department has to take initiative to get more APL consumers. To sustain operation and maintenance (O&M) activities in the handed over infrastructure, adequate skilled manpower and vigilance of the asset is desired from the department. These needs are to be facilitated by the matured Franchisee. No new franchisee has come forward or franchisees in district are not accepting new villages. People have started taking unauthorized connection. Effectiveness of the franchisees has to improve and new Franchisees have to come forward.

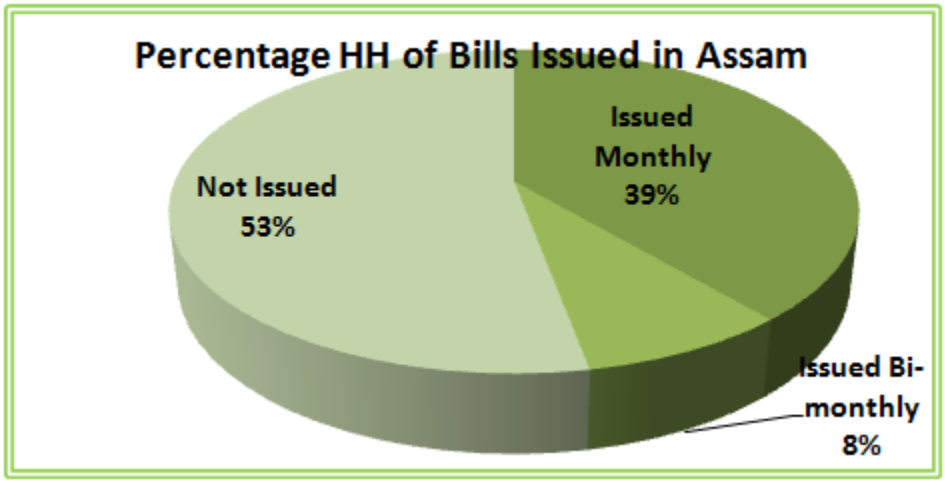


Figure 3: Billing status as observed during Survey (October 2011)

The power consumption in the villages is small hence revenue generation are small. There is shortage of power in some districts of upper Assam, and continuous power has to be ensured to tea gardens and paper mills. Franchisees find very limited income. A Public Private Partnership (PPP) model based on DDG can be modelled for RGGVY franchisee task, who can manage REDB, VEI, DDG, Revenue collection, vigilance, operation and maintenance etc for rural electrification. Assam state is rich in Biomass resources.

Socio-economic impact of village electrification under the scheme in respect of standard of living, education, health, employment opportunities etc

In is imperative that electrification has provided new generation of opportunities, better life style that is to be sustained by need based electricity supply. For enhancing socio-economic status of the villages, the public institutions (schools, health centres, panchayat office, and community centres) should take connection and get energized. The concerned authorities such as panchayati raj institution have to take action by integrating different development programmes with RGGVY to accrue commercial benefits and facilitate franchisee operation in the village.

Figure 4 is the compilation of perception of socioeconomic benefits felt by percentage of consumers in the surveyed villages in the district of Assam. The parameters selected were level of comfort, enhanced facilities in opportunities in education, employment opportunities, enhancement in feeling of security, drinking water availability and improved access to health services that included neighbouring villages. As 3 villages were not electrified in Dibrugarh districts, socio-economic data compile were not included in the study. Except for drinking water supply, health services and employment opportunities, there were positive response from the consumers.

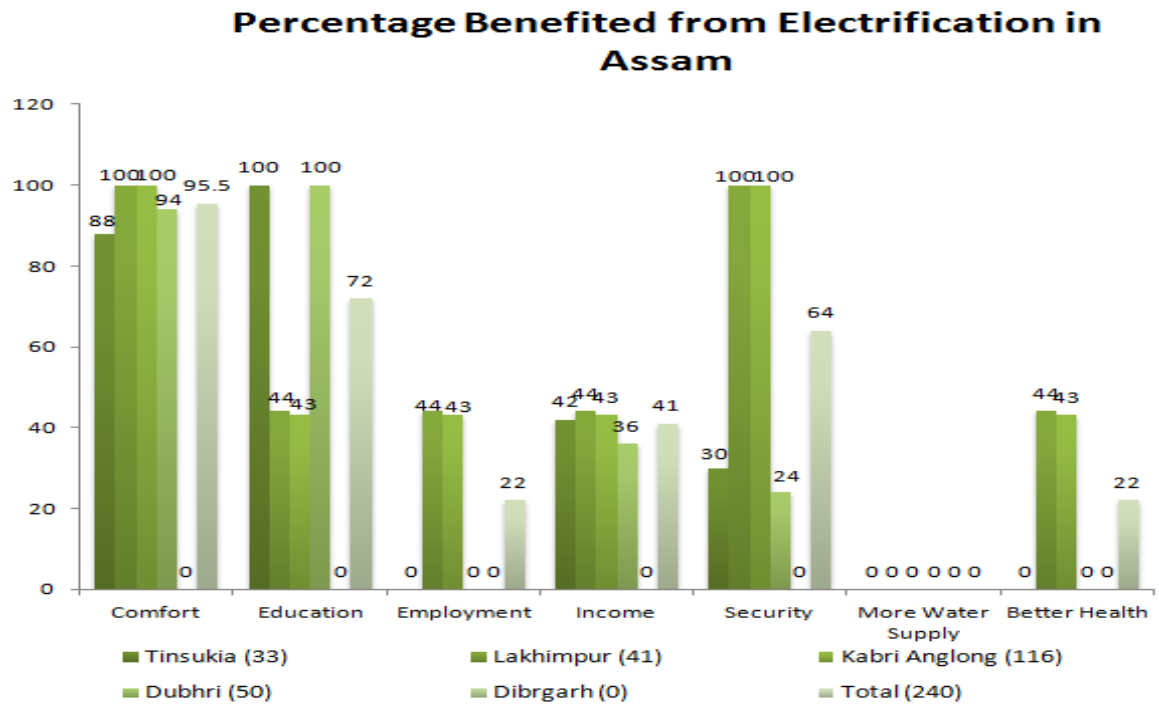


Figure 4: Socio-economic Benefits accrued from Rural Electrification in Percent in Districts of Assam (Response)

Provision of subsidy made by the state government for supply of electricity

Power tariff to rural area is subsidized. The tariff in the state for BPL is higher in comparison to other states. The Profit and Loss accounts of DISCOMs show significant loss. Assam Branch of Indian Tea Association complains about cross-subsidy. There is provision for surcharge on tariff to compensate cross-subsidy. The Multiyear tariff order does not indicate subsidy management strategy.

Extra power in the state to meet the need of newly electrified villages

The total power Availability from North East Region is 1119.5 MW, which is about 30% of available supply. In twelfth five year plan many projects are in pipeline that will provide additional 1150 MW power. Since power supply to rural consumers is a loss making proposition for DISCOM thus there is less and limited incentive for the DISCOM to serve rural consumer particularly in power deficit scenario. The central government may devise a mechanism by which it will allocate un-utilized power of NTPC at cheaper

rate to state government by emphasizing this will be provided to the rural areas where the incidences of load shedding in the rural areas are high. The Detail mechanism can be devised in proper consultation with the all the stakeholders including power exchange. ASEB should accelerate its renewable energy programme in rural areas that can be linked to the state Grid. This will provide employment in rural area, and benefit the utility by reducing AT & C losses.

DDG scheme in its present form

Assam state has not applied for projects under DDG scheme of RGGVY programme. It has good resources of renewable energy in form of biomass, mini and micro hydro power system. The state has under taken many RVE projects under RVE programme of MNRE.

Figures from the Ministry of New and Renewable Energy sources, estimate the total capacity of small hydro potential in Assam at 238.69 MW.[1] The Government of Assam framed a policy for the development of small hydro power. Its main aim is to encourage the power generation through small hydro sources and initiating private participation.

Suggest methods for better and effective implementation:

RGGVY programme has established good electricity network that is providing electricity to marginalized population free of cost, providing access facility to the APL families. DISCOMs have to continue to service network efficiently. In this context following points need attention;

a. Around additional 200 MW demand will be injected to the APDCL network after the completion of RGGVY (1st Phase). There are 32, 33/11 KV sub-stations; 500 KM of 33 KV lines; 24,300 KM of 11 KV lines and around 20,000 KM of LT lines will soon be completed. The challenge is of operation and maintenance, and generating additional revenue for sustenance. The system breakdown will have an unusual impact on APDCL revenue earning.
b. Shortage of skilled manpower and retaining them is a challenge. The present staff number earmarked is not sufficient to cater to the work demand. Responsible

[1] Ministry of New and Renewable Energy: Annual Report 2010-11; Chapter 5.31; http://mnre.gov.in/annualreport/2010_11_English/Chapter%205/chapter%205.htm ; Accessed December 2011

franchisees are the need of the programme implementation. Many former retired APDCL employees have got experience in these works, can be encouraged to be associated in the process with some honorariums or contractual amount so that burden of APDCL employee can be reduced.

c. Theft control modalities may be devised by creating strong vigilance force, developed from retired Assam Rifles, Army personnel. They can help during project implementation. Protection to storage and supply of material to the site can be provided by the vigilance team.
d. Transport of materials to the work sites is very difficult due to bad condition of the village roads and bridges. The PWD department doesn't allow movement of trucks. Animal (elephant) transport can be tried in these areas.
e. Generating additional income for consumers using electricity with commercial ventures needs to be modelled and encouraged.
f. Energy Accounting is essential for rural electrification development. Electronic smart meters having data transmission facilities be provided with distribution transformer (DT). These DT can be linked to systems coming under R-APDRP scheme. ASEB may study the need for additional IT system for the Assam rural electrification.
g. Transformer capacity should be calculated for total village population i.e. including APL population. Current augmentation of transmission network with ADB loan may be in- adequate for RGGVY network.
h.

The government of Assam has issued Rural Electrification Plan vide Memo No PEL. 89/ 2005/ pt.III/141-A dated April 13, 2009. The document may be revised for 12th plan in the context of 2011 census and experienced gained during implementation of RGGVY programme. The state is in process of accelerated economic growth. The issue of scalability of rural economics will be viewed in the context of economic opportunities, and welfare society. National rural electrification policy should be the basis of evolving State rural electrification policy and plan so that electricity could reach each and every house hold. There needs to be compliance between tariff order and rural electrification plan.

Consumer load growth in rural area will occur rapidly over time, hence overall T&D system needs to be strengthened and improved to cater to the demand. Since the state funds are limited and financial health of Discom is poor, the central government may provide loan to these states government at concessional rates for strengthening the system.

DPRs for further investments in the remaining areas or future augmentations need not be District based. Centralised Investments should be made, Distribution Circle wise and these should be made cost and profit centres to improve the accountability and efficiency of investments. Rural electrification plans are difficult to become financially sustainable unless these become part of the commercial operations of Distribution Circles combining with urban and rural distribution network.

Conclusion:

People are generally happy as soon as their villages are electrified. The normal life standard has also increased to some extent definitely. But in the long run when their demand of electricity will increase, it will be a difficult task for the APDCL to meet their demand and heavy load shedding will definitely jeopardize public interests. Implementation of RGGVY Programme in Assam has been constrained by a variety of reasons: both natural and manmade. Rapid strides in rural electrification are possible through mainstreaming and effective involvement of local population so that their own welfare is genuinely perceived to be embedded in the development oriented RGGVY/DDG Projects. Innovative business models are possible for this to be achieved, so as to provide wage employment and self-employment for the people of Assam. Capacity building for this purpose requires involvement of sector specific Non-profits, having multidisciplinary teams. Equally important is the need to be technically agnostic. The objective of rural electrification can be achieved more cost-effectively through decentralized generation from RE Systems. This calls for effective coordination between Ministry of Power (MOP), MNRE and State Governments. Private Sector can play a transformational role. Unfortunately RGGVY's rigidity excludes the private sector's involvement. MNRE's off grid scheme offers useful lessons for reconstructing RGGVY and DDG. The results of Phase II of the Jawaharlal Nehru National Solar Mission (JNNSM) also provide serious food for thought. An in-depth, rigorous study in the nature of cost-benefit/cost-effectiveness analysis of available technological options is called for urgently to ensure optimal resource allocation in the rural electrification sector.

Chapter 1: Background of the RGGVY Evaluation Study

Government of Assam has trifurcated Assam State Electricity Board (ASEB) into three companies: Assam Power Generation Corporation Limited (APGCL), Assam Electricity Grid Corporation Limited (AEGCL) and Assam Power Distribution Company Limited (APDCL). The APDCL is further divided into three DISCOMs, namely Upeer Assam electricity DCL (UAEDCL), Central Assam electricity DCL (CAEDCL), Lower Assam electricity DCL (LAEDCL). These are the Implementing Agencies (IA) for Rajiv Gandhi Grameen Vidyutikaran Yojana (RGGVY) programme.

The Assam Power Distribution Corporation LTD was formed in 23rd Oct, 2009 as a public limited company, in sole partnership with the Assam Government. The company was responsible for the distribution of power within Assam. All the events and liabilities of the Distribution Network, as well as the demand /sales/ supply were to be controlled by this organization. To facilitate the distribution, the company divided all of Assam into different electrical circles: Dibrugarh, Lakhimpur, Tinsukia, Nowgong, Sibsagar, Karbi-Anglong/ North Cachar, Jorhat, Silchar, Guwahati 1, Mangaldai, Guwahati 2, Tezpur, Bongaigaon, Kokrajahar, Dhubri.

As per the survey conducted by the CEA, the peak demand of power during 2013-2014 will be around 1428 MW, from the 1000 MW demanded at present. The estimated power requirement in 2015-2016 will be around 1715 MW.

The corporation has taken steps for implementing different plans & programmes as formulated by the GoA (Government of Assam), the Assam Infrastructure Development, RGGVY, APDRP (Accelerated Power Development and Reform Programme), R-APDRP (Restructured Accelerated Power Development & Reforms Programme), ACA (Additional Central Assistance), the NLCPR (Non Lapsable Central Pool of Resources) and TDF (Tribal Development Fund) etc. The Asian Development Bank (ADB) and the World Bank also contributed funds in the same Project.

As per the 2001 Census, the total number of villages in Assam was 25,124 and the number of villages electrified up to March, 2007 was 18,567. As per the new definition of village electrification, effective from February 2004, the number of un-electrified villages as on the 1st of April 2007 was 6,557, out of which 2,139 were remote villages i.e. these villages could not be electrified through conventional methods of drawing electrical lines.

Further, due to various natural calamities (flood, storm etc.) and other reasons (like theft etc.), 4051 villages got the de-electrified status.

The task of electrification of 2,139 remote villages has been taken up by the Rural Electrification Wing (REW) of ASEB under Chief General Manager (RE). Out of the total 2,139 villages, villages electrified up to June'08 were 157. The REW is working tirelessly to complete electrification of the remaining villages through non conventional means.

Assam electricity board is divided in 14 electrical distribution circles; not as district wise. APDCL has a separate RE wing with a Chief General Manager & Project Mangers as per different circles. The project manger is co-ordinating with the district authority as well as APDCL authority, state REC also monitoring the job at the Headquarters at Guwahati. They have appointed AGM (REM) for each district (in scope of 8% project scope) to coordinate the implementation of rural electrification project. He facilitates charging the line and commissioning of substations. He provides enabling facilities to the contracting firm, and is responsible to connect the existing infrastructure to the new infrastructure, and coordinates backward linkages constraints without adequate support staff.

The status of village electrification in Assam as on 31st March 2007, in presented in a tabular form below:

Table 1: Status of village electrification in Assam

Total No. of villages as per 2001 census	Numbers of electrified villages	Numbers of un electrified villages	Numbers of remote villages	Numbers of un electrified villages left to be electrified through conventional method	No. of De electrified villages	Total No. of villages left to be electrified through conventional method
25124	18657	6557	2139	4418	4051	8469

The district wise break-up of un-electrified, de-electrified & already electrified villages, proposed to be covered under 1st phase of RGGVY are tabled in table 2;

For the strengthening of REDB, 33 new 33/11KV sub-stations are proposed under the present scheme, distribution companies' consolidated details of which are provided at the beginning of each section/ circle. With the implementation of the 1st phase of RGGVY,

Table 2: District-wise status of village electrification in Assam

District	*Un –electrified*	*De- electrified*	*Already electrified*
Jorhat	60	183	471
Golaghat	366	117	509
Sivsagar	25	77	360
Dibrugarh	132	139	786
Tinsukia	251	99	725
Lakhimpur	370	174	502
Dhemaji	441	190	394
Nagaon	172	186	1003
Marigaon	85	172	215
Sonitpur	503	104	1014
Karbi Anglong	1254	126	436
NC Hills	113	131	149
Cachar	82	148	660
Hailakandi	22	49	250
Karimganj	135	75	550
Darrang	40	164	1082
Kamrup	29	350	927
Nalbari	5	140	598
Barpeta	60	166	791
Bangaigaon	13	338	501
Goalpara	33	290	361
Dhubri	133	260	782
Kokrajhar	94	337	414
ALL ASSAM TOTAL	**4418**	**4051**	**13380**

24300.82 kms of 11KV line, 2291.70 kms of 3-ph LT line, 17682.35 kms of 1-ph LT line, 1042 10KVA DTRs; 15371 16KVA DTRs and 4871 25 KVA DTRs will be added to the existing distribution network of ASEB. Furthermore, 989411 service connections will be released free of charge to BPL families of the state. District wise break of the proposed parameters is as given below.

Table 3: District wise RGGVY infrastructure created

District	*11KV line (Km)*	*3-ph LT line (Km.)*	*1-ph LT lline (Km.)*	*DTR 10KVA (Numbers)*	*DTR 16KVA (Numbers)*	*DTR 25KVA (Numbers)*	*BPL service Connections (Numbers)*
Jorhat	509.41	0.00	465.00	0	240	146	36041
Golaghat	1017.80	41.30	696.40	0	599	180	43026
Sivsagar	715.50	165.50	234.00	252	207	322	13505

Dibrugarh	131.50	163.50	298.80	589	409	546	24240
Tinsukia	892.55	0	723.20	0	359	366	44548
Lakhimpur	1085.85	72.60	776.10	0	607	356	34745
Dhemaji	1139.82	70.70	655.40	0	597	138	31322
Nagaon	1062.70	81	1179.70	0	988	295	100514
Marigaon	317.80	41.50	428.55	0	498	81	35417
Sonitpur	1974.50	45.00	873.00	0	1597	112	65817
Karbi Anglong	4689.80	801.10	2616.40	0	820	186	31504
NC Hills	1032.90	139.00	446.40	0	170	216	4681
Cachar	798.00	30.40	427.80	0	861	76	73512
Hailakandi	378.50	13.40	88.50	201	94	67	9788
Karimganj	740.50	128.00	192.00	0	169	584	27488
Darrang	1297.40	98.35	955.10	0	1135	256	53092
Kamrup	1152.70	153.15	1608.50	0	1163	316	75070
Nalbari	374.20	1.10	417.15	0	591	7	45672
Barpeta	558.89	38.80	602.20	0	902	97	60595
Bangaigaon	876.90	71.70	1301.60	0	737	167	41969
Goalpara	537.90	32.90	442.85		606	74	31692
Dhubri	974.70	97.30	1348.60	0	1173	252	74274
Kokrajhar	857.00	12.40	604.80	0	849	31	40899
ALL ASSAM TOTAL	**24300.82**	**2291.70**	**17682.35**	**1042**	**15371**	**4871**	**989411**

It may be noted that the newly created 4 districts of Chirang, Baksa, Udalguri and Kamrup (Rural) are not separately mentioned in the above lists. The proposed parameters against these districts are included along with the Bongaigaon (Chirang), Nalbari (Baska), Darrang (Udalguri) and Kamrup (Kamrup (Rural)) districts.

Chapter 2:

Rural and Remote Village Electrification Programme

The implementation of the Remote Village Programme was initiated by former ASEB in the State of Assam

- The villages of Assam to be electrified fall under two categories: accessibility from existing electricity network and non-accessibility from existing electricity network. The accessible un-electrified villages are being electrified under the RGGVY programme of the Central Government.
- The ASEB has identified 2139 villages, as on 31.3.2006, which is not accessible from the existing conventional grid due to various topographical constraints and other considerations, like natural calamities, recurring floods in plains of Brahmaputra Basin & Barak Valley; that deprive many villages from the access of electrical energy; in addition no payment structure is possible in the river char[2] area. Setting up of any power plant (renewable) and cost effectiveness are also factors to be considered.
- Out of 2139 remote villages, 1084 are located in the plains of Assam and the remaining 1055 are located in the hilly areas of the two hill districts of Assam: Karbi Anglong and North Cachar district. These villages are termed as Un-electrified Census Remote Villages. As per the preliminary survey by the State Government in the year 2011, there are 123918 households inhabited in the 2139 of remote villages.
- Field survey is being conducted to identify the left out remote villages of the state. ASEB has already sent a list of 182 of such villages to the MNRE (Ministry of New and Renewable Energy) through the Power Department. The Government of Assam and the MNRE have declared 63 villages out of 182 as remote.
- For 100% remote village electrification by 2009 and all the households by 2012, as specified by the Government of India policy; the Power Department under the Government of Assam has been assigned as the nodal department. The three government agencies, namely ASEB, AEDA and the Forest Department, of Government of Assam, have been appointed as the implementing and facilitating

[2] Post flood dried river bed areas

agencies for implementation of the remote village electrification works through new and renewable energy resources in the state of Assam.

- The sharing of the remote villages for electrification through non-conventional energy sources amongst the three implementing agencies are as follows:
  - ASEB = 1057 numbers
  - AEDA = 920 numbers
  - Forest Department = 162 numbers

Table 4. District-wise List of Remote Village

Sl. No.	*Name of district*	*No. of Remote Villages*
1	Barpeta	35
2	Darrang	29
3	Goalpara	77
4	Kokrajhar	40
5	Kamrup	36
6	Bangaigaon	29
7	Dhubri	86
9	Nagaon	3
10	Marigaon	14
11	Karbi Anglong	818
12	Sonitpur	45
13	NC Hills	237
14	Karimganj	45
15	Cachar	41
16	Hailakandi	14
17	Timnsukia	32
18	Lakhimpur	92
19	Sibsagar	3
20	Dibrugarh	6
21	Golaghat	74
22	Dhemaji	311
23	Jorhat	72
TOTAL		**2139**

The major agencies for various tasks executed in RGGVY programme are APDCL, Ministry of Power (Govt. of Assam), REC (Guwahati site office), DISCOM, Panchayat and PIA / contracting firm. APDCL has got a separate rural electrification wing, headed by a chief general manager with a full-fledged HQ office at Guwahati.

The office the General Manager (GM), is looking after the contract allotment including tendering and evaluation / monitoring, and also routine progress in all the project with future programme. Under him there are 2-3 Deputy General Manager (DGM) rank officers, who are assisted by 10 assistant general manager (AGM) rank officers. They are looking after the progress of work, release of fund & technical clarification /modification etc. The design wing under AEGCL is scrutinizing the evaluation of DPR & other technical & commercial matters. The different equipments like Transformer, breaker & line materials are inspected & tested as per ISI standard.

One AGM rank, executive engineers is posted as project manager REC to look after the construction and installation of RE works in one or two specific districts. He generally coordinates the REC works with the existing DISCOM. He has been authorized by the Government of Assam for charging up the line. The RE wing also properly coordinates efficiently with REC head quarter and rural local body.

Rural Electrification in the state of Assam has been a big challenge for the line management and the contractor executing the task. This has been due to the terrain, dense forest, frequent flood with change in river course, and farmer exploiting the char areas river for agriculture. There are social disturbances in various pockets of Assam leading to stoppage of work. In addition to that there are shortage manpower in line management and skilled workers.

Assam may be lagging behind with respect to other states, in the area of use of renewable energy sources. It has sufficient natural resources to develop this sector. If past records are seen in the present context of power generation and energy available in the state, the energy need in rural area should be given careful thinking. The greater importance to renewable energy is needed, appropriate technology have to be identified; an execution strategy have to be planned; so that people get full benefit of electricity and enhance day to day livelihood. In these areas renewable energy technology for providing power in stand-alone mode is the current solution, and later that can be extended to grid.

Full efforts are being exerted by ASEB and the nodal agency of MNRE to harness the renewable energy sources and to provide electricity to the rural masses of remote villages. There are various promotional incentives launches by the Government of India and thereby definitely is providing electricity for the rural masses.

During the survey the district heads of the DISCOMs (chief engineer and superintending engineer) were enquired about their perceptions of RGGVY, and they highlighted following:

(a) Development of Village Electricity Infrastructure (VEI) in the un-electrified villages,

(b) Upgrade of the partially electrified village electricity infrastructure,

(c) Successful renovation of the damaged infrastructure,

(d) Intensive electrification in villages where some gaps were identified to strengthen the infrastructure and

(e) Release of BPL connections.

State REC provided the revised DPR and contact addresses, and with this background the field survey was conducted to collect information highlighted in the terms of references of REC. It was a feeling that strengthening of existing network for linking RGGVY network to state power grid; was not getting adequate importance. Commissioning of 33/11 KV substation was getting delayed. There are various shortcoming in execution of RGGVY projects, and one of the major concern is of skilled manpower that can be permitted to work charged grid. Many of the former APDCL employees, who have settled and have stakes in development of the area, who have got experience in these works can be encouraged to involve in the process with some honorarium or contractual amount so that burden of APDCL employee can be reduced. The subcontractors are also lacking in skilled manpower.

Chapter 3:

Implementation Methodology of RGGVY Programme in Assam:

DISCOMs in Assam have followed the standard REC procedure of implementation. The sequential procedure is as follows:

- Preparation of district based detailed project reports for execution on turnkey basis.
- Involvement of central public sector undertakings (CPSUs) of power ministry in implementation of some projects.
- Call for tenders for the rural electrification in the district on a turn-key basis from competent contractor.
- Provide enabling services to turn-key contractor to implement project according to schedule
- Adhere to the protocol of handing over of asset by contractor and taking over of Asset by DISCOM
- Certification of electrified villages by the concerned Gram Panchayat.
- Deployment of franchisees for better management of rural distribution, for better consumer services and reduction in losses.
- Undertaking by states for supply of electricity with minimum daily supply of 6- 8 hours of electricity in the RGGVY network.
- Making provision of requisite revenue subsidy by the state.
- Determination of Bulk Supply Tariff (BST) for franchisee in a manner that ensures commercial viability.
- Three tier quality monitoring mechanism for XI Plan Schemes have been made mandatory.
- Web based monitoring of progress.
- Release of funds linked to achievement of pre-determined milestones.
- Electronic transfer of funds right up to the contractor level.
- Notification of Rural Electrification Plans by the state governments.

The objective of evaluation study was to affirm the tasks performed by DISCOMs and RGGVY implementing agency in the context of Terms of Reference (TOR) issued by

REC and perception of DISCOMs in the following district-block-villages as indicated in Table 5.

Considering the size of project activities and also the organizational infrastructure available with the state utilities; the Central Government decided to provide the service of Central Public Sector Undertaking in order to complete the project in a compressed time schedule of five years. In case of Assam, PGCIL is helping APDCL by shouldering the responsibility of implementing RGGVY in seven districts namely: Dibrugarh, Sibsagar, Sonitpur, Cachar, Hailakandi, Karimganj and Kokrajhar District. Rest of the districts are also being done on turnkey basis. The turnkey contractors for rest of the projects are being selected by open tender. In the assigned project, the district of Dibrugarh is being done by PGCIL, and the contractors assigned the jobs are listed in Table 5A for the districts of Karbi Anglong, Dhubri, and Lakimpur.

Table 5: Sample villages surveyed in the state of Assam listed under given blocks and districts[3]

Name of the District		***Name of the Block***	***Name of the Village (Census Code)***	
1	KARBI ANGLONG	Bokajan	1	Christan Gaon (02296400)
		Howraghat	2	Dighliati Gaon (02200900)
		Lumbajang	3	Pattar Gaon (02124300)
		Nilip	4	Lekthe Gaon (02321500)
		Somelangso	5	Maghar Bosti (02247700)
2	DHUBRI	Bilasipara	1	Shaktola (00178200)
		Birshingjarua	2	Fulkatari (00160400)
		Chapar-Salkocha	3	Segunjhari (00196200)
		Fekamari	4	Kaliralga Pt.I (00222500)
		Rupsi Pt.	5	Rupshi Pt.II (00113600)
3	DIBRUGARH	Barbarua	1	Deori Gaon (01641600)
		Khowang	2	Kashi Pather (01706200)
		Lahowal	3	Gohain Gaon (01649500)
		Tengakhat	4	Fekelajan (01687800)
		Tingkhong	5	Kuli No.1 (01721300)
4	LAKHIMPUR	Boginodi	1	Goriamari (01325900)

[3] Villages specified by the Rural Electrification Corporation in the contract

		Dhakuakhana	2	Lahibari (01357700)
		Ghilamora	3	Barkalia N.C. (01373200)
		Karunabari	4	Nizlaluk (01287300)
		Narayanpur	5	Majgaon (01277200)
5	TINSUKIA	Hapjan	1	Lesenka Gaon (01552200)
		Kakapathar	2	Boka Pathar (01598800)
		Margherita	3	Lama Gaon (01613500)
		Sadiya	4	Ghahpur (01511700)
		Saikhowa	5	Chengeli Gaon (01537400)
Districts: 5		**Blocks: 25**	**Villages: 25**	

The village electrification programme is sustained and energized by the substation shown in Table 5A. These are the units for strengthening REDB and the backward linkages to village electrification. The contractor engaged for the job is indicated.

Table 5A

Sl No	District	Coverage	Contractor
1	Tinsukia	2x2.5 MVA S/S at Chapakhowa alongwith associated 33KV line(30.0 km.) & 11KV line(8.4 km) in Sadia Circle	Pkg. TSK-1; (JV) of M/s North Eastern Cables & Conductors (P) Ltd., Jorhat, Assam.
2	Karbi Anglong	1x2.5 MVA S/S at Umpanai alongwith associated 33 kv & 11 kv lines.	M/s North Eastern Cables & Conductors (P) Ltd.,A.T.Road , Jorhat-1
3	Karbi Anglong	1x2.5 MVA S/S at Bokolia alongwith associated 33 kv & 11 kv lines.	M/s North Eastern Cables & Conductors (P) Ltd.,A.T.Road , Jorhat-1
4	Lakhimpur	1x2.5 MVA S/S at "Raidengia" alongwith associated 33 KV & 11 KV Lines.	LKP-1: M/s Jayanta Khaund,K.B.Road, North Lakhimpur
5	Lakhimpur		LKP-2: M/s North Eastern Cables (P) Ltd., A.T.Road,Jorhat-1
6	Lakhimpur		LKP-3: M/s Jayanta Khaund,K.B.Road, North Lakhimpur
7	Lakhimpur		LKP-4: M/s Chadalavada Infratech Ltd., Hyderabad.

8	Lakhimpur		LKP-5: M/s Win Power Marketing (P) Ltd., Jorhat.

Table 6: Brief on RGGVY Implementation in Assam (10th and 11th Plan)[4]

State/UT Name (Total No. of Districts)	No. of DPRs	5 Year Plan	Project cost Sanctioned (in Rs. Cr.)	Awarded cost/Revised cost (in Rs. Cr.)	Total Amount Released (in Rs. Cr.)	Electrification of Un-/De-Electrified villages		Intensive Electrification of Electrified villages		No. of Connections to BPL Households	
						Coverage in No.	Achievement in No.(%)	Coverage in No.	Achievement in No.(%)	Coverage in No.	Achievement in No.(%)
ASSAM	3	10th Plan	158.04	199.1	175.32 (88.1%)	903	903(100.0%)	1746	1746(100.0%)	148971	123456(82.9%)
	20	11th Plan	1544.33	2154.97	1839.66 (85.4%)	7622	6109(80.1%)	11584	8752(75.6%)	842685	581420(69.0%)
		Others		0	1.8		0		0		0
TOTAL of ASSAM	23		1702.37	2354.07	2016.78 (85.7%)	8525	7012(82.3%)	13330	10498(78.8%)	991656	704876(71.1%)

In Assam, there are Detailed Project Reports (DPRs) for 23 Districts, elucidating the planning, fund made available for the project and scope of work behind the electrification of each district. As shown in table 6, the DPR cost estimate was rupees 1702.37 crore, and the project cost was sanctioned, out of which the total amount released was 2016.78 crore Rupees. According to the reports, 82% of the un/de-Electrified villages had been electrified- accounting for 7012 households. Within the electrified villages, there were a planned 13330 households that had to be electrified, out of which nearly 79% were successfully achieved. Among the BPL households, there were over 9 lakh households to be connected, out of which 71% of the target had been accomplished.

Table 7: Preliminary RGGVY relevant Information of Districts to be surveyed

District	DPR Sanction date	Sanctioned Cost in lakhs	Name of Implementing Agency
Dibrugarh, 11th Plan	05-03-2008	6814.54	PGCIL
Tinsukia, 10th Plan	23-11-2005	5566.91	ASSAM SEB, APDCL
Lakhimpur, 11th Plan	05-03-2008	6797.56	ASSAM SEB, APDCL
Karbi Anglong, 11th Plan	25-03-2008		ASSAM,SEB, APDCL
Dhubri, 11th Plan	05-03-2008	9233.93	ASSAM,SEB, APDCL

[4] Information collected from the REC, New Delhi Office

Table 7A: Project wise achievement of electrification of villages & Households under 10th and 11 th plan in Assam[5]

Project wise achievement of electrification of villages & Households under 10th and 11 th plan in Assam											
		Achievement (ach) 2011-12			Cumulative achievement till 30-11-2011				Energization of UE & DE villages	% ach of UE Villages wrt Rev Cov	% ach of BPL HH wrt BPL HH
sl no	District in the state	UE/DE Villages	EV	BPL HH	UE/DE Villages	EV	RHH including BPL	BPL HH			
1	Tinsukia				350	725	51548	51548	350	100	100
2	Dhubri	75	229	15825	333	497	38160	38160	273	85	51
3	Dibrugarh	39	167	559	158	312	11157	11157	115	64	91
4	Karbi Anglong	189	29	8058	1226	406	21113	21113	985	89	67
5	Lakhimpur	113	82	12930	519	487	30905	30905	512	95	89

Table 7 and 7A indicates that project awarded in the 10th Five Year Plan has been completed, while the projects awarded in the 11th Five Year Plan are yet to be completed. Some of the surveyed villages in the district of Dibrugarh are unelectrified. The status of implementation of RGGVY in the surveyed villages is detailed in chapter 5. The table 7A indicates the implementation status for each district showing percentage achievement of UE Villages with respect to revised DPR coverage and percentage achievement of BPL HH with respect to total BPL HH.

The schedule of Implementation has been discussed with the SE in the district, for which the DPR is made. The time schedule of substation erection is detailed in Annexure 2. There is slippage in commissioning of the substation. It can be observed that main delay occurs in erection and commission of substation at site due to material transport to the site. Main delay occurs in village electrification infrastructure (VEI), and laying of 11 KV lines. This may be due to lot of public dealing during process of implementation that needs to be streamlined both for turnkey contractors and CPSU-PIA. VEI work is executed by deployment of gangs of few workers in the district. The deployment is constrained due to availability of local manpower interested to take up the task. The

[5] Information collected from CPM, REC, Guwahati

sanction of BPL households is received in batches. These delays are over and above the stoppage of work due to floods, insurgency, storms etc.

The status of VEI of the five districts covered and surveyed to evaluate implementation progress made in RGGVY programme is described in table 8. This was the context of Village survey.

Table 8: District-wise Village Electrification Infrastructure of the Five Districts

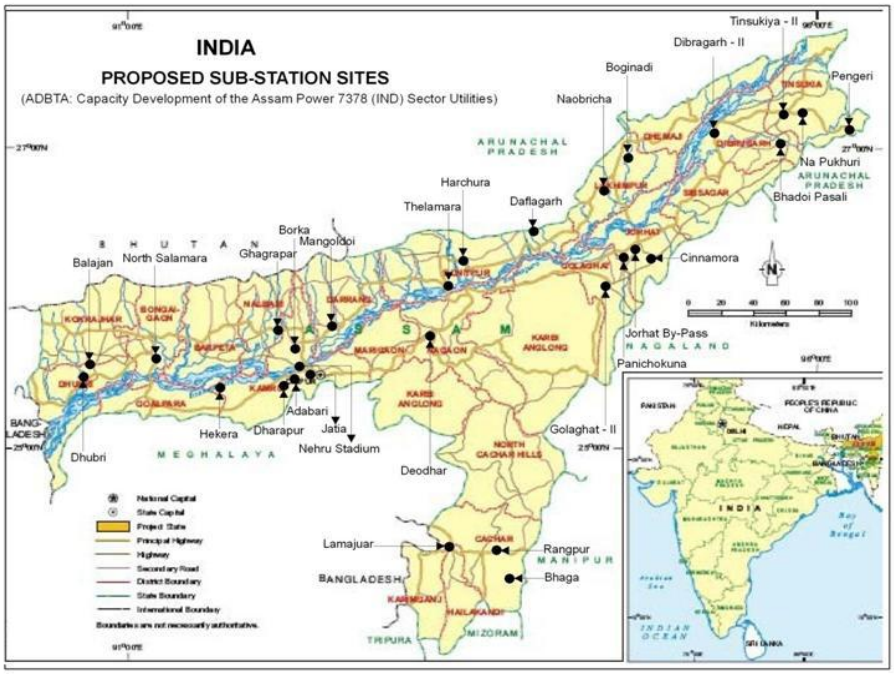
Sl No.	District	Propose BPL Connection	Proposed DTR in KVA			Proposed 11KV Line (In Kms.)	**Proposed** LT Line (In Kms.)	
			10 KVA	16 KVA	25 KVA		3 Ph	1 Ph
1	Dibrugarh	24,240	589	409	546	1315.5	164	299
2	Lakhimpur	34,745	Nil	607	356	1085.85	73	776
3	Karbi Anglong	31,504	Nil	820	1186	4689.8	801	2916
4	Dhubri	74,274	Nil	1173	252	794.7	97	1349
5	Tinsukia	44,584	Nil	359	366	892.55	0	723
	All District (Total), Assam	9,89,411	1042	15371	4871	24301	2292	17682

A major percentage of DISCOM executives appeared to be positive and committed about the RGGVY scheme and were hopeful of the success of Rural Electrification system, provided adequate power supply is allocated to rural area. They have under taken a RGGVY awareness programme. Power generation during off-peak hours are comfortable. Please refer to annexure 4. Challenge is to meet peak load demand.

As stated, ADB funding is also being used to strengthen the power distribution network. The proposed network development by erection of sub-station by Assam state electricity board is indicated in Figure 1. The schemes approved under ADB are listed in Annexure 8. Currently it appears the scheme will benefit the Urban Areas. The rural areas may benefit from the additional capacities of the installations.

Figure 1: Proposed Substation site under ADB funding[6]

[6] ADB funding report



Power Supply Position In Assam

Details of Million Unit (MU) availability and short falls during the last 10 years are outlined in the Table given below.

Table: 9- Demand and Supply of Power in the State of Assam[7]

Year	*Demand (mu)*	*Availability (mu)*	*Short Fall (mu)*	*Short Fall (mu) in percent*
2002-2003	3550	3192	358	10
2003-2004	3717	3291	426	11
2004-2005	3788	3376	412	11
2005-2006	4218	3537	681	16
2006-2007	4442	3754	688	15
2007-2008	4858	4030	828	17
2008-2009	5166	4271	895	17
2009-2010	5466	4661	805	15
2010-2011	5967	5034	932	16

Referring to table 9, it is observed that the demand of power supply has increased from 3550.00 (MU) in 2002-2003 to 5966.5 (MU) in 2010-11. Similarly the availability has also risen from 3192.287 (MU) to 5034.113 (MU). Up till March 2011, the short fall also

[7] DISCOM holding company

increased from 357.713 to 932.380 (MU) that is deficit has increased from approximately 10% to approximately 17%. There is a likelihood that demand will further increase in the future and ultimately, shortfall may be more than 1000 MU within coming years.

Development of Power generation capacity needs to be addressed urgently, despite normally stated that north-east is surplus in power. The power demand shortfall is significant, and the state is importing power and that is increasing rapidly. The information provided in Annexure 4 shows that power import through open access is significantly high during peak hours. ASEB should carry out a plausible projection of power demand and go into power purchase agreement on a long term planning. As a long term measure ASEB should stress on power generation through renewable energy, small hydro projects, and thermal power plant using both coal and gas. Renewable energy will facilitate in various form by supporting peak load and reducing T &D Losses.

The government of Assam has issued Rural Electrification Plan vide Memo No PEL. 89/ 2005/ pt.III/141-A dated April 13, 2009.

The document has following Sections

1. Status of Rural Electrification (works executed GOI programme of MNP (MNRE], PMGY, TSP, and SCCP ETC)
2. Load Forecast for Rural Areas, where grid connection feasible
3. Rural Electrification Delivery mechanism
4. Generation Plan
5. Transmission Plan
6. Rural Electricity Distribution backbone
7. System and Revenue Sustainability
8. Implementation Mechanism

The document was prepared with the experiences of the 10th Five Year Plan, hence each strategy and plan had a context. However this document may be revised in the context of the 12th Five Year Plan Census 2011, and the experience of RGGVY project, specific to load forecast, revenue sustainability, socio-economic development and delivery mechanism. The issue of scalability of rural economics will be viewed in the context of economic opportunities, and welfare society. State has issued the Economic Development plan. This can provide inputs for Rural Electrification Plan.

The expectation of the rural consumers to get the benefit of electricity throughout the day is very much uncertain. The villages primarily need the power from 6 pm to 10 PM. The focus should be on peak load management, where the state can take advantage of hydel power projects.

Actual implementation schedule vis-à-vis planned implementation schedules have being taken care of by the respective DISCOM, however there have been delays. Incidentally there was no common factor other than floods as a cause of delay. The causes of delays have been highlighted in next chapter, where the survey observations have been described. The parameters for delays in substations have been highlighted for three districts and the implementation in Tinsukia. It is evident that in Assam the implementation schedule in totality is more than 24 months, and the approved REC schedule is of 18 months for the eleventh plan with additional month for North-East states.

Assam has diversified geography and varied socio-political challenges. The delays in each district has unique feature. Hence same has been discussed in chapter separately.

Chapter 4:

Approach and Methodology used in village survey:

The field survey was conducted with reference to questionnaires submitted with the inception report. Initial reference of state contact and facilitating agency were obtained from the REC headquarters. Initial interactions with state level REC-CPM and DISCOMs were established.

For conducting field surveys, contacts were established with former DISCOM employees. With their assistance local IRADe team was established. Following activities were executed with their participation.

- DPR was collected from the office of CPM, REC to understand project base-line
- Stake holders identified and their role was enquired based on the questionnaire
- Field survey was undertaken to interact with consumers, panchayati raj Institutions, district committee members. Design of questionnaires for village were reviewed I context of district survey and stakeholders.
- Evaluation of APL/BPL households.
- Evaluation of RGGVY implementation (REDB & VEI) and quality of work done.
- Evaluation of socio-economic status due to village electrification.
- Evaluation of franchise system.
- Understand socio-economic impact of village electrification.

Assam State Energy Ministry has issued Rural Electrification Plan in the year 2009. But survey team could not get the copy. In view of enhanced capacity of State DISCOM executives, it is proposed that State Rural Electrification Plan can be redrafted.

Trace process of selecting Implementing agencies: The REC through their empowerment by MoP assignment request the state energy and power ministry/ department to enable development of rural electricity infrastructure. The department delegates the planning task of facilitating development of RE for each district to the Current DISCOMs. DISCOMS evaluate their capacity, resources plan RGGVY project implementation through (a) internal resources or (b) Central Public Sector units such as NTPC, PGCIL, NHPC, and DVC.

- Status of REDB and VEI in the concerned districts/blocks.
- Status of electrification in villages surveyed.
- Status of village electrification in associated districts/blocks.
- Status of BPL connections in villages surveyed.
- Status of APL connections in villages surveyed.

Chapter 5:

Observations of Village Survey:

The field survey was conducted as per terms of reference issued by the REC, who earmarked the villages that are listed in Table 5. Five districts (Tinsukia, Dibrugarh, Lakhimpur, Karbi Anglong, Dhubri) had been selected, in which 5 villages were chosen from five blocks of each district. For the survey to assess the impact and reach of RGGVY programme, questionnaire based interview was conducted. In the sample of 25 Assam villages surveyed, 32% of the total number of rural households has been connected under RGGVY. There were 1513 BPL households within the sample, of which 675 (45%) have been electrified. Among APL households, only 3% of the recorded 642 APL households (22 households) had access to electricity with RGGVY infrastructure. The RGGVY project for Tinsukia district was undertaken in the tenth five-year plan; The rural electrification of districts Dibrugarh, Lakhimpur, Karbi Anglong, Dhubri were undertaken in 11th five year plan. The project implementation of Dibrugarh is being executed by CPSU, PGCIL and for other project ASEB is responsible for implementation. The summary of village survey is shown in Figure 2.

Figure: 2 Consumer Profile in the Districts Surveyed

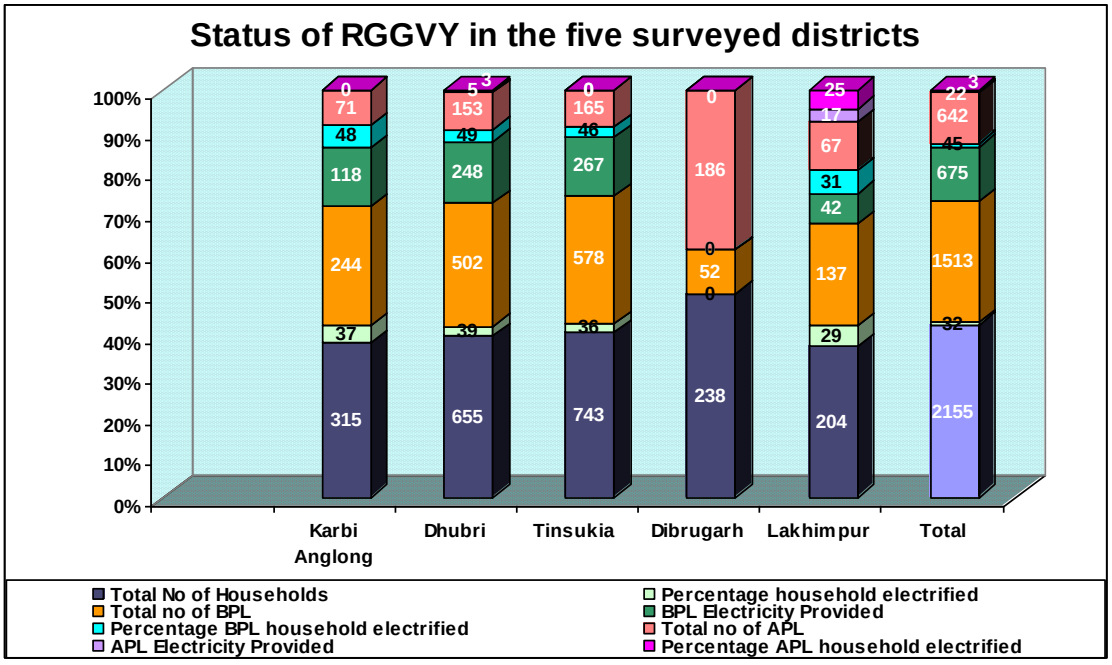


Figure 2A shows the status of electrification in the surveyed districts of Assam. It is found that out of the total households to be electrified, in total 68% of the households have yet to be connected. In this case, Dibrugarh fares the worst with not even a single household considered electrified. Dhubri district, with 49% BPL households electrified, and 3% of the APL household electrified seems to be the most likely to achieve complete rural electrification. Interestingly, Lakhimpur district, though having nearly 70% household still un-electrified, has electrified around 25% of its APL households

Figure 2A: Status of households connected within Assam

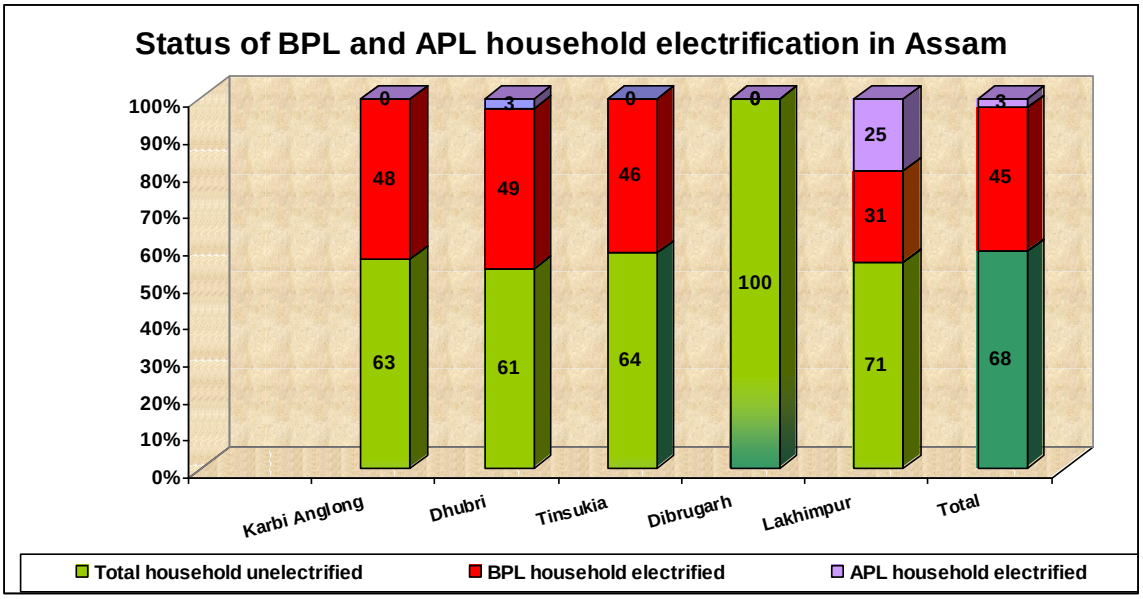
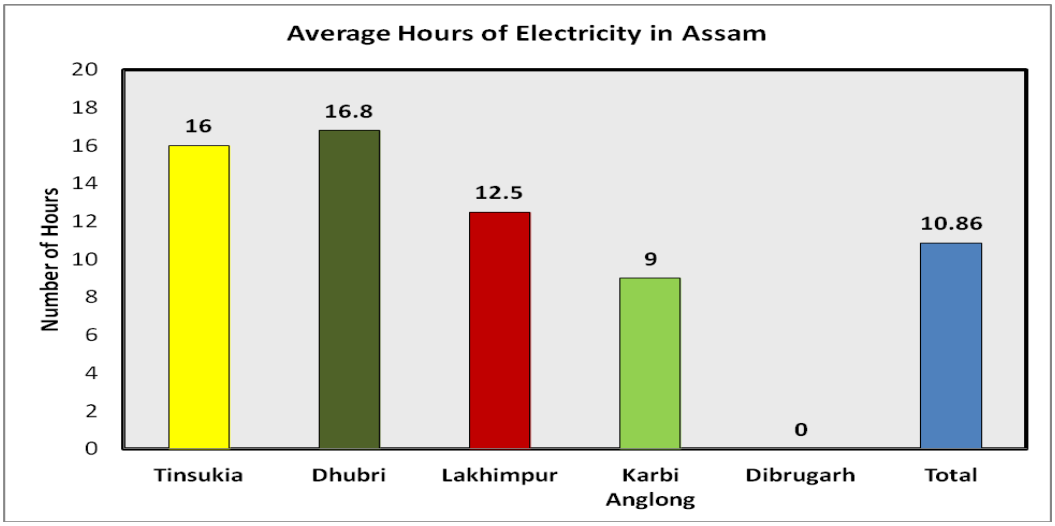


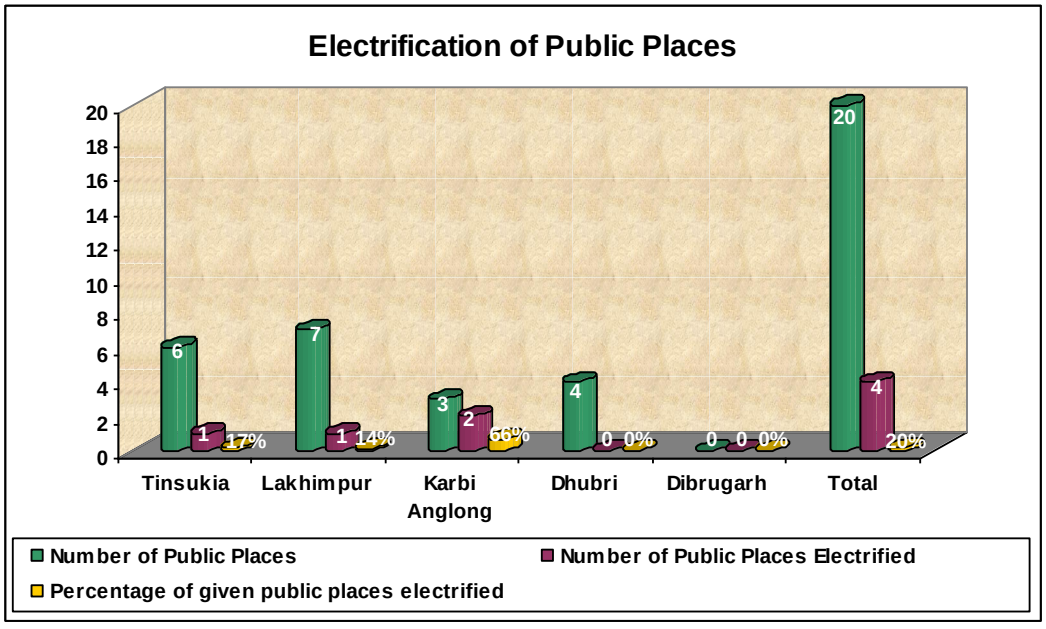
Figure 3: Status of Electricity supply in villages.



As can be seen from the Figure 3, the number of average hours of electricity supplied in the surveyed districts of Assam (excluding the district Dibrugarh) ranged anywhere from 9 hours per day to 17 hours per day. In the five villages of the district of Dhubri, the average hours of electricity received stood at 16.8 hours a day. On the other end, the lowest recorder number of average hours was in the district of Karbi Anglong. At the time of the survey, the district Dibrugarh was termed de-electrified and the given villages were yet to be electrified as per the RGGVY guidelines. Excluding Dibrugarh, the average hours of electricity availability is 13.575 hours (otherwise 10.86 hours).

The reach of the RGGVY facilities to public places, is indicated within Figure 4. Of the given five districts, we assessed the data for public places that had access to electricity. It was found that in totality only 20% of the 20 public places looked at i.e. only 4 public places had undergone electrification, or were receiving electricity. Out of these, there was provision only enough for basic appliances like fans and lighting to operate.

Figure-4: Status of electrification of public places in Assam



The reach of the RGGVY to public places is determined within this figure 4. Of the given five districts, we assessed the data for public places that had access to electricity. It is found that in totality only 20% of the 20 public places looked at i.e. only 4 public places

have been electrified and energized. There is provision only enough for basic appliances like fans and lighting to operate. . The concerned authorities such as panchayati raj institution have to take action by integrating different development programmes with RGGVY to accrue commercial benefits and facilitate franchisee operation in the village.

Karbi Anglong is the district with the highest percentage of electrification of its public buildings. Only one out 6 and 7 public places examined in Tinsukia and Lakhimpur respectively, are receiving electricity.

According to population density and load demand at village level, the use of HVDS distribution system is very unlikely. Population in these villages are low. There is no indication that load demand may grow in these hamlets as the earnings of people are comparatively low. The habitations were remote and dispersed. Here only traditional infrastructure development is adequate. Placement of transformer may be an issue. BPL connectivity is being provided according to RGGVY guidelines. Few APLs are applying for new connection. Use of irrigation pump-sets working in the village and other heavy duty electrical machines was not observed in the villages. To facilitate development of small scale industry, a more 3 phase supply should be provided.

Observation on Interaction with the Contracting firm PGCIL in Dibrugarh:

1) The DPR for the district is prepared by the ASEB.
2) The implementation agency is the Power Grid Corporation India Ltd.
3) During the survey by the contracting firm of M/S PGCIL; various anomalies were found. Few villages could not be located, some villages were already electrified, and some of the villages could not be approached due to bad vehicular traffic and hazardous transportation. Amendments to DPR had to be made twice.
4) Total villages included in RGGVY for the district are 931.
5) For about 25 villages, there are problems due to right of way; for the Tea Estate Authority, oil authority and recalcitrant villagers. This problem is to be solved by PGCIL. Six villages that were ready for charging, and to be handed over to the PGCIL/ASEB by the contracting firm, could not be completed in all aspects.

6) Insufficient parameters (material quantity) as per BOQ are causing a lot of problems in execution. Villages are obstructing the work of the contracting firms, demanding complete electrification of their respective villages.
7) In most of the villages, the capacity of DTR is not in accordance with the population. Once all the APL consumers are connected with electricity, the connected DTR will be overloaded and will be damaged before the defect liability period. Already some transformers are reported to have failed.
8) The contracting firms have completed about 450 villages and handed over another 50 villages. But during May 2011, PGCIL has amended that there were additions made thrice during the executing period, with the addition of further parameters in those completed villages making the situation even more difficult.
9) In lots of villages, villagers have forcibly captured poles and other materials. These villages are not (fully or partly) included in the list and did not allow shifting of materials to the nearby villages.
10) At the very beginning of the project, PGCIL forced the contracting firm to install BPL power service connections in the premises of the beneficiaries without developing infrastructure to achieve a target fixed by the REC for BPL connection. In the infrastructure of around 450 villages, it has been observed that only 15-18% power service connections to BPL consumers can be provided with installed infrastructure whereas BPL kit has been installed two years back; which has created an unnecessary inconvenience to the consumers as well as with the PGCIL contracting firms.
11) Village wise amended BOQ parameters are not coming to most of the villages. There are few villages where 11KV parameters with DTR, is defined, where there is no option of LT parameters.
12) Due to shortage of manpower PGCIL and contracting firm work progress is hampered.
13) PGCIL's initiative to take up certain issues in LOA with their HQ is also hampering the progress.

14) Frequent bandh call by different organizations and insurgents are the reason of shortage of manpower within the contracting firm, and lower coordination, and work continuity have greatly affected progress in work.
15) The district is susceptible to floods. Due to floods and paddy field activities, the works get slowed down.
16) a) As per the procedure accepted for charging the line, submission of test report with details of DTR, HT and LT parameters will be submitted to the Nodal office RE/ASEB.
    b) Nodal officer RE/ASEB will inspect the respective villages' current BPL installation and issue clearance certificate for charging handing over, if work is satisfactory and complies with the REC standard. Sometimes certain verification may also become necessary.
    c) The village charging programme is scheduled by PGCIL and also the average shutdown of existing old lines of APDCL (ASEB), for connection of the new infrastructure installed. However due to communication gaps, charging as well as handling are delayed. Sometimes, it is very difficult to shutdown charge due to shortages of manpower in ASEB.

1. Quality of implementation of RGGVY DPRs in State Districts.

Survey Observations: Dibrugarh District

The RGGVY scheme of Dibugarh District is entrusted to PGCIL by the Government. Indo Power Project Ltd (IPPL), a Calcutta based party is the main contractor.

Altogether, 963 villages at Dibrugarh District have been included for village electrification for the 1st phase and approximately 24,000 BPL beneficiaries have to be given an electric connection. For this purpose, Rupees 68 crore has been sanctioned already, and work has been going on since 2 years.

In practical consideration, it is observed that only 60% to 70% of the individual villages can be electrified with that 68 crores amount. A supplementary DPR for sanctioning extra 20% of Rupees 68 crores has been submitted by PGCIL, DIB and it is at the final stage of approval. If it is sanctioned, then additional 15% to 20% incomplete work of individual

villages can be finished and another 10% of the individual villages can be electrified. But, still 10% of the individual villages will be left out without electrification as stated by PGCIL, DIB.

Out of 24000 BPL list, PGCIL has already identified approximately 12,000 BPL beneficiaries and kits (Meter Box, switch Board etc) have already been installed at houses of approximately 10,000 BPL beneficiaries.

Electrical Circle Infrastructure Development under RGGVY in the five surveyed villages of Dibrugarh District is indicated in Table 12. General information of the district is as under

1. Village electrified and handed over to different sub-divisions for acceptance -119
2. Approval for charging 11KV line and DTRs issued – 350
3. Total BPL beneficiaries received electric facilities – 1700
4. Total work in progress (Both H.T. – L.T.-DTR)- 450 villages.

Table 12: Infrastructure Development under RGGVY in the five villages of Dibrugarh District surveyed

Block	Village Name	Electrification status as per PIA	No of poles		DTRs in KVA			HT length (Kms)	LT length (Kms)	
			HT	LT	10	16	25		1 PH	3PH
Borbaruah	Deori Gaon	Yet to be started	7	8	1	0	0	0.41	0.35	0.00
Lahoal	Gohain Gaon	Electrified	12	8	0	0	1	0.77	0.00	0.33
Moran	Kashipathar Gaon	Yet to be charged	16	17	1	0	0	0.84	0.68	0.00
Tingkhong	Koolie No 1	Yet to be charged	12	6	0	1	0	0.80	0.35	0.00
Tengakhat	Fekelejan	Electrified	13	9	0	1	0	0.70	0.40	0.00

Five villages as allotted by the REC have been surveyed. The survey team consisted of a local technical expert and a Research Assistant from IRADe. The local technical expert was provided by the Implementing Agency. The village president or the ward member of the village was informed beforehand of the visit. The single line diagram and the BPL list

were collected from the Implementation Agency office. It was then confirmed with the panchayat member interviewed in the village.

The village electrification infrastructure was checked on the basis of the single line diagram. Then the households were visited based on the final list. Wherever possible, focus group discussions on RGGVY were also organized.

Findings

Village1: Deori Gaon, Borborua Block (Census code: 01641600)

Profile: The village has 37 households out of which 9 are BPL households. The REDB and VEI have not been developed for the village under RGGVY. The village has an existing line of ASEB. Few households are getting around 16 hours of electricity per day from the existing line. The school and Anganwadi in the village are not electrified.

Electrification Status: The village has been classified as de-electrified village in the DPR. The present status as per PIA is "work yet to be started".

Interview with the Panchayat Member: The Ward member and Head of the village were interviewed. They expressed the fact that it is very difficult to reach the village for carrying out work. The village head also said that most of the villagers in the village are poor and dependent on subsistence agriculture which itself is very much dependent on rainfall.

Village2: Gohain Gaon, Lahual Block (Census code: 01649500).

Profile: The village consists of 27 BPL households. The REDB and VEI have been developed for the village and the charging has been done but no connection has been given to the APL households. Almost all the households are using electricity without any meter. Under RGGVY 12 HT poles and 8 LT poles have been erected. There is one 25 KVA transformer. The length of HT is 0.765 kms and the length of the 3 phase LT is 0.331 kms. Though, the households haven't got electricity connections under RGGVY legally, the survey team asked them questions on the benefits of having electricity in the village. The village gets electricity for more than 12 hours a day on an average but the villagers complained about unavailability of electricity during evening. They mentioned that it is more important to have electricity during the evenings as most of them are out

during the day. The public places like schools, sub centres and Anganwadis have no access to electricity.

Electrification Status: The village has been classified as de-electrified village in the DPR. The present status as per PIA is "electrified".

Village3: Kashipathar, Moran Block (Census code: 01706200).

Profile: The village consists of 46 households out of which there are 10 BPL. The REDB and VEI have been partially developed for the village. The erection of poles as per the single line diagram has been done but the stringing still hasn't been done. 16 HT poles and 17 LT poles were erected. Thus, none of the villagers have received electricity connection under RGGVY. The public places like schools, sub centres and Anganwadis have no access to electricity. A nearby village with existing electricity line was visited to get an understanding of the area. The survey team found out that the franchise is collecting money without proper meter reading and bills.

Electrification Status: The village has been classified as de-electrified village in the DPR. The present status as per PIA is "yet to be charged".

Interview with the Panchayat Member: The President of the village panchayat was interviewed. There are 10 villages under the president including the one we surveyed. None of the 10 villages have received electricity connection under RGGVY. The President says that there are serious delays in implementation of the program. According to her the BPL meters in some of the villages are distributed without electricity. The survey maps for electrification were not properly drawn.

Village 4: Koolie No 1, Tingkhong Block(Census code: 01721300).

Profile: The village consists of 85 households out of which there are 44 BPL households. The REDB and VEI have been developed for the village. 12 HT poles and 6 LT poles were erected and one 16 KVA transformer was given under RGGVY. The public places like schools; sub centres and Anganwadis have no access to electricity. The number of poles as per the diagram is 8 whereas 6 poles were approved and erected under RGGVY. The RGGVY implementation created political problems in the village as all the

households did not get electricity. The line was not charged as the villagers did not allow the implementation agency to charge it.

Electrification Status: The village has been classified as de-electrified village in the DPR. The present status as per PIA is "yet to be charged".

Interview with the Panchayat Member: The President and the Secretary of the Village Panchayat were interviewed by the survey team. Few people from the village were also there during the meeting. The approved number of poles is less than the number of poles shown in the single line diagram. Only few households will receive electricity connections under RGGVY

Village 5: Fekelajan, Tengakhat Block (Census code: 01687800).

Profile: The village consists of 77 households out of which 41 households are BPL households. The REDB and VEI have been developed for the village. The charging has not been done yet. No households have been given the connection. 13 HT poles, 9 LT poles have been erected and one 16 KVA transformer was given under RGGVY. The HT length is 0.7 kms and the LT length is 0.4 kms. The public places like schools; sub centres and Anganwadis have no access to electricity. The village has an existing electricity line which is providing electricity to 10 households but none of the households have meters in their house. The village has no proper road access. The survey team had to walk considerable distance.

Electrification Status: The village has been classified as un-electrified village in the DPR. The present status as per PIA is "electrified".

Interview with the Panchayat Member: The ward member of the village was interviewed. The ward member accepted the fact that it is very difficult to carry out the work in the village. The works was on halt for 4-5 months due to bad roads. Animal transport had to be used to carry materials during the building of the infrastructure.

Conclusions of Dibrugarh Village survey:

None of the households in five villages have received electricity connections under RGGVY. Most of the households are not aware of the RGGVY scheme. There is a lack of co-ordination between the Implementing Agency and the DISCOM. There are a lot of

political problems at the village level, which is hampering the effective implementation of RGGVY. The villagers who have not received connections are not letting the agencies give connections to other approved households. In one of the villages, meters have been given to BPL households even before the infrastructure was set up. The engineers of the contracting firm were beaten up due to slow work by villagers and work was on hold for a while till some local hiring was done. There are considerable infrastructure problems like bad roads and lack of transport which leads to delay in delivery of goods. In addition there are weather constraints which sometimes lead to stoppage of work for few months. During the time of the visit, the cultivation season was going on and erection of poles in the field was not allowed by the villagers which were also leading to delay. There is a huge time lag between building of infrastructure and release of connections in spite of the fact that people are willing to pay for the connections. This might be due to shortage of manpower of DISCOM as the final clearance for Implementation Agency takes time.

Observations:

1. There needs to be proper co-ordination between the Implementation Agency and DISCOM. They should plan together properly, to implement the scheme in a time bound manner.

2. There needs to be sound co-ordination between the villagers, village panchayat and agencies involved in the implementation process. This will help in avoiding the delays due to local political problems as a consensus will be formed before starting the project.

3. Politically motivated activities like distribution of meter before development of infrastructure should be avoided as it hampers the long term welfare goals of the people.

4. The State Government should deploy more manpower towards rural electrification as the employees are overburdened with work which often leads to lack of human resource for rural electrification.

5. The seasonal and weather constraints should be kept in mind before making the implementation schedule.

Interview with the Panchayat Member: No Panchayat representative of the village stays close to the village. The villagers also complained of the unavailability of any public representative. Many of their concerns could not be conveyed due to this.

Survey Observation: Lakhimpur District:

(a) Background: Lakhimpur is the 12th district of Assam as per 2001 census. It is situated in the North Bank of Upper Assam. The mighty Brahmaputra is flowing through the southern part of the district and neighbouring state Arunachal Pradesh is on the north side. Dhemaji and Sonitpur districts border the eastern and western sides of the district. The geographical area of the district is 2277 sq. km. and tea gardens, reserve forests and low-lying areas cover a sizeable area. The Lakhimpur district consists of nine Blocks, namely Narayanpur, Karunabari, Bihpuria, Naoboicha, Boginadi, Lakhimpur, Telahi, Dhakuakhana, Ghilamora. There are 1139 numbers of inhabited villages in the district. The break up of these inhabited villages as per their electrification status is as below**: -**

(i) Electrified villages : 677 Numbers
(a) Presently Electrified villages **:** 503 Numbers
(b) De-Electrified Villages **:** 174 Numbers
(ii) Virgin villages : 462 Numbers
(a) Virgin villages (Non-Remote) **:** 370 Numbers
(b) Virgin villages (Remote) **:** 92 Numbers

The Remote Villages are located in remote areas and are inaccessible from the existing grid. 174 numbers of villages became de-electrified because of damage of the existing infrastructures due to natural calamities such as erosion, flood, storm etc.

(b) Project Objectives: This DPR under RGGVY for Lakhimpur district proposes for electrification of 370 numbers of villages, 174 numbers of de-electrified villages and intensification of 413 numbers of already electrified villages covering 547, 314 and 555 numbers of habitations respectively. The project proposes to provide electricity to 51638

numbers of Rural Households including 34745 numbers of BPL Households. The project aims to cover about 45% of Rural HHs including 100% BPL HHs excluding 2134 numbers of BPL households in remote villages. To achieve 100% BPL HH connections, 8916 numbers of BPL HHs from already electrified villages (not considered in this scheme), are proposed for providing electricity connections. Due to non-availability of readymade data, no. of BPL HHs is assumed to be in between 25% to 30% of the total HHs depending upon the financial status of the villagers of the revenue circles. This is against 21.64 % of BPL households for the state of Assam as per record of Ministry of Rural Development, Govt. of India, in the year 2001. However, the actual number of BPL Households will be assessed only after proper survey during implementation of the scheme.

The total numbers of Remote villages in the districts are 92 numbers Their electrification is challenging task. This is due to the following facts**: -**

i) Isolation of some villages by the river Brahmaputra & its tributaries due to change of their courses.

ii) Some of the villages are located in such area where there are forest reserves on either side. Therefore, extension of the existing network through the forest is not feasible.

The implementation of the scheme will create an additional peak load demand of 7.15 MVA against the existing peak load demand of 12.85 MVA from 132/33, 2x10 MVA Nalkata S/S' which feeds 7 nos of blocks out of 9 nos of Lakh\mpur District and 2 nos of blocks (Majuli and Ujani Majuli) of Jorhat District. The remaining 2 nos of blocks (Dhakuakhana and Ghilamora) under Lakhimpur District are being fed from 132/33 KV, 1x16 MVA Dhemaji S/S under Dhemaji District, present and anticipated peak load demand being 1.0 MVA and 2.1 MVA respectively. The power supply to Lakhimpur district is received from the following sources – From 220/132 KV, 2x50MVA,Samaguri (under Nagaon District) via 132 KV, Gahpur (under Sonitpur District)

(c) <u>Beneficiaries</u>: Through the implementation of the project, it is intended to provide access to electricity to all households within the district including 100% BPL households.

Out of 143412 numbers of total households, only 20827 numbers (14.52 %) have access to electricity at present and with implementation of the project, from the remaining 122585 nos of households, 115202 nos of households will have access to electricity (94.85 %). The balance 7383 nos of households are located in the 92 numbers of remote villages and therefore cannot be provided electricity from the grid. For preparation of the project report and required data collection, the Gram Panchayats and village heads were consulted in many cases and after the implementation of the project; participation will be sought from the Gram Panchayats and other local bodies to make the scheme commercially viable. It is to be mentioned here that the ASEB is presently initiating some schemes for revenue collection in rural areas by involving the actual beneficiaries and similar action will also be taken for the villages to be electrified through this project.

(d) On-going initiatives: In Lakhimpur District, ASEB is presently executing village electrification works out of scheme allocations for the financial years 2002-03 & 2003-04 against RE MNP & PMGY, on 90:10 basis, through "Partial Turnkey" & "Full Turnkey" mode respectively. In "Partial Turnkey Mode", four key items; namely**:** PSC Pole, AAA Conductor, Transformer & PVC cable were supplied by the Board. A total of 11 number of virgin villages are covered under the above schemes (Ref: Annex. These villages are categorised as' electrified villages' in Form C-4.

(e) Technology: It is decided to carry out the proposed project works under "Full Turnkey" mode. The single-phase LT lines have been reduced by ASEB due to problem of imbalance load in sub-transmission network. The villages, which have 5 to 10 numbers of households, will be covered by non-conventional sources. So, 5 / 10 kVA S/S are not considered in this project. This has been agreed in the F.C.C. meeting of the ASEB.

(f) Management Arrangement: The Chief General Manager (RE) will be the Head of the Project Management Wing. He is responsible for floating of tender(s), evaluation and subsequent issuing of work orders. At the field level, works will be supervised by the concerned CEO's of the electrical circles, who is under the administrative control of the Chief General Manager (D) of the respective DISCOM. For necessary assistance to the CEO, there is a Project Manager in each elect. Circle, who is the coordinator among the contractors & field officials at different levels.

(g) Cost Estimates: The detailed Cost Estimates (along with relevant Annexure from I to XXV) & Phasing out of the expenditure is enclosed in Form – A of the DPR

The total estimated cost of the project is Rs. 6764 lakh. This is inclusive of construction of 1 no of 1X2.5 MVA Sub-Station at Raidengia in Ghilamora Block along with associated 33 KV and 11 KV lines. The sub-station has been proposed due to increase of load demand after implementation of RGGVY. This will enable ASEB for electrification of 957 numbers of villages in addition to providing electricity to 34745 numbers of BPL households.

The proposed line parameters of villages under Naoboicha, Narayanpur, Telahi, Dhakuakhana and Ghilamora Blocks, especially of 11 KV lines, are on higher sides, as these Blocks have sizeable low-lying areas and are badly affected by flood water from mighty Brahmaputra and its tributaries every year . Therefore erection of 11 KV lines through shortest route is not possible in many cases. For all round development of these villages, which are located in far away north-east corner of Assam, electrification for the same has been proposed. This has led to the rise in the estimated cost. However, due to fund limitation imposed by M/s R.E.C. Ltd., especially in case of village intensification, the line parameters and substations have been restricted to the bare minimum. So there is likelihood that additional fund may be required to provide access of electricity to 100% households of already electrified villages.

(h) Time frame: The works under the project are scheduled to be completed within two years after sanction of the project.

(i) Success criteria: With the implementation of the scheme, 100% households of the district will have access to electricity and electrification of 100% BPL households (exclusive of habitations of Remote villages) will be completed. At Raidengia at Ghilamora Block, one 1X2.5 MVA; 33/11kV S/S has been proposed and with the construction of this S/S, a major problem of that area will be solved. It is hoped that, after the execution of the project the power scenario of the district will be improved to a great extent.

It is hoped that, after the execution of the project the power scenario of the district will be improved to a great extent.

(j) <u>Sustainability</u>: ASEB is planning to manage the revenue collection and maintenance of the village areas by involving various agencies at the Panchayats & village level. Already, such schemes have been implemented by ASEB successfully on experimental basis in few areas. Further, several initiatives have also been undertaken by ASEB to encourage villagers to take service connection through simple procedure and reduced cost. Such steps will help a lot in sustainability of this project.

(k) <u>About new 33/11 KV S/S :</u> 1 no. of 1x2.5 MVA, 33/11 KV Sub Station has been proposed at Raidengia in Ghilamora Block. There is no Sub Station in Ghilamora Block at present.

(l) <u>About supply of electricity to BPL H/Hs in already electrified village habitations not proposed in the Scheme :</u> No infrastructure has been proposed in 548 no.s of already electrified village habitations. The existing infrastructure is sufficient to provide electricity to all BPL households of these villages. Only BPL connections (8916 no.s) have been proposed in these villages.

Village Pariculars (General) of Lakhimpur:								
Name of the block	Name of the village	village census code	sarpanch name	Total no. of families (in village	Total no. of BPL	Electricity provided (BPL)	Total no. APL	Electricity provided (APL)
Boginadi	Goriamari	1325900	Montan Basing	**79**	**54**	**10**	**25**	**7**
Dhakuakhana	Lahibari	1357700	Putuli Barua	**26**	**18**	**7**	**8**	**7**
Ghilamara	Barkalia NC	1373200	Kiran Patir	**11**	**8**	**1**	**3**	**3**
Karunabari	Nijlaluk	1287300	Dibyajyoti Hazarika	**28**	**22**	**16**	**6**	**Nil**
Narayanpur	Majgaon	1277200	Munindra Deori	**60**	**35**	**8**	**25**	**Nil**

The remote villages are located in remote areas and are inaccessible from the existing grid. 174 villages were de-electrified because of the damage to the existing infrastructure due to natural calamities such as floods, storms and erosion.

Electrification of 370 virgin villages and 174 de-electrified villages is proposed as well as intensive electrification of 413 already electrified villages- covering 547, 314 and 555

habitations respectively. It is planned to provide electricity to 51638 rural households, including 34745 BPL households.

There are 92 remote villages having 2130 BPL households. The reason for their being considered remote is –

I. Isolation of some villages by the rivers Brahmaputra and its tributaries due to change in their courses.

II. Some of the villages are located in areas that are notified as forest reserve. Therefore extension of the existing network is not feasible.

In majority of the blocks within the districts, electricity will be fed from the Nalkata 132/33 KV 2×10 MVA grid S/S and in the remaining two blocks from the 1×10 MVA 132/33 KV Dhemaji S/S.

In many cases it has been observed that the GP has not maintained electrification records (kept any date of electrification). In certain cases, they could not even give the list of BPL households. Their involvement in their matter is not satisfactory. There is every possibility of manipulation in the name of beneficiaries. It has been noticed that the BPL individuals have not benefitted by the service connection. To cite one specific case- though in the list, the name of the eldest lady of the family is there, the benefit has been given to eldest son. There is every possibility of using fake names of the beneficiaries.

Though the service connection of BPL households should be provided without any charge by the contractor, there are complaints that the sub-contractors are asking for money in the range of Rupees 1500 to 2000 per household for the connections.

In a particular village, through the listed connections shown within July 11, it has been observed that only electrical items are handed over to them but no service connection. It is also reported that some families are passing even for the post along with transport of the same which amounts to Rs.1500-2000/-. This is perhaps by same middle man or sub contractor.

In one village, people reported paying the cost of a new transformer when the old was damaged. Besides it is reported that most of the households are paying for their connections, to the sub-contractor/ middleman, and this is not known to the department.

The department has given public notices in the newspapers and also to the local panchayat, but people have indulged in various types of malpractices for getting their electricity.

Many unauthorized connections are found in the district. They are taking the advantages of in-accessibility of the village due to logistics constraint of the department. Though many villages have paid their connection deposits to the department, connections are not done. The O&M activities in that infrastructure will be a challenging job due to the shortage of manpower and the vigilance of the department. No franchisee has come forward to the area of the electrified villages and the performance of old franchisee working in the district is not at all satisfactory.

The consumer connections in the newly electrified village are very few, although the infrastructure for electricity connection already exists. The department has not taken proper initiative- most probably to avoid the additional work load and since they will have to maintain the infrastructure due to shortage of manpower. Due to this, people have taken unauthorized connections, which in turn heightens the overall AT & C losses of APDCL

Survey Observation of Karbi Anglong district

(a) <u>Background:</u> KARBI ANGLONG is the 19th District of Assam as per 2001 census. The Karbi Anglong District is situated in the central part of Assam. It is bounded by Golaghat district in the east, Meghalaya state and Morigaon district in the west, Nagaon and Golaghat district and Nagaland sate in the south. The district with dense tropical forest covered hills and flat plains is situated between 25^0 33' N to $26^0$35' N Latitude and $92^0$10' to $93^0$50' E Longitude. Majority of the population of the District are Karbis. The Karbis, mentioned in the Constitution Order, Govt. of India, constitute an important ethnic group in the hill areas of present Assam. Although at present they are found to inhabit mainly in the Karbi Anglong District. The Karbis, like other hill tribes, have a tendency to live on the hill tops. To electrify or any other construction works, material are to be carried by head and those materials also are to be carried from far away places as it is very much underdeveloped district. Hence cost of carrying the material is very much high and time consuming. The geographical area of the district is **10434** Sq.km.

The Karbi Anlong district consists of 11 (eleven) Blocks namely:- Amri, Chinthong,Socheng,Rongkhag,Lumbajang,Howraghat,Somelangso,Rongmongway,Long somepi, Bokajan and Nilip .There are, out of **2931** numbers villages: **2634 numbers are populated villages** (including Remote villages & excluding of **297** numbers of zero populated villages) in the District, the break up of which as per electrification status is as below. Out of **562 numbers of already electrified** villages, **126 numbers are De-electrified**. There are **2198 (Un Electrified 1254+ De-Electrified 126)** numbers of villages of which **818** numbers are declared remote in the district. Now **1254** numbers Un-Electrified villages and **126** nos de electrified villages are proposed in this scheme.

Block	Total Numbers of Villages	Zero Populated Villages	No. of Inhabited Villages	Electrified Villages (Electrified + De Electrified)	Remote Villages	Un Electrified Villages.
Amri	151	5	146	19	35	92
Chinthong	104	9	95	23	26	46
Socheng	116	3	113	79	11	23
Rongkhag	194	2	192	31	22	139
Lumbajang	379	36	343	77	62	204
Howraghat	535	13	522	164	150	208
Somelangso	190	25	165	29	71	65
Rongmongway	233	20	213	14	180	19
Longsomepi	282	10	272	50	105	117
Bokajan	522	144	378	48	86	244
Nilip	225	30	195	28	70	97
Total	**2931**	**297**	**2634**	**562**	**818**	**1254**

(b) <u>Project Objectives</u>: This DPR under RGGVY for **KARBI ANGLONG** district is prepared for electrification of **1254** numbers Un-Electrified villages, **126** numbers of De-Electrified villages and Intensification network in **436** numbers villages with free access of electricity to all the BPL beneficiaries.

The line loss & voltage regulations are not within the limit in the district. However the same will be looked into from ASEB's own resources or from other's sources if any circumstances arise for augmentation/installation etc. of the network in future.

The project proposes to provide electricity to **62467** numbers of rural households, which includes **31504** numbers of BPL households. The project will cover 61% of Rural households including 100% BPL households. Due to non-availability of readymade data, no. of BPL household is assumed to be in between 25% to 45% of the total household depending upon the financial status of the villagers of the respective blocks. This is against 21.64% of BPL households for the state of Assam as per record of the ministry of Rural development, Govt. of India for the year 2001. However, the actual number of households will be assessed only during implementation of the scheme.

In brief, the implementation of this project shall accomplish the vision of "100% village electrification by 2009 and electricity for all by 2012"

(**C) Beneficiaries**: Through the implementation of the project, it is intended to provide access to electricity to all households within the district including 100% BPL households. Out of **101423** numbers (Excluding Remote villages) of total households only **20475** numbers (20%) have access to electricity at present and with implementation of the project, the remaining **62467** numbers (77 %) of households will have access to electricity. **818** numbers of Remote villages with **23716** numbers of rural households with **11908** numbers BPL Households are not considered in this scheme .However, they will be considered through **MNES**. For preparation of the project report and required data collection, the Autonomous District Council and village heads were consulted in many cases and after the implementation of the project; the **Autonomous District Council** and other local bodies participation will be sought to make the scheme commercially viable. It is to be mentioned here that the ASEB is presently initiating some schemes for revenue collection in rural areas by engaging franchisees and similar action will also be taken for the villages to be electrified through this project. After implementation of the scheme, the socio economic scenario of the District as a whole will improve along with the revenue boost up.

(d) On-going initiatives: In **KARBI ANGLONG** district, ASEB is presently executing village electrification works out of scheme allocations for the financial years 2002-03 & 2003-04 against RE MNP & PMGY, on 90:10 basis, through "Partial Turnkey" & "Full Turnkey" mode respectively. In "Partial Turnkey Mode", four key items; namely**:** PSC Pole, AAA Conductor, and Transformer & PVC cable were supplied by the Board.

Voltage regulation in some 33 & 11 KV lines are high and they will be considered in due time by ASEB.

(e) Technology: It is decided to carry out the proposed project works under "Full Turnkey" mode. The single phase LT lines have been proposed only although ASEB tries to reduce single phase LT line due to problem of imbalance load in sub-transmission net-work. The villages, which have 5 to 10 numbers of households, will be covered by nearby higher rating DTR. So, 5/10 KVA S/S are not considered in this project. This has been agreed in the F.C.C meeting of the ASEB.

(f) Management Arrangement: The CGM (RE) will be the Head of the Project Management Wing. He will be responsible for floating of tender(s), evaluation and subsequent issuing of work orders. At the field level, works will be supervised by the concerned CEO's of the electrical circles, who are under the administrative control of the CE (D) of the respective DISCOM. For necessary assistance to the CEO there is a Project Manager (RE) in each elect. Circle, who is the coordinator among the contractors & field officials at different levels.

(g) Cost Estimates: The detailed Cost Estimates (along with relevant Annexures) & Phasing out of the expenditure is enclosed in Form – A of the DPR.

(h) Time frame: The works under the project are proposed to be completed within two years after sanction of the project.

(j) Success criteria: With the implementation of the scheme, 100% households of the district will have access to electricity and 100% BPL household electrification will be completed.

(k) Sustainability: ASEB is planning to manage the revenue collection and maintenance of the village areas by involving various agencies at the Council & village level. Already, such schemes have been implemented by ASEB successfully on experimental basis in few areas. Further, several initiatives have also been undertaken by ASEB to encourage villagers to take service connection through simple procedure and reduced cost. Such steps will help a lot in sustainability of this project.

The Karbi Anglong district is situated in the central part of Assam. The area within the district has dense forest cover, with hills and flat plains. Majority of the population of the district are Karbis. The Karbis, mentioned in the constitution codes, GoI, constitute an

important ethnic group in the hill area of present day Assam. They are mainly found inhabiting in the Karbi Anglong district. The Karbis, like other hill tribes have a tendency to live in the hill tops. For electrification, or for any other construction works, materials have to be carried from faraway places, as it is very much an under-developed district. There are a total of 2931 villages, out of which 2634 are populated villages and 297 are zero populated villages. 818 villages are remote villages, which cannot be electrified through conventional methods. Out of the total 818 villages, 562 villages are already electrified and 126 are de-electrified (un-electrified 1254 + de electrified 126). Now these 1254 un-electrified villages and 126 de-electrified villages are proposed in the scheme for electrification.

Surveyed Village Particulars of Karbi Anlong								
Name of the block	Name of the village	village census code	sarpanch name	Total no. of families (in village	Total no. of BPL	Electricity provided (BPL)	Total no. APL	Electricity provided (APL)
Bokajan	Christan Gaon	2296400	Ajoy Singnar	62	62	21	Nil	Nil
Howraghat	Dighilati gaon	2200900	Bali basumatary	61	52	29	9	Nil
Lumbajang	Pattor Gaon	2124300	Jonasing Bey	60	26	23	34	Nil
Bokajan	Lekthe Gaon	2321500	Boron Teron	22	22	6	Nil	Nil
Semelangso	Maghar Bosti	2247700	Baini Majowar	110	82	39	28	Nil

Summary

- Total number of Villages : 2931
- Zero populated villages : 297
- Number of Inhabited villages : 2634
- Remote villages : 818
- Un-electrified villages : 1254
- De-electrified villages : 126
- Proposed number of households for Electrification : 62467
- BPL consumers : 31504

The total area of the district is 10434 square km, in which 10347 square km from the rural area. The area under forest cover is about 4922 square km.

Survey work of this district of the RGGVY scheme was started in March 2009. Due to verification in the topography, survey of the HT/LT line in this hilly zone is found to be very difficult in some of the villages.

Supply of the material at the work site is also found very difficult due to bad conditions of the village road and bridge. The PWD department does not allow movement of trucks through certain areas as the bridges are weak and not healthy for the steel tubular poles and materials are manually carried by labour or the soldiers at the work site. But with the co-operation of the villagers, electrification of 1816 villages i.e. 70% of the total declared, has been completed. Out of 31504 BPL households sanctioned, 20000 connections have been released.

Due to the vast forest area, some of the villages are under the reserve forest area. So the execution of those villages could not be started because of the problems raised by the forest department.

The district is a store house of bamboo production. This is creating problems in drawing the lines and it seem to be that in the future, the O&M of the line will be problematic.

It is also reported that the theft of energy has increased due to inaccessibility. It will be difficult to stop this as all these reported villages are located in remote places and there are no motorable roads. There are shortages of manpower in APDCL to look after the routine monitoring and to detect unauthorized connections. Meanwhile reports of transformer burning have been verified, though the contracting firms have replaced them since the damage occurred within the liability period. However in future, any damage to the transformer and other infrastructural restoration will take more time, which may create an undesirable situation. The district has suffered politically due to insurgency problems. There are all together 8-9 insurgent groups operating in the district. Generally they have a tendency to disturb the contracting firm by demanding money and other extra benefit. Again, certain underground organizations have also got the tendency to collect the so called “donation”.

Still the contracting firm has given over 4 packages within November and December 2011. The APL connections in the district are not satisfactory due to following fact:

- Charge of the overloading transformer.
- Shortage of Manpower in APDCL.
- The theft of energy noticed frequently, which will cause the AT&C loss.

Survey Observation: Tinsukia District (UNDER ASEB)

(a) Background: Tinsukia is the 14th District of Assam as per 2001 census. It is situated in the northern part of Assam and is surrounded by Arunachal Pradesh on the north and the east, Dibrugarh district on the west and the Sivsagagar district on the south. The mighty Brahmaputra flows through the northern part of the district. The geographical area of the district is 3790 sq. km. and tea gardens, reserve forests and low-lying areas cover a sizeable area.

The Tinsukia district consists of four circles, namely**:** Sadiya, Doomdooma, Tinsukia and Margherita. There are 1107 numbers of villages in the district. The break up of the villages as per their electrification status is as below**: -**

i)	Electrified villages	**:** 824 Numbers
	(a) Already electrified Villages	:725 Numbers
	(b) De-Electrified Villages	**:** 99 Nos
ii)	Virgin villages	**:** 283 Nos
	(a) Non-Remote	: 251 Nos
	(b) Remote Villages	**:** 32 Nos

The Remote Villages are located in remote areas and are inaccessible from the existing grid. The 99 numbers of villages become de-electrified because of damage of the existing infrastructures due to natural calamities such as erosion, flood, storm etc.

(b) Project Objectives: This DPR under RGGVY for Tinsukia district proposes to construct 1 no. of new 33/11kV sub-stations to help electrification of 251 numbers of virgin & 99 numbers of de-electrified villages and intensification of 725 numbers of already electrified villages covering 322, 109 and 920 numbers of habitations respectively. The project proposes to provide electricity to 62132 numbers of Rural Households including 44548 numbers of BPL Households. The project aims to cover 45% of Rural HHs including 100% BPL HHs excluding 720 numbers of BPL households in remote villages. To achieve 100% BPL HH connections, 11786 numbers of

BPL HHs are proposed to be covered from villages, which are already electrified but not considered in this scheme. Due to non-availability of readymade data, numbers of BPL HHs is assumed to be in between 25% to 30% of the total HHs depending upon the financial status of the villagers of the revenue circles. This is against 21.64 % of BPL households for the state of Assam as per record of Ministry of Rural Development, Govt. of India, in the year 2001. However, the actual number of BPL Households will be assessed only after proper survey during implementation of the scheme.

After extensive field survey, the total numbers of Remote villages are found to be 32 numbers.

The implementation of the scheme will create an additional demand of 9.35 MVA against the existing demand of 48.2 MVA The power supply for Tinsukia district is received from

(i) Namrup Thermal Power Station to Tinsukia and Ledo Grid Sub-Station by 132 KV System, connected with 2x20 MVA and 2x10 MVA Power Transformers respectively.

(ii) Kathalguri Power Station to Tinsukia Grid Sub-Station by 220 KV System, 2x50 MVA Power Transformers, 132/66 KV System, 3x20 MVA Power Transformers and 66/33 KV, 1x20MVA.

The present system will be able to cater the additional demand after implementation of the scheme.

(c) <u>Beneficiaries</u>: Through the implementation of the project, it is intended to provide access to electricity to all households within the district including 100% BPL households. Out of 174399 numbers of total households only 19324 numbers (11.08%) have access to electricity at present and with implementation of the project, the remaining 153193 numbers (87.84 %) of households will have access to electricity excluding the households in the 32 numbers of remote villages, which are 1882 numbers For preparation of the project report and required data collection, the Gram Panchayats and village heads were consulted in many cases and after the implementation of the project; the Gram Panchayats and other local bodies participation will be sought to make the scheme commercially viable. It is to be mentioned here that the ASEB is presently initiating some schemes for revenue collection in rural areas by involving the actual

beneficiaries and similar action will also be taken for the villages to be electrified through this project.

(d) <u>On-going initiatives</u>: In Tinisukia district, ASEB is presently executing village electrification works out of scheme allocations for the financial years 2002-03 & 2003-04 against RE MNP & PMGY, on 90:10 basis, through "Partial Turnkey" & "Full Turnkey" mode respectively. In "Partial Turnkey Mode", four key items; namely**:** PSC Pole, AAA Conductor, Transformer & PVC cable were supplied by the Board total . A total of 30 numbers of previously virgin villages are covered under above schemes and therefore these villages are considered are electrified villages.

(e) <u>Technology</u>: It is decided to carry out the proposed project works under "Full Turnkey" mode. The single phase LT lines have been reduced by ASEB due to problem of imbalance load in sub-transmission net-work. The villages, which have 5 to 10 numbers of households will be covered by non-conventional sources. So, 5 /10 kVA S/S are not considered in this project. This has been agreed in the F.C.C. meeting of the ASEB.

(f) <u>Management Arrangement</u>: The CE (RE) will be the Head of the Project Management Wing. He will be responsible for floating of tender(s), evaluation and subsequent issuing of work orders. At the field level, works will be supervised by the concerned CEO's of the electrical circles, who is under the administrative control of the CE (D) of the respective DISCOM. For necessary assistance to the CEO, there is a Project Manager in each elect. Circle, who is the coordinator among the contractors & field officials at different levels.

(g) <u>Cost Estimates</u>: The detailed Cost Estimates (along with relevant Annexure from I to XXV) & Phasing out of the expenditure is enclosed in Form – A of the DPR

Though the total cost of the project is Rs. 5500 lakh, the estimated amount against 8 numbers of 1X2.5 MVA Sub-Stations along with associated 33 KV lines are not considered for funding under RGGVY. This is inclusive of providing electrical connections to 11786 BPL households in 287 nos .of already electrified villages not covered under RGGVY, where existing network is sufficient to cater the need of electrification.

Due to existence of sub-stations in respective blocks, the sub-stations, as referred above, could not be proposed in RGGVY as per guideline of M/s REC Ltd. However the installation of these sub-stations are very essential to keep Voltage Regulation within permissible limit. For this purpose, assistance from M/s REC Ltd./ other financial institutions will be sought.

Due to fund limitation imposed by M/s REC Ltd., especially in case of intensification of villages, a bare minimum of the line parameters and sub-stations have been proposed. So there is likelihood that additional fund may be required to provide access to 100% households.

(h) Time frame: The works under the project are proposed to be completed within two years after sanction of the project.

(j) Success criteria: With the implementation of the scheme, 100% households of the district will have access to electricity and 100% BPL household electrification will be completed. In Sadia Circle, one 2X2.5 MVA; 33/11kV S/S has been proposed and with the construction of this S/S, a major problem of that area will be solved. Further, eight additional 1X2.5 MVA; 33/11KV S/S are proposed considering the present load and future load growth in the district. For these eight S/S, financial assistance in the form of loan from other financial institutions will be explored. It is hoped that, after the execution of the project the power scenario of the district will be improved to a great extent.

(k) About new 33/11 KV Sub-Station: The 33/11 KV Sunpura S/S is in the state of Arunachal Pradesh. As there exists no 33/11 KV SSs in Sadiya block, a new 2x2.5 MVA, 33/11 KV has been proposed.

(l) About remaining 287 numbers already electrified villages : No infrastructure has been proposed in 287 numbers already electrified villages. The existing infrastructure is sufficient enough to provide access of electricity to all households of these villages. Only BPL connections (11786 Numbers) have been proposed in these villages.

(m) Regarding use of RS Joist poles in Sadiya block : The Sadiya block is situate across the river Brahamaputra and and the soil is sandy. The lines, 33/11KV S/S has been proposed on RS Joist Poles considering the soil condition and difficulty involved in transportation of poles.

In Tinsukia District, the total infrastructures created are as follows:

Table 11: Infrastructure in Tinsukia District

Sl No.	Infrastructure particulars	As per LOA	Executed
1	11 KV line	892.55 Km	874.55 Km
2	LT 1 ph 2 w line	723.20 Km	1062.775 Km
3	16 KVA DTR	359	419
4	25 KVA DTR	366	419
5	BPL service connection	44548	51548

From the above it is observed that except for the 11KV line, excess amount of works have been executed as mentioned below:

LT 1 ph 2 w lines: 339.575 km

BPL service connection: 16 nos

25 KVA DTR: 53

16 KVA DTR: 7000

The total package amount including supply and erection was Rupees 64.66 Crore. The contracting firm submitted the bills for extra works carried out by them to the APDCL. Within the district, 16 villages couldn't be located. Three villages now do not exist in Margherita region where now the North-east coal field of Coal India Ltd is located. Perhaps the inhabitants had left the area quite a long time. The Sadia Block also was located on the other bank of the river Brahmaputra where normal transports are not available.

The contracting firm of APDCL has faced a lot of problems in the execution of the job, especially in send their materials to the site by ferry. All these areas are flood prone, and normal transport itself is disturbed for atleast 6 to 8 months. However contracting firm has executed the contracts despite the additional troubles and work also.

It is also gathered that the revenue return from the villages electrified is not at all satisfactory due to in-convenience of transport facility. The movement of meter readers and dispatch of electricity bills are difficult. Though the entire infrastructure had been taken care of by the APDCL, their effort for the service connection to the APL category of consumer is very less, due to which unauthorized connections are noticed almost everywhere. This will increase the loss of revenue and it will contribute the AT & C loss also. Also, the APDCL has got shortage of manpower on all fronts of task execution. The operations and maintenance of infrastructure already created will be some-what

troublesome. The theft of energy will also increase as the infrastructures created connect not catch the demand of the consumer that includes unauthorized connection. At a later date, there are every possibilities of over loading the transformer, which may damage the DTR as well as created infrastructure.

Survey Information of Villages in Tinsukia District								
Name of the block	Name of the village	village census code	sarpanch name	Total no. of families (in village	Total no. of BPL	Electricity provided (BPL)	Total no. APL	Electricity provided (APL)
Kakopather	Bokapathar	159880 0	Kakopathar	125	90	55	35	nil
Saikhowa	Puali pathar NC	152820 0	Hakhati	110	70	10	40	nil
Margherita	Lama gaon	161350 0	Vitar Pawei	250	220	47	30	nil
Hapjan	Lesengkar Gaon	155220 0	Barekuri	128	108	96	20	nil
Saikhowa	Chengeli Gaon	153740 0	Dhola-Dhadum	130	90	59	40	nil

No franchisee is interested in taking up an area which is newly electrified village due to in-accessibility as well other unwanted reasons. APDCL has initiated action to allot the feeders. The social environment is also not conducive and it has been a total failure to handle situation, which is not up to the mark. The consumers have resentment about the power supply and this is creating an uncomfortable atmosphere. They are also not willing to pay the electricity bill unless quality of electricity is not improved.

Though there is lot of unauthorized connection in the electrified villages, till now not a single transformer is damaged during the defect liability period due to the constant watch and sincere effort of the contracting firms.

Observation of Dhubri District (RGGVY Survey)

The Dhubri District is situated in the western most part of lower Assam. The geographical area of the district is 2838 sq. km and most of the area is cultivated.

There are 1261 inhabited villages in the district, the breakup of which, as per their electrification status, is as described below:

1. Electrification villages : 1042

2. Presently electrified : 782
3. De- electrified villages :260
4. Un-electrfied village : 133
5. Remote Village : 86
6. Total Number of Rural Households : 260558

Surveyed Village Pariculars (General) Dhubri								
Name of the block	Name of the village	village census code	sarpanch name	Total no. of families (in village	Total no. of BPL	Electricity provided (BPL)	Total no. APL	Electricity provided (APL)
Rupsi	Rupsi Part ll	113600	Samsul Haque	76	16	16	60	nil
Bilasipara	Siberdabri	183800	Ajit Nath Sharma	45	22	22	23	5
Birshingjaura	Fulkatari	160400	Vitar Pawei	250	220	47	30	nil
Chapar-Salkocha	Segunjari	196200	Barekuri	128	108	96	20	nil
Fekamari	Kalir Alga Pt.l	1537400	Abdullah Ashiq	156	136	67	20	nil

The Dhubri district has 260,558 rural households distributed over 1261 villages, out of which 86 villages have been given the status of remote- amounting to a total population of 14937 households. We found that out of the total 83398 BPL households, 74274 are considered in the RGGVY electrification scheme. Out of this total, 34531 connections are to be achieved completely till Oct, 2011. There are a total of 393 un-electrified villages covered for electrification. In Dhubri, erection and commissioning of total works including intensification, electrification, DTR installation work are in progress with a completion percentage of around 80%.

Summary:

1. 11KV line (Kms.) : 974.70
2. 3 ph LT : 93.30 (kms)
3. 1ph LT : 1348.60 (Kms.)
4. 16KV DTR : 1173
5. 25 KV DTR : 252

6. BPL Connection: 747274 have to be completed for total project of Dhubri district.

The project is lagging behind due to the following reasons.

- Inaccessibility to the prescribed village due to bad road conditions.
- Particularly, South Salmara, Fekamari and Mankachar block are located in the interior area, and due to areas are linked to main town without bridges to communicate, people are communicating by small country boats. Therefore carriage of materials for the project is always a matter of concern.
- During the survey it had also been found that the villagers are always creating obstructions as some of these villages are not included in the project. Ultimately construction works are lowered.
- Even the included villages where project work is completed and ready for charging, there is significant delay due to obstruction and objection from the nearby villagers for the same above concern.
- Due to insurgency as well as frequent bandhs and road blocks by different organization for some specific demands, the work progress is jeopardized.
- RE work for drawing LT line is also affected in some villages, due to jungles and bamboos, which locals are objecting on clearing.

As usual many unauthorized connections are found in the District, taking advantage in the inaccessibility of the village and also the negligence of the department. Though many villages are handed over to the department, regular bill/connections are not done. The O&M activities in that infrastructure will be a challenging job due to the shortage of manpower and the vigilance of the department. No franchisee has come forward to this area for electrifying the villages and the performance of the old franchisee working in the district is not at all satisfactory.

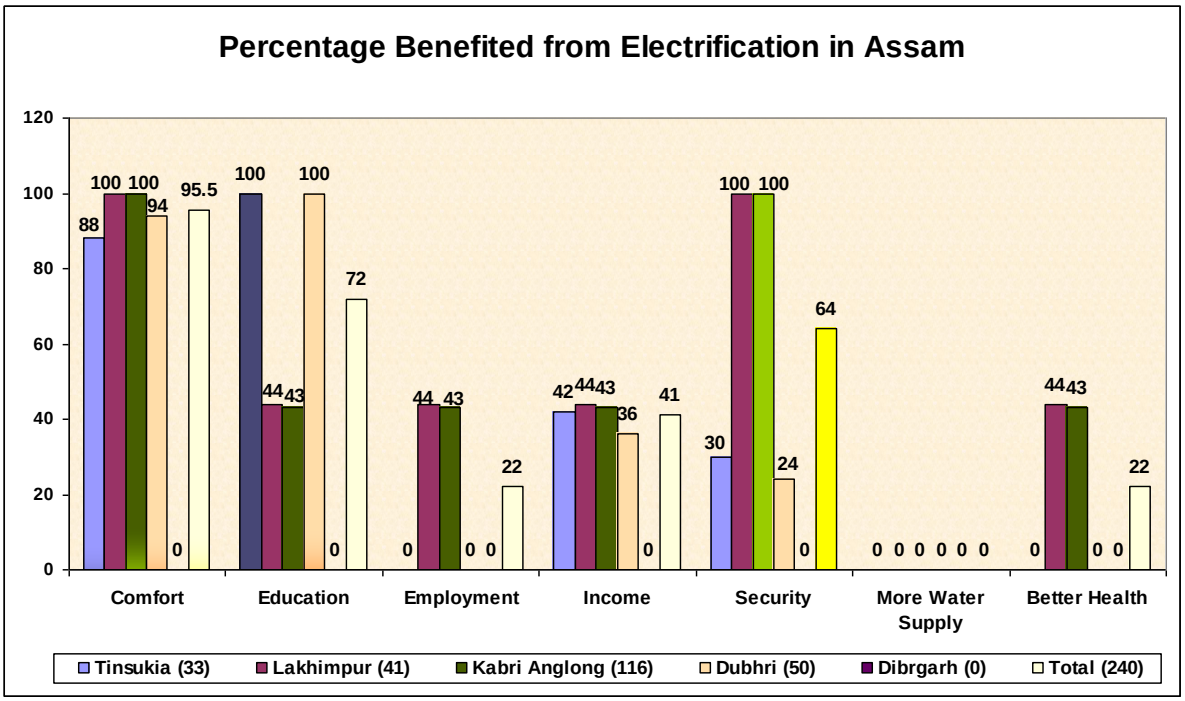
Due to this, the people have taken the law in their own hands. A number of unauthorized connections prevailed in most areas and this enhances the overall AT &C losses of APDCL. Though there are many challenges in smooth progress of the work, the department and contractors have taken up the work in good spirit and co operation is found to be in order generally. However the involvement of the panchayat could not be judged properly as we couldn't interact with competent persons.

The household number in the surveyed hamlets/ villages in upper Assam, and Karbi Anglong are quite less, and they are surrounded by natural constraints of periodic floods etc. These communities need special capacity building to enhance their economic position. The various programmes of the government of India such as Bharat Nirman etc should be so designed to enable them to generate additional income using benefits of electrification.

Summary of Impact of Village Survey

The respondents of the survey were asked about the benefits there perceivably felt after electrification. Their responses are displayed in the figure below.

Figure 5- . Improvements in standard of living with electrification in Assam



Out of all the choices, nearly 96% of the population said that they were more comfortable now, as they are able to use electrical appliances like lights, fans, mobiles, radios and television. Another 72% responded that with electricity, there was a decided improvement in the level and access to education. There is also evidence of improved security as was told by nearly 64% of the households. Increases in income were reported by nearly 41% of the respondents, while 22% reported increases in income and reduced unemployment as benefits.

As far as the gains of upon education is concerned, we see from the previous figure 6 that out of the total 13 schools, there are only 23% schools that were electrified. Out of this total figure, we find that there are both lighting and fans present in 31% of the schools. Only around 8% of the schools boasted of computer facilities and another meagre 15% reported restroom facilities. Also, there were no schools with a water supply. Lakhimpur and Karbhi Anglong are both districts which have better results in the reported electrification benefits to schooling.

Figure 6: Electrical facilities in School

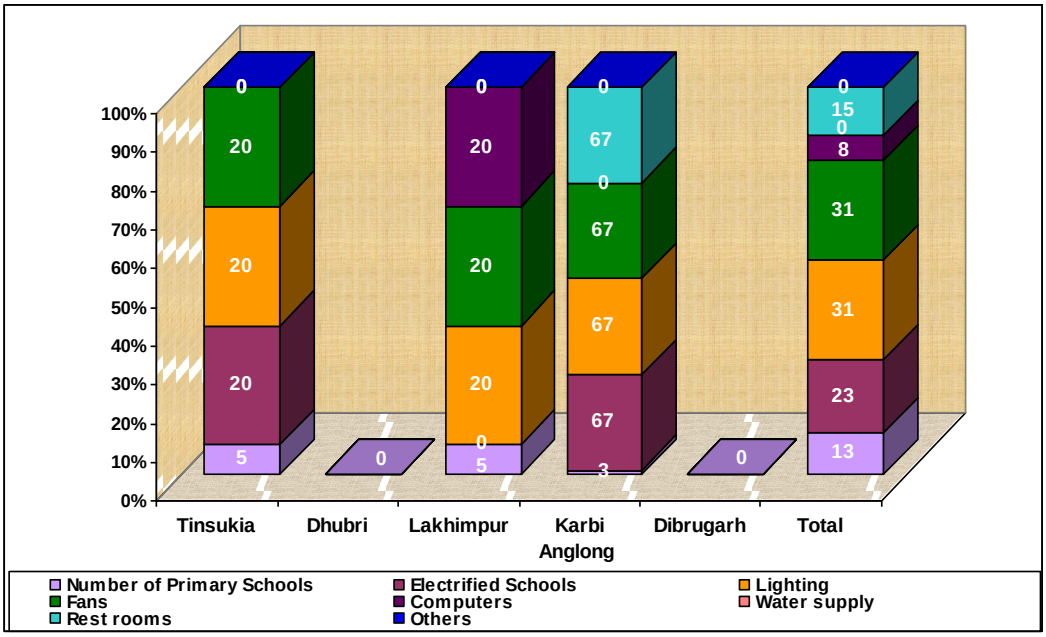
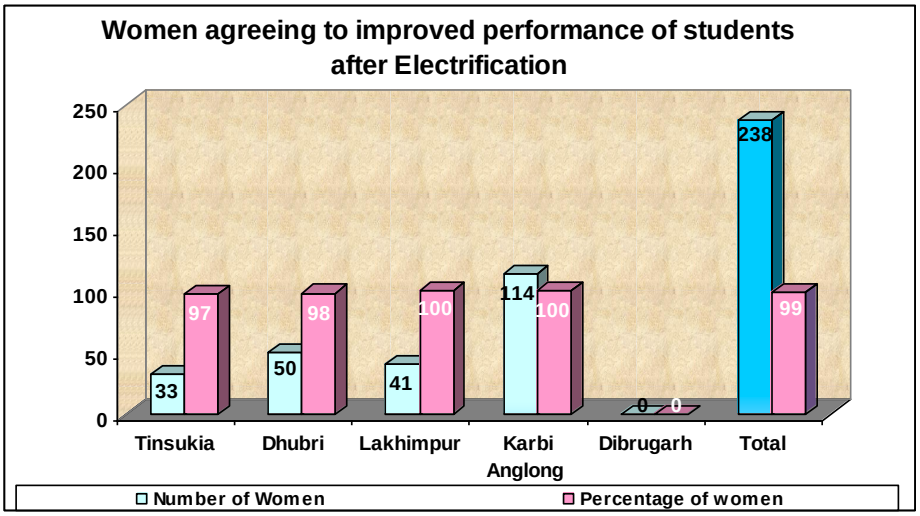
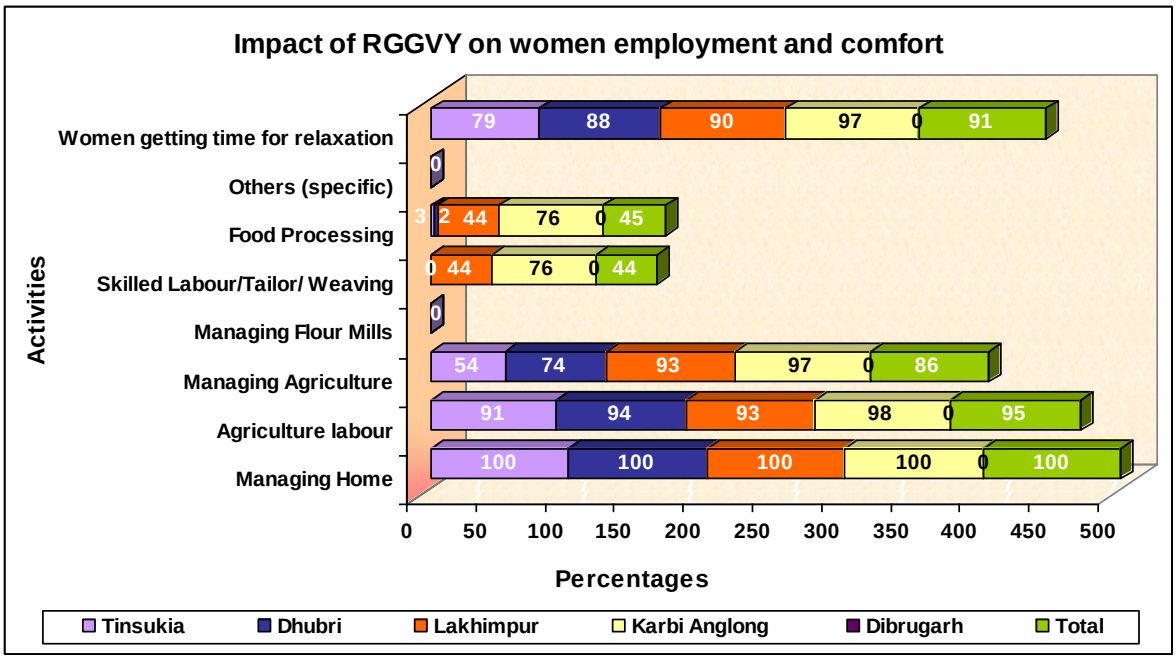


Figure 7: Improvements in students' performance after RGGVY



As can be seen from the figure 7, around 99% of the women agreed that after electrification, their children have had better academic performances and records. In fact, all the women in Karbhi Anglong and Lakhimpur attested to this.

Figure 8. Benefits of RGGVY felt by women in Assam



To assess the impact of RGGVY we examine the benefits to electrification that women reported. All of the respondents agreed that they are better able to manage their homes after access to electricity. Agricultural labour, managing agriculture and additional time for relaxation were other benefits that are largely felt by women after electrification. Some women even felt that they were able to perform duties like food processing and tailoring/weaving more adroitly (see figure 8).

The Gram Panchayats issue the Electrification completion certificates (refer to Annexure 5) for the villages under his jurisdiction. The completion is also followed by erection of RGGVY certificate for the village. The statuses of progress of installation of signboard under RGGVY as on 15.10.2011 for the districts are shown in Annexure 3.

We cannot make a general statement regarding the awareness of the RGGVY programm in Assam as the response rate of the questioning was un-evaluable. Villagers, it appeared that were in know that team from Delhi had come for survey, and knew the context.

Instances of BPL electrical connection being disconnected, after connection was released to them under RGGVY, were not observed in the surveyed villages. This may be due to no meter reading & billing in most cases. However in three villages in Dibrugarh and other districts the assets were not handed over as per protocol.

In view of the above observations (Villages Surveyed -25), as a consolidation it is observed that 32% of rural households have been electrified. This includes 44% BPL HH is electrified, (REC website indicates 69% BPL Household has been electrified at the State Level). The value of total APL and BPL population and beneficiary is indicated in Table 8. During survey few APL households electrification were observed (only 22 APL have been electrified out of total 642 APL household). 3 villages in Dibrugarh districts are yet to be electrified. This has lowered the figure of beneficiary percentage of BPL and APL household. DISCOM.

Response on power availability varied from district to district. This can be a measure of level of satisfaction observed on RGGVY villages. The villagers in Dhubri and Tinsukia receive approximately 16 hours of power. Consumers of Dibrugarh had complaints and they received 8 hours of supply. The villagers mentioned that their main demand was continuous supply in the evening hours.

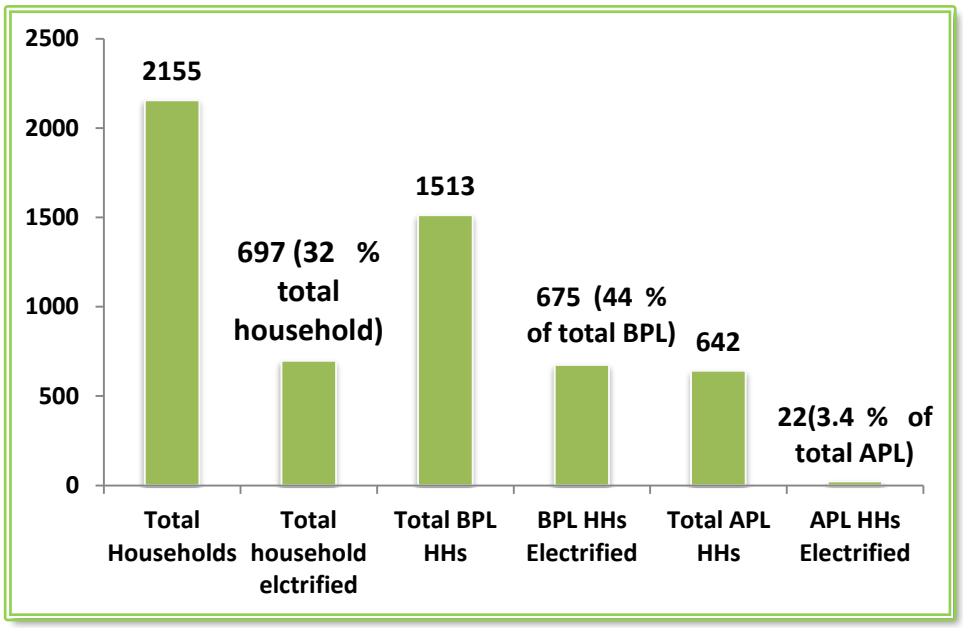


Figure 8A, Status of RGGVY in surveyed villages in ASSAM,

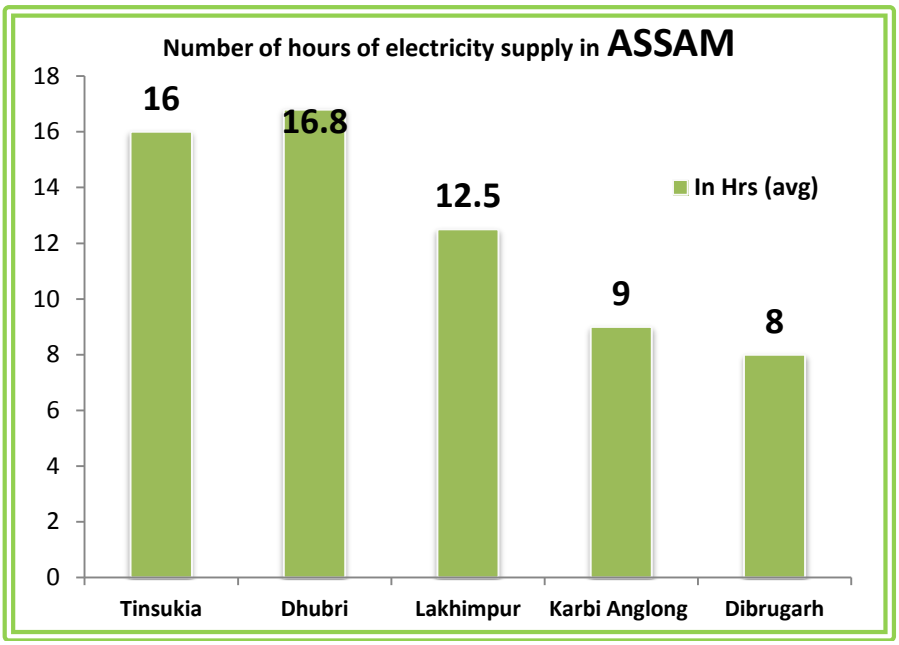


Figure 8B: Number of Hours availability of Power

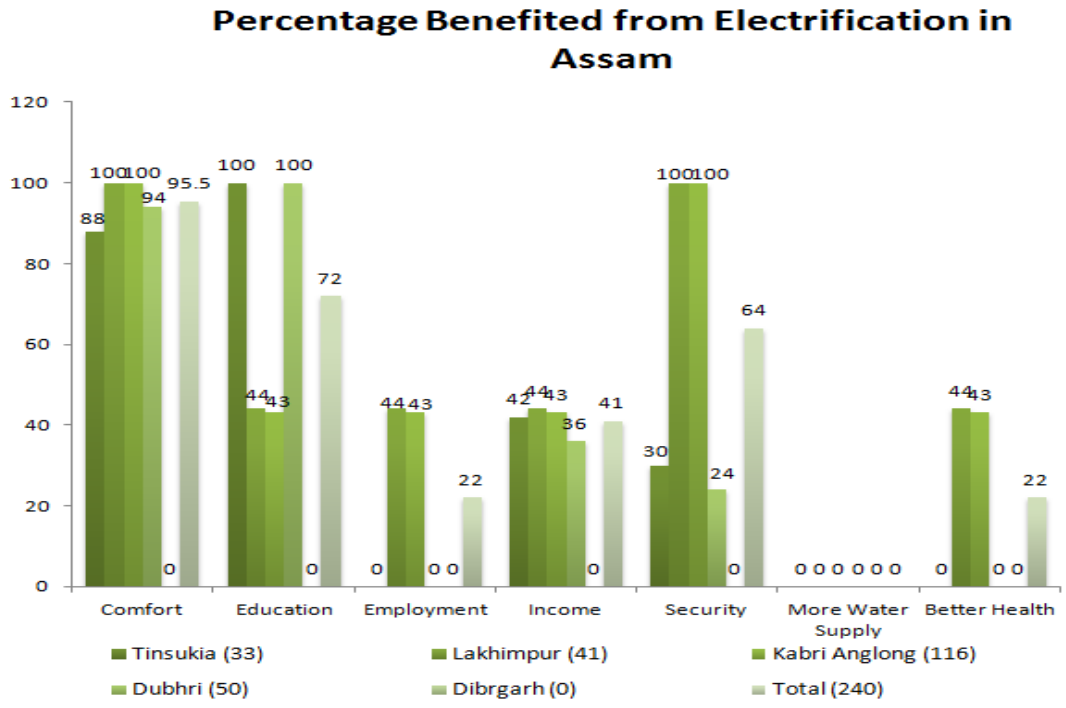


Figure 8 c: Socio-economic benefits from RGGVY

RGGVY programme has benefitted the consumers. 100% consumers indicated that the scheme has increased comfort by multiplying use of electrical appliances for comfort. Participation of youth in education has improved. In Tinsukia, Dibrugarh, and Lakhimpur consumers mentioned that there is improvement in health services. These are the areas where there are tea gardens. Water supply in the Villages is poor, and has not improved. Though there was no visible increase in economic activities, some consumers responded that the income and employment opportunities were available. Sense of Security has improved due to lights in evening hours. Though their main complaint was that availability of power in evening time; was only for one to two hours.

Chapter 6:

Long term Village Electrification initiatives

According to the central government guidelines the Assam state electricity board, undertook the strengthening of the electricity distribution system network. The primary aim of the task was to enhance efficiency of the network so as to reduce transmission and distribution losses. Subsequently, the task was undertaken by the DISCOMs. They have been able to accomplish 98.9% of their planned target. Table 10 highlights the summary of tasks fulfilled by the DISCOMs as of yet.

Table 10: Physical Target Achievement of APDRP[8]

Sl No.	Description	Target	Achievement	% Achievement
1	New 33/11KV S/S (numbers)	52	52	100
2	R&M of S/S	102	101	99
3	Construction of 33KV new line (CKM)	540	540	100
4	Construction of 11KV new line (CKM)	957	894	93
5	Construction of LT new line (CKM)	422	389	92
6	Revamping of 33KV line(CKM)	179	165	92
7	Revamping of 11KV line	1598	1580	99
8	Revamping of LT line	3328	3234	97
9	Installation of new DTR	1873	1849	99
10	R&M of DTR	11338	9893	87
11	Computerized of Billing (S/D)	211	203	96
12	Consumer metering (numbers)	165928	161730	97

The Government of Assam through the efforts of APDCL has been able to maintain compliances in the infrastructure development of Transmission and distribution by implementing APDRP. They have taken loan from ADB to augment the distribution network. Table 10 indicates the 33KV/11 KV network development. The 132/ 33KV substations are also being upgraded. The only issues which were identified while analysing the backward linkages provisions was the inadequate capacity of the village level distribution transformer and the laying of 11 KV line through the forest. Provision of laying under-ground cables can be looked into.

[8] As a part of backward linkages the information was collected from DISCOMs

Tables 14, 15 and 16 provide the brief of the proposed REDB works in LAEDCL, CAEDCL, and UAEDCL; that will facilitate electrification under the RGGVY programme. The Implementing Agency is ASEB, and the ASEB has delegated part of its task to CPSU (PGCIL). The APDCL has taken proactive initiative of backward linkages of RGGVY infrastructure to main-line grid. At the time of survey it may not be possible to evaluate the capacity of substation providing power supply to rural and urban. APDCL is being supported by AEGCL (Assam Electricity Grid Corporation Limited) in backward linkages by taking capacity scalability of transmission line. Present Development activities of AEGCL are mentioned in Annexure 7. The total task is progressing in coordination.

Table 14: Proposed REDB Works in LAEDCL under RGGVY *(Implementing Agency ASEB)*

Sl No	District	Capacity of 33/11 KV Sub-Station	Proposed Site	Length of 33KV incoming Line (km)	Length of 11KV outgoing line (Km)
1	Kamrup	1×2.5 MVA	At "Chamaria" in Chamaria Block	23	11.5
		1×2.5 MVA	At 'Bongaon ' in Bamunigaon Block	1.00	11.00
2	Darrang	1×2.5 MVA	At Barangajuli in Bhergaon Block	18.00	15.00
3	Goalpara	1×2.5 MVA	At Simlabari in Joleswar Block	23.00	Nil
		1×2.5 MVA	At 'Chutki' in Kharmuja Block	20.00	Nil
4	Barpeta	1×2.5 MVA	At Sarthebarai in Sarukhetri Block	25.00	Nil
5	Nalbari	1×2.5 MVA	At Masalpur in Baska Block	27.00	Nil
		1×2.5 MVA	At Kamarkucjhi in Barbhag Block	25.00	Nil
6	Dhubri	1×2.5 MVA	At Panbari in Mahamaya Block	5.00	11.00
		1×2.5 MVA	At Jhowdanga in Mankachar Block	20.00	7.00

(Implementing Agency PGCIL)

7	Kokrajhar	1×2.5 MVA	At Kachugaon in Kachugaon Block	15.00	20.00
		1×2.5 MVA	At Hatidhura in Hatidhura Block	15.00	20.00

Table 15: Proposed REDB works in CAEDCL under RGGVY *(Implementing Agency ASEB)*

Sl No.	District	Capacity of 33/11 KV Sub-Station	Proposed Site	Length of 33KV incoming Line (km)	Length of 11KV outgoing line (Km)
1	Nagaon	1×2.5 MVA	At "Ambagan" in Chamuguri Block	15.00	10.5
		1×2.5 MVA	At 'Juria ' in Rupahi Block	14.00	11.00
		1×2.5 MVA	At Batadrava in Dhing Block	19.00	11.00
		1×2.5 MVA	At Barhampur in Nagaon Block	14.00	9.5
2	Karbi Anglong	1×2.5 MVA	At Umpani in Amri Block	30.00	12.00
			At Bokolia In Longsompai block	18.00	15.00

(Implementing Agency PGCIL)

3	Cachar	1×5 MVA	At Baskabdi in Baskandi Block	15.00	20.00
		1×5 MVA	At Borkhola in Borkhola Block	158.00	20.00
		1×5 MVA	At 'Sonai' in Sonai Block	15.00	20.00
4	Hailakandi	1×5 MVA	At Monipur in South Hailakandi Block	18.00	20.00
5	Karimganj	1×5 MVA	At Nilambajar in Nilambajar Block	15.00	20.00

Table 16: Proposed REDB works in UAEDCL under RGGVY *(Implementing Agency ASEB)*

Sl No.	District	Capacity of 33/11 KV Sub-Station	Proposed Site	Length of 33KV incoming Line (km)	Length of 11KV outgoing line (Km)
1	Jorhat	1×3.15 MVA	At "Phulani" in Ujani Majuli Block	16.12	11.5
2	Golaght	1×2.5 MVA	At Kasomari in Gomariguri Block	22.00	12.5
		1×3.15MVA	At Rongiliting in North Block	3.00	12.00
3	Sivsagar	1×5 MVA	At Mahmora Banfera in Mahmara Block	20.00	20.00
4	Dibrugarh	2×5 MVA	At Rajgarh in Moran Block	20.00	20.00
5	Tinsukia	2×2.5 MVA	At Chapakhua in Sadia Civil Block	30.00	8.4
6	Lakhimpur	1×2.5 MVA	At Raidingia in Ghilamara Block	16.00	6.4
7	Dhemaji	1×2.5 MVA	At Juli Chariali in Machkhowa Block	3.00	12.00
	(Implementing Agency PGCIL)				
8	Sivsagar	1×5 MVA	At Mahmora in Mahmara Block	20.00	20.00
9	Dibrugarh	2×5 MVA	At Moran in Moran Block	20.00	20.00

REFORMED MEASURES TAKEN BY APDCL (ASSAM) UNDER R-APDRP

A total of 67 towns of Assam have been selected by the Power Finance Corporation (Nodal Agency) to take up following works as per the R-APDRP task in a separate programme, which will sustain development and facilitate implementation of RGGVY programme. The project is designed to re-engineer the distribution network, monitor and control the system using incorporated IT facilities. The project will be implemented in two parts, as described below.

Part-A:

- Consumer Indexing.
- GIS mapping, Asset mapping of the distribution network.
- Automatic meter reading, DT and feeders.

- Metering of DT and feeders.
- Feeders segregation /ring fencing
- IT application redressel of consumers grievances, integrated meter reading billing and collection.
- Energy audit and accounting.
- SCADA system in big town and cities (population over 4 lakh and annual input energy 350mu)
- Establishment of the bare line data system.

Part-B:

- Renovation, modernization and strengthening of 11KV line substation transformer.
- Re-conducting of lines at 11KV level and below.
- Load bifurcation /Load balancing.
- HVDS (11KV)
- Strengthening at 33/66KV levels.
- Installation of capacitor banks and mobile centre.
- Arial bunched conductor in populated area.
- Replacement of electromagnetic energy meter with temper proof electronic meter.

Supervisory Control and Data Acquisition (SCADA) in APDCL:

Only Guwahati city is qualified for SCADA in APDCL. APDCL has selected 5 more towns to reform using SCADA system as per guidelines of R-APDRP from its own resources. The R-APDRP system should be extended in phases for RGGVY infrastructure. This will facilitate in evaluating actual losses in village infrastructure

CAPACITY ENHANCEMENT PROGRAMME BY APDRP IN ASEB (APDCL)

The APDRP programme had been carried out successfully in ASEB and the achievement record is **98.90%.**

- After the APDRP programme total capacity added by installation of the **52** numbers of 33/11 KV sub-station is **257.26** KVA.
- Capacity augmentation by R&M work of **102** no S/S is **165.52** KVA.
- Capacity up-gradation by **1854** no New DTRs is **181633** KVA.

Observation interaction with the AGM (REM)/APDCL

APDCL has appointed an AGM (REM) in each district to monitor and provided enabling services to the turnkey contractors. In the surveyed district his support staff were not observed. Their observations in brief is as follows

1) The government of Assam entrusted the power for issuing approval of charging 11KV line and DTR (only for RGGVY works) to the Senior Manager (Electrical) presently "AGM" posted at DIB Electrical circles as rural electrification works.
2) The AGM (Rural Electrification Monitoring) responsibility includes progress monitoring/ quality of work being executed/ spot inspection/ verification of the BPL connection / handing over and taking over and other related tasks of the entire works of the RGGVY. It is essential that the task be performed by responsible rank of executive ASEB. As operation and maintenance works of all the electrified villages of RGGVY after being handed over by PGCIL/ Subcontractor is overlooked by ASEB. The statistics of hand-over and takeover of en-electrified/ de-electrified/ partially electrified villages are indicated in Annexure 6.
3) Groups of almost 25 to 30 men have been engaged by the IPPL (PGCIL contracting firms) for works; it is sometimes observed that hired workers are not up to the mark;
4) AGM (Rural Electrification Monitoring) the implementation of work faces problem due to the following reasons:
    a) Lack of proper vigilance of the works at the site and follow up of safety norms
    b) Unskilled labourer working at the sites
    c) Lack of proper manpower having appropriate skill of the contractor
    d) Site conditions and access to the site, and capacity to handle site condition are challenging due to dense forest, and social insurgency
    e) Lack of cooperation between the villagers and contractors etc.
    f) AGM (RE monitoring) of APDCL has to visit every village of RGGVY who is the only person from the APDCL side, for monitoring the works and

approving the charging. Also DTRs (10KVA, 16KVA, 25 KVA) are to be approved by him.

g) Test reports for 11KV line and DTR have been submitted to the AGM (RE monitoring) regularly through PGCIL. But in actual practice works are not found as per test reports for this reason the progress is slow. In some cases AGM has to visit number of times in single village for issuing charging approval.

h) Theft of DTR is also another factor. Almost 20 DTRs erected at different villages of RGGVY, Dibrugarh have been stolen by miscreants. FIRs have been lodged by the contracting firms at different police stations regularly. The issue has been discussed at the district development committee meeting in the conference hall of Deputy Commissioner and also the Superintendent of Police.

i) The sub contractor working at the site sometimes reports non availability of materials at stores of contracting firms for which work cannot be completed on schedule. Conditions of all the routes to the villages are not proper and in the rainy season, vehicles cannot be used up to the site. Rather, in some cases, for inspection, the person concerned has to walk several kilometres. In some cases there is no route up to the DTR and the waiting period persists till the end of the rainy season.

j) Jungles/ bamboos also stand against the progress of the RGGVY works. As the villages are almost full of trees and bamboos it creates problems for the quality of the 11 KV line.

k) In BPL service connections some problems have appeared. As LOA, the maximum distance of the BPL beneficiary from pole is 30 metres. But as the houses of beneficiaries in some cases are found to be more than 30 metres, those BPL beneficiaries are not getting electricity facility as in the present scope. The contracting firm cannot provide extra 1 or 2 poles for those beneficiaries as this is beyond their scope of work.

l) The procurement process of materials e.g. DTR, line materials, hardware conductors etc. take sufficient time after testing at manufactures. Work and

timely arrival of this material at site and carriage to the actual size /field, which becomes a challenging job.

m) Franchisee: For giving the RGGVY transformer to the franchisee, a minor modification of the LT distribution board of the DTR substation has to be made as the energy meter box of the DTR box cannot be seen if the box is sealed from outside. The modified LTDB drawing has been sent to headquarters already, for approval so that the LTDB of RGGVY already erected can be replaced by new one for franchisee development.

Chapter 7

Decentralized Distribution Generation (DDGs)

The state has not submitted any DPR for the DDG scheme, and their nodal agency for renewable energy has not prepared any DPR that can be put up for sanction under RGGVY. The state is rich in biomass, and has micro-hydel potential. The state has under taken many RVE programme under RVE scheme, that are listed in Annexure 1. Assam has undertaken the following projects for non-fossil fuel energy and power generation; these are

A. **Champamati:** This small hydro plant **(3×133) = 4MW** was commissioned on 01/01/2010 and is running satisfactorily. It was developed by a private firm- ECI Ltd. on boot basis and in a PPA with APDCL, in agreement with Bodoland Infrastructure development company (BIDC). This project was completed under the total supervision of M/S ELFS. The tariff rate is 3.19/unit. The company has to operate the plant up to 35 years before handing over.

B. The following projects are under construction as joint venture of the Government of Assam and ELFS or PPP mode.

a) **Pahumara:** (2×1) 2MW. Expected commissioning date March, 2013.
Tariff 2.911/Unit

b) **Bardokarai**: 4.7 MW. Expected commissioning date March, 2013.
Tariff 2.70/Unit

c) **Desang:** (3×3) = 9MW. Work allotted and started, progress hampered due to forest clearance.
Tariff 2.82/Unit

d) **Kalanga I & II**: (3×2) = 6MW. Work allotted and started,
Tariff 2.98/Unit

e) **Dronpara**: 1.6 MW. DPR Completed. Bidding stage arrived.

All this progress on BOOT basis and PPA are signed with APDCL.

C. APGCL Assam had agreed to handover the following projects to M/S IL &FS for its revival.

a) **Bordikharu:** 2MW. This was the first mini hydro plant of ASEB, during the 1980s, but could not be made operative due to technical snags. APGCL has made arrangements to completely handover this project to M/S IL &FS for revival along with the assets and for new construction.

b) **Dansri:** 20 MW. The same technical snags held up this project; however the Government of Assam allotted this for retention of water. The matter is pending with the Ministry.

c) **Upper Borapani:** 90 MW. In process to be handed over to EL & FS.

D. On-going Hydro project of APGCL :

a) Lungit , 6MW (under construction)

b) Mytarang. 9MW (EPC contract)

c) Amring ,20 MW (EPC contract)

d) Lower Kopili : 150 MW (EPC contract)

E. <u>Initiative taken by APDCL /APGCL in compliance with concept of decentralized distributed generation:</u>

APDCL and APGCL have already selected 2 mini hydro plants at the following locations for as DDG to electrifiy nearby villages in Karbi Anglong district.

- Horn Nala: 300 KW.
- Longsomepi: 100KW.

- Whether DDGs operationalized in state: isolated or grid connected.
- Present form of DDG scheme.
- Proposed modification in DDG scheme.
- Physical Progress Report Of Implementation of RVE programme through Solar

F. Table 17 highlights the Solar Photo Voltaic Home Lighting (HLS) & Solar Photo Street lighting (SLS) in the State of Assam State Electricity Board as on 31.08.2011. Projects initiated in 2007-2008 and after is still in progress

Table 17: Photo Voltaic Home Lighting (HLS) & Solar Photo Street lighting (SLS) in the State of Assam State Electricity Board as on 31.08.2011

Sl No.	Sanction phases	Nos of Sanction Villages	Nos, of Villeges, installation	Physical Prograss				Remarks
				HLS		SLS		
				As per Sanction (Numbers)	System Installed (Numbers)	As per Sanction (Numbers)	System Installed (Numbers)	
1	1st Phase (2005-06)	16	16	1963	1963	Nil	Nil	Project has already been closed
2	2nd Phase (2006-07)	141	141	8682	8682	366	366	Completion report for 104villages submitted to MNRE, remaining villages as per DC, certificate some systems are missing & a high court case is pending.
3	3rd Phase (2007-08)	203	203	8753	8753	146	146	Project completed & completion report submitted to MNRE.
4	4th Phase (2007-08)	55	55	2762	2762	20	20	Project completed and completion report for 54 villages submitted to MNRE.
5	5th Phase (2007-08)	105	102	5960	5327	Nil	Nil	102 villages completed, completion report for 100villages submitted to MNRE
6	6th Phase (2007-08)	287	279	9676	9392	Nil	Nil	279 villages completed, completion report for 273 villages submitted to MNRE.
7	7th Phase (2007-08)	134	111	6073	4957	Nil	Nil	Work in Progress
8	8th Phase (2008-09	110	33	3978	1180	252	83	Work in Progress
9	9th Phase (2009-10)	61	45	13050	6467	Nil	Nil	Work in Progress
	Total	**1112**	**985**	**60897**	**49483**	**784**	**608**	

APGCL'S INITIATIVE FOR SMALL HYDRO DEVELOPMENT IN ASSAM

Assam has Hydro- Power potential of the order of 541 MW against which 2.00 MW has been harnessed so far from the Bardikharu Small Hydro Project (that became inoperative

since April'99 due to technical snags). The GoA has decided to encourage generation of Power through small Hydro (SHP) sources of energy and has framed a policy, so that development of their sector serves as an engine to achieve the objective of promoting all round development of the region by inducting private participation." [9]

The SHP may be envisaged as decentralized distributed generation (DDG) in the state. Figures from the Ministry of New and Renewable Energy source the total capacity of small hydro potential in Assam with 238.69 MW.[10]

The DDG guidelines (No.44/1/2007-RE) have been issued by the Government of India, Ministry of Power. They have specified the expected capital costs that are indicated in the table below. The table also shows the costs of generation as reported in "Indian Renewable Energy Status Report, Background report for DIREC 2010". The estimated cost of power in various SHP is within the one rupee range of tariff for JeebanDhara consumers. The SHP in Assam can be covered within the viable gap funding. With appropriate Biomass technology viable gap funding can be justified for Biomass gasifier, provided continuous operation of Biomass gasifier is ensured.

Table 18: Capital Costs and Electricity Generation Costs by Energy Sources

Energy Type	Capital Cost (Rs/ KWh) [11]	Electricity Generation Cost in INR/ KWh [12] [13]	
Biomass gasifier	~78000	2.25	4 to 5
SPV	~300000	14.5	8 to 15
Solar (CSP)			10 to 15
Biogas DG Set	~85000	0.75	
Biofuels DG Set	~20000	10.75	

[9] Alternate Hydro Energy Centre, IIT Roorkee: Government of Assam – Policy for Small Hydropower Development, Assam State Electricity Board, Guwahati; March 2007; page 4; www.ireda.gov.in/Compendium/Data/Assam/SHP.pdf; Accessed December 2011

[10] Ministry of New and Renewable Energy: Annual Report 2010-11; Chapter 5.31; http://mnre.gov.in/annualreport/2010_11_English/Chapter%205/chapter%205.htm ; Accessed December 2011

[11] Government of India; Ministry of Power; No.44/1/2007-RE; Guidelines for Village Electrification through DDG under RGGVY in the XI Plan – Scheme of Rural Electricity Infrastructure and Household Electrification; Annexure 3: Framework for ranking various renewable energy based DDG options; www.powermin.nic.in%2Fwhats_new%2Fpdf%2FGuidelines_for_Village_Electrification_DDG_under_RGGVY.pdf; Accessed December 2011

[12] ibid.

[13] NREL, REN21, gtz, IRADe, Bridge to India: Indian Renewable Energy Status Report – Background Report for DIREC 2010"; NREL/TP-6A20-48948; October 2010; page 19; http://irade.org/Indian%20Renewable%20Energy%20Status%20Report.pdf ; Accessed December 2011

Micro-hydel	~60000	0.25	
Small Hydro			3 to 4
Wind			3-4.5

Chapter 8

Franchise Models in Operation

Various types of Franchisee are in operation in Assam.

Input Based Distribution Franchisee (IBDF):

Input Based Distribution Franchisee (IBDF) is the scheme designed by the APDCL, in which LT consumers of the 11KV rural feeders are handed over to the suitable and competent franchisee. In the scheme, the franchisee is built on a predetermined rate known as Bulk Supply Tariff (BST) which is calculated on the basis of pre prevalent commercial parameters of the area. The factors which affect the BST are the T&D losses, collection efficiency, AT&C losses and the condition of the network of the feeder. In this scheme only LT consumers of the feeder will be handed over the franchisee. The HT consumers and the Government LT consumers will be billed by APDCL. The franchisee will buy electricity from the utility measured through the meters, installed at input points of 11KV feeder, at BST rate and shall sell to the LT consumers in its area at normal tariff rate of the utility.

Implementation of IBDF scheme in APDCL:

Due to the introduction of RGGVY scheme for rural electricity infrastructure and household electrification, approximately 10 lakh BPL consumers of Jeevan Dhara category will be connected to the APDCL grid. This will lead to a jump in the electricity consumption in the rural areas, and increase in the networks which may not be possible to manage due to the increased volume of billing, realization and maintenance activities and may be a cause of concern to the APDCL. Unless the recovery from the rural consumptions is improved, the financial position of the APDCL will rapidly deteriorate. To handle such a huge consumer base and to maintain efficient billing and collection system, it was proposed to hand over the DTRs installed under RGGVY scheme to the franchisee under present SPPS scheme. But the existing scheme will not be able to manage such huge consumer base and the increased electricity consumption in the rural areas. Under these circumstances, it was decided to hand over the 11KV rural feeders to franchisees for better and efficient electricity management in the rural areas and as such a new scheme in the name of IBDF scheme was designed.

Objective of the Scheme

The IBDF scheme was designed to achieve the following targets in the rural areas:

- Reduction in T&D losses and the AT&C losses.
- Improvement in consumers service quality
- Improvement in metering , billing and collection efficiency

Scope of work of the franchisee

The franchisee shall be responsible for:

1. Meter reading, bill generation, bill distribution, revenue collection of the consumers under their control.
2. Day to day minor repair and maintenance services.
3. Operationalising new service connections by interacting with block level executive engineer.
4. Carry out disconnections/reconnections as per situation.
5. Regularization of illegal consumers and mitigate theft.
6. Detailed survey of consumers, consumer indexing and alignment of consumers.
7. Collections of the principal amount of the total accumulated arrear of APDCL from the consumers who are covered under the IBDF scheme.
8. Service for minor LT and HT maintenance activities.
9. Security of the distribution assets in their area of operation.
10. Assisting the APDCL in finalization the Asset register updating the consumer related MIS in the franchisee handed over area.

Contract Duration

Project area shall be taken over by franchisee within two months of issuance of LOI and the date of commandment of the operation shall be the starting date. The agreement shall be valid for a period of 5 years, with effect from the starting date unless terminated earlier or as per the terms and conditions of the agreement. The duration of the agreement can be extended on mutually agreed terms and conditions. The extension process shall be initiated formally in writing one month prior to the expiry of the agreement. If any major discrepancy in the application documents furnished by the franchisee is found out during the contract period, then it may result to termination of the contract.

Security Deposit

Franchisee shall have to deposit 2 times of the monthly assessed revenue as per average potential demand for last one year. APDCL shall ensure return of the security deposit to the franchisee within 60 days of termination of the contract after the settlement of APDCL accounts.

Incentive

- In the scheme the franchisee is billed on a predetermined rate known as Bulk Supply Tariff (BST), which is calculated on the basis of pre prevalent commercial parameters of the area. The factors which affect this BST are the T&D losses, AT&C losses, condition of the network of the feeder. As franchisee puts in efforts towards reduction of losses prevention thefts, improvement of distribution networking system of the feeder. It results in an increase in per unit realization by the franchisee and the difference between this per unit realizations and per unit BST is the incentive of the franchisee.
- The franchisee has to deposit a security deposit- an amount which equals to 2 times of the monthly assessed revenue as per the average potential demand for the last 1 year before talking over the feeder.
- An amount of Rs 1, 45, 00,000 is to be invested by the franchisee for starting the business and other investments such as purchase of computers, office stationeries, office furniture etc.
- For both the cases, an interest of 25% is given to the franchisee as a return of the investment which is reflected in the collection of BST of the feeder

Benefits

- The franchisee will earn 15% for collecting the arrear mounted during APDCL's operations.
- Any amount collected by the franchisee for the consumers on account of disconnections and reconnection charges shall be retained by the franchisee.

- Application for new servicer connection shall be received by the franchisee, which will also prepare a feasibility report and estimates for new service connections. Franchisee shall be paid Rs. 550 per connection for the same.

Selection of franchisee

First Stage: At the first stage, franchisees were selected on the nomination basis.

Second stage: At the second stage franchisee agreement was revised and the franchisee was selected through the paper modification and subsequently performance evaluation and the management interaction by the selection committee.

The following two tables are showing the circle wise status of the IBDF and the SPPS scheme.

Table 19: Circle wise status of 11 KV feeders of IBDF scheme

Name of the circles	Numbers of feeder selected	Agreement signed with the franchisee	MOU signed/LOI issued to the franchisee	Under Processing
GEC –II	7		2	5
Rangia	7		3	4
Bongaigaon	24	4	12	8
Kokrajhar	2		2	
Mangaldoi	5	3		2
Cachar	9		3	6
Nagaon	5			5
Dibrugarh	3		3	
Jorhat	4			4
Sivsagar	5		3	2
Tezpur	3			3
Tinsukia	3	2	1	
N.Lakhimpur	1		1	
TOTAL	78	9	30	39

Further updated data is indicated in Annexure 9

Table: 20 Up to date Circle wise Status of the SPPS Scheme as on 31.07.2011

Sl. NO.	Name of the circle	No of DTR handed over	No. of agents	No. of Village covered	No. of manpower engaged by the agents	No of consumer handed over to the agents
	Cachar	454	245	444	565	20692
	KANCH	68	17	68	58	4824
	Nagaon	450	141	481	659	28207
	Tezpur	27	17	30	70	1868
Central Assam Zone		**999**	**420**	**1023**	**1352**	**55591**
	GEC- I	36	8	42	49	3347
	GEC- II	164	34	163	254	17031
	Rangia	158	46	144	234	16701
	Bongaigaon	280	46	280	309	14990
	Kokrajahar	354	57	211	197	16738
	Mangaldoi	135	49	145	145	4717
Lower Assam Zone		**1127**	**240**	**985**	**1188**	**73164**
	Dibrugarh	**345**	**39**	**345**	**22**	**14282**
	Jorhat	**163**	**62**	**163**	**329**	**8927**
	Sivsagar	**161**	**27**	**166**	**146**	**7639**
	Tinsukia	**171**	**36**	**171**	**77**	**77583**
	N.Lakhimpur	**273**	**149**	**304**	**292**	**10878**
Upper Assam Zone		**1113**	**313**	**1143**	**1071**	**49479**
APDCL		**3239**	**973**	**3157**	**3611**	**178234**

Figure 9: Percentage of Bills issued in Assam

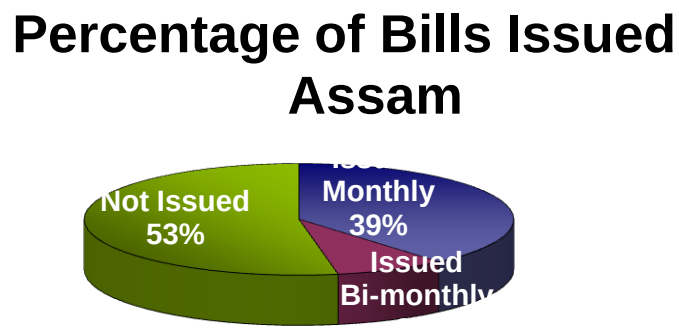


Figure 10, describes the percentage of houses that were billed for electricity consumption in surveyed villages in Assam and in-accordence to what schedule. More than half of the households receiving electricity were not being billed. Of the 47% households that were receiving bills, a majority (39%) of them received them each month, while 8% had their bills dispatched bi-monthly. It was found that in a single district only one format of billing was adhered to, either monthly or bi-monthly. Also, there were 100% recoveries of the bill amounts as all the bills issued were paid. In the surveyed villages, the paying capacity of the people interacted with was estimated. Correlation between paying capacity and non payment of bills could not be established.

Table 21: Indication of the average paying capacity of the consumers.

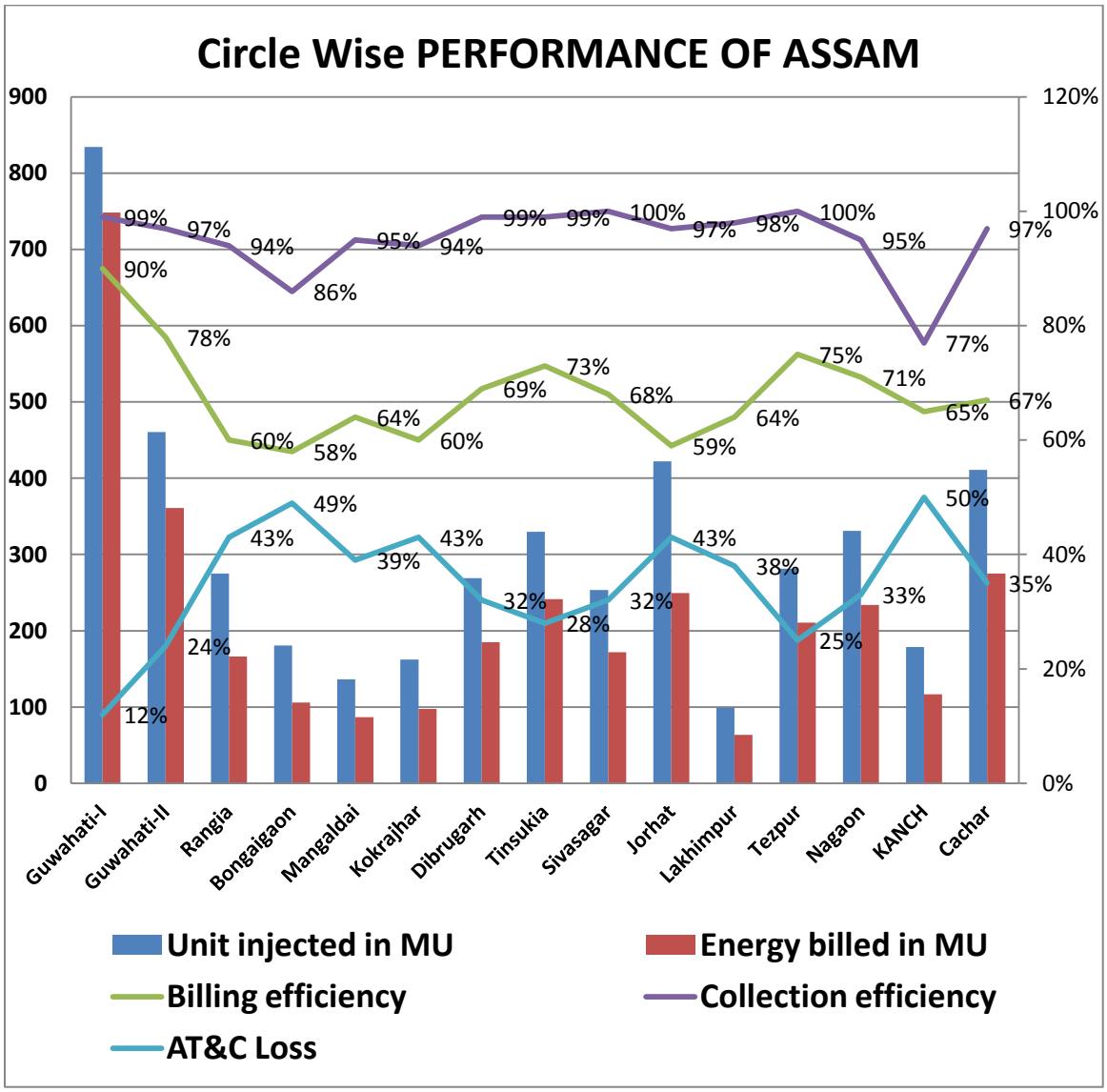
Household Monthly income in Rupees			
	Max	Min	Average
Lakhimpur	10000	1500	4560
Karbi Anglong	3500	1000	2594
Tinsukia	1800	1000	1315
Dhubri	3000	1000	1586
Dibrugarh	NA	NA	NA

Chapter 9

Performance of Distribution Utilities and Rural Consumers

Performance of the DISCOM is greatly impacts the success of RGGVY. In Assam performance is evaluated according to the circle of operation. The performance of DISCOM based on the newly electrified villages will not be correct picture of DISCOM efficiency. The Data available on the web is used to evaluate the performance in the circle level.

Figure 10: the circle wise performance of Assam[14]



[14] Website of Assam State Electricity Board

We observe from the figure 10; that in the districts of Guwahati- I and II the highest units of Electricity were injected. Moreover, the billing efficiency in these districts was also high at 90% and 78% respectively. In Kanch, the highest AT&C losses were reported i.e 50%, while the lowest were in Tezpur (25%). The lowest reported figures for Billing Efficiency were in Bongaigaon (58%) and Borhat (59%) circles. This figure also depicts the reported Collection efficiency, which is highest at 100% in both, Sivasagar and Tezpur circles.

The category wise consumers, their connected load and total defective meter are collected for the month of June, 11 which can be seen at Table-21A

Table 21A: Category Wise Revenue Report for the Month of June'11

Sl No.	Category	Connected Load (KW)	Total Numbers of consumer	Total Defective meters	% defective meters
	LT CATEGORY				
1	Jeevan Dhara	71200	280341	10540	3.8
2	Domestic A	1306818	1286953	114431	8.9
3	Domestic B	168593	24271	2011	8.3
4	Commercial	291528	165794	9868	6.0
5	General Purpose	59104	25973	4118	15.9
6	Public lighting	4372	866	114	13.2
7	Agriculture	10289	4868	615	12.6
8	Small Industries (Rural)	77159	7121	494	6.9
9	Small Industries (Urban)	37925	3669	136	3.7
10	Temporary supply (Dom)	148	62	0	0.0
11	Temporary Supply (Non-Dom)	618	263	0	0.0
12	Rural unmetered (Dom)	8110	9865	0	0.0
13	Rural Metered (Comm)	186	225	0	0.0
14	Deptt. Employees	7896	5625	644	11.4
15	Board Establishments	1771	540	68	12.6

	HT CATEGORY				
16	Domestic	43247	601	3	0.5
17	Commercial	143384	1881	15	0.8
18	Public water supply	29976	2414	539	22.3
19	Bulk Supply (Govt. Education)	28451	207	12	5.8
20	Bulk Supply (Others)	158273	829	38	4.6
21	HT- Small Industries	24189	767	17	2.2
22	HT-I Industries	53205	735	3	0.4
23	HT-II Industries	302046	200	1	0.5
24	Tea,Cofee and rubber	311639	982	21	2.1
25	Oil and Coal	36417	119	13	10.9
26	HT Irrigation	49441	959	210	21.9
27	Single Point Supply	145545	193111	6334	3.3
28	Boards Establishment	31	4	4	100.0
TOTAL		**3371561**	**2019545**	**150245**	7.4

The tariff order of ASEB does not indicate the cumulative subsidy component in the rural and agriculture sector. This may be due to non availability of meters at the rural consumers end. Tentatively variation in average tariff and average cost of supply may be taken as indicative subsidy.

Table 21 B Tariffs in Rs. per KW in the state of Assam in Rural Sector[15].

Tariff in Rs. Per KW				
Sl No	Type of Consumers	Average Tariff	Average cost of Supply	Variation that can taken as subsidy
1	Jeevandhara up to specified units	3.25	4.98	(-)1.73
2	Domestic A above 0.5 Kw Load to 5 KW load			
	First 4kWh/day	3.75	4.98	(-)1.23
	Next 4kWh/day	4.8	4.98	(-)0.18
	Agriculture up to 7.5 HP Pump	3.26	4.98	(-)1.72
	Small industries rural upto 20 KW	3.33	4.98	(-)1.65

[15] Tariff Order of Assam State Electricity Regulatory Commission

Table 21C Actual and Projected Information on Jeeban Dhara Connection vide Tariff order of ASEB

Actual and Projected Information on Jeeban Dhara Connection vide Tariff order of ASEB					
ITEM	2008-09	2009-10	2010-11	2011-12	2012-13
of Connection	70688	112221	500423	1000844	1050888
Sales (MU)	34	39	230	460	483
Additional Connection to be Given		41533	388202	500421	50044
Additional Sales Projected (MU)		5	191	230	23
Average Sales per connection / month (KWh)	40	29	38.3	38.3	38.3

APDCL has projected the energy sales for the agricultural category of 7.5 HP for the control period is reflected in Tariff Order of ASEB. The information provided in Table 21 B, 21C, 21D reflects the subsidy burden on the DISCOMs

Table 21D Agriculture Sector up to 7.5 HP consumers.

Year	Energy Sale
2010-11	12 MU
2011-12	21 MU
2012-13	42 MU

The Performance APDCL can be seen at Table 22.

Table –22: Performance Of APDCL for the month of August'11

Sl No.	Name of Circle	Unit Injected in MU	Energy bill in MU	Billing efficiency %	Collection Efficiency %	Overall Efficiency %	AT&C %	Percentage of Billing %	Total No. of Consumers
1	Guwahati-I	89.11	78.23	88	97	85	15	96	169701
2	Guwahati II	47.46	35.18	74	93	69	31	91	112711
3	Rangia	34.90	22.17	64	93	59	41	94	259358
4	Bongaigaon	20.99	12.16	58	86	50	50	82	127878
5	Mangaldai	14.44	9.01	62	93	57	43	89	85924
6	Kokrajhar	17.45	9.92	57	85	48	52	94	91815

Lower Assam Total		**224.35**	**166.67**	**74**	**94**	**70**	**30**	**92**	**847387**
7	Dibrudagarh	27.61	20	72	99	72	28	97	71983
8	TINSUKIA	35.72	26.82	75	86	72	28	97	114676
9	Sibsagar	27.01	18.73	69	95	66	34	96	110580
10	Jorhat	42.79	27.65	65	91	59	41	85	196847
Upper Assam Total		**133.13**	**93.20**	**70**	**95**	**67**	**33**	**90**	**494086**
11	Tezpur	29.21	22.28	76	97	74	26	94	118429
12	Nagaon	38.44	26.95	70	102	72	28	92	263997
13	KANCH	17.55	10.99	63	72	45	55	88	60242
14	Cachar	45.91	30.45	65	97	63	37	90	195425
15	Lakhimpur	11.08	7.14	64	86	55	45	92	95517
Central Assam Total		**142.186**	**97.411**	**69**	**94**	**65**	**35**	**92**	**733610**
DISCOM Total		**499.66**	**357.27**	**72**	**94**	**67**	**33**	**91**	**2075083**

After study of Table 21 & 22 it is seen that,

Total Number of consumers: 2075083

Number of defective meter: 150245

Billing efficiency of APDCL: 72 %

Collection efficiency of APDCL: 94%

Overall Efficiency: 67%

Percentage of Billing: 91%

AT & C loss APDCL: 33%

If 4.8%, the declared T&T loss of 2010-11, is included in this loss, then the total AT &C loss will 33+4.8= 37.8 % which is still on the higher side.

APDCL has got a large number of defective meters, 150245 in number. If APDCL takes immediate action to replace these defective meters then AT& C loss will be substantially reduced. However it is gathered that the purchase procedure for procurement of meters is on hold, due to which replacement of meters is taking more time than required. It is also gathered that during 2007-2008, 2008-2009 and 2009-2010, the AT & C loss calculated

at the APDCL level are 29%, 30% and 31% respectively. It has now increased to 32%. The reason may be summarized below:

1. During the period many villages have been electrified as per RGGVY.
2. These villages, though taken over by existing revenue sub-division, have been observed to have poor revenue collection.
3. Many of the villages are inaccessible due to improper road communication.
4. Shortage of manpower collection of meter reading and dispatch of bill.
5. Theft of energy in this rural feeder.
6. Reluctant attitude of the employee for collection of revenue and other related issues.
7. The rural consumer not pays the bill due to erratic power supply position.

After completion of RGGVY works of all the Districts of Assam the following infrastructure shall be added to the existing distribution networks.

1. 33/11 KV Sub-Station: 32 of them; Power Transformer capacity-121.3 MVA.
2. Total 33 KV line Length : 501 Km
3. Total 11 KV line Length : 24300 Km
4. Total LT line Length : 19974 Km
5. Total New DTR : 21284
6. Total BPL Consumer : 989411

A. Additional Consumer likely to be added:

1. BPL consumers : 989411
2. APL consumers : 109525

Total number consumer likely to be increased – 10989936

(Assuming 5 APL consumers in each of 21905 villages covered under the scheme)

B. Demand of Power likely to be increased:

New DTR Addition,

- 10KVA × 1042 = 10420 KVA

- 16KVA × 15371 = 245936 KVA
- 25KVA × 4871 = 121775 KVA

Total capacity addition = 378131KVA

Assuming 80% capacity utilization (LF) and 60% demand factor at 0.85 power factor, = (78131× 0.8× 0.6× 0.85) KW = 154.3 MW

After addition of 35% T&D loss,

Total Power Requirement likely to be increased by 208.3 MW

(154.3 MW+ T&D loss 54.0 MW)

C. Impact on revenue: As per REC norms, 15-16 hrs in a day power supply must be ensured.

- On an average, to provide power for 15 hours of daily consumption of energy will amount to 2314500 units.
- Monthly consumption of energy will be approximately 69435000 units, say 70 MU.
- Considering average revenue return of rural areas (ARR) as Rs. 2.5 /unit against the cost of purchase of 4.86/unit,
- Total financial support required Rupees 15.13 crores /month (69435000× Rs. 2.18)

D. Manpower Requirement:

- In case of handover of all the prospective consumer (BPL/APL) covered under the scheme to the franchisee, additional financial support of approximately Rs. 3.5 crore /month will be required as commission to the franchisee. Again one time expenditure of approx. Rs. 10 crore will be necessary for renovation of the HT and LT networks, DTR Repairing/Augmentation, DTR metering etc. at the time of handover of the consumers to the franchisee.
- If APDCL cannot handover the additional consumer to the franchisee, manpower requirement for revenue building is as under.
    A. Meter Reader (Out Source) – 1100 (1000 con/MR)
    B. Bill Clark – 550 (2000 con/BC)

C. Financial Support required for payment to MR and BC = Rs. 88 Lakh/ month. (Rs. 3.00 /meter reading, Rs. 5.00/ Bill)

D. Computer, Table and chairs with other office stationeries of Rs. 110 lakh (One computer /5,000 consumer considered)

Chapter 10

Comments, Observations and Recommendations

The RGGVY has been able to Build a good quality infrastructure to sustain electricity supply for the rural Area, under multiple challenges faced by the state. The existing system of the scheme management can be augmented with higher participation of the state government; being perceived as central government scheme. Hence the implementation process may be designed according to the management structure current structure of electricity board (e.g. circle wise, subdivision).

Following are the observation based recommendations of the RGGVY programme and its implementation in Assam. These recommendations are of general nature and are obvious, but have utility value

I. Though the total progress is quite satisfactory consider the natural challenges and political turmoil and insurgency, the following shortcomings are hampering the progress of the work. During the delays analysed, it was observed main delay occurred during erection and commissioning and phased transportation of materials
    - Clearance from the forest authority for drawing HT and LT lines should be streamlined. Within and in the proximity of the villages underground cabling may be thought of though it will incur higher cost.
    - Delay is due to land acquisition for the S/S, and right of way for installation of LT pole in the villages. Proactive action of Panchayat is desired
    - Limited number of good agencies/ contractors and skilled manpower are available locally. The subcontractors rely on the local workmen for work execution. The skilled manpower tends to migrate to better opportunities.
    - Delay in materials receipt at site due to poor condition of road and bridge, and coupled with bad weather. Damage is also caused to village infrastructure such as road/bridges due to natural calamities like flood, erosion. Difficult terrain of hills, small, big rivers without proper communication and road and bridge (load carrying capacity) transport network
    - Delays in material transport are also caused due to fulfillment of formalities with the tax authority to get the road permit and other tax. Material is received from manufacturers located at distant cities.
    - Refund of service tax deducted from Contractors is also an issue.

- Delays in receipt of state government BPL list from the competent authority. This list gets updated frequently. Public grievances are also there
- Inclusion of some villages in RGGVY programme with zero population (may be due to migration because of floods and other calamities)
- In some area, there are grievances among the villages regarding development of quality and quantity of infrastructure.
- Due to insurgency there are the Roads blocks, Bandh calls etc. by the different organization for work stoppage
- Poor population density in villages requires extra length of cable for service connection. There is a reluctance to give connection to distance households as they have to install additional poles
- Labour problem at the site. Uncomfortable, and insecure working atmosphere in the insurgent area where loots/arson/kidnapping takes place frequently
- Political interference during the process of electrification for various reasons.
- Less working months in a year due to frequent rain which may be around six months for the year. This is apart from insurgency issues
- Lack of co-ordination and cooperation of different departments involved in the process. This includes internal department of ASEB, and external institutions such as District administration, Panchayati Raj Institutions. In APDCL, a assistant general manger (RE monitoring) has been instructed to co-ordinate and look after the RE works for RGGVY programme under a particular DISCOM circle, however in certain cases, AGM has to look after more than one district. Due to multipurpose work load it become difficult sometimes for the AGM to coordinate the project smoothly.
- As AGM monitoring has given the authority for approval of charging the line and substations, without adequate support staff. In many cases he has to approve the testing parameters as well as total construction for charging. Sometimes the executives, who are in charge of that particular subdivision, which is responsible to connect the existing infrastructure to the new infrastructure, show

unability due to backward linkage provisions and the total programme is delayed or postponed.

- Shortage of manpower on the DISCOM site, for monitoring as well as charging, is less and due to this progress definitely hampered.

II. During the village survey, it has been noticed that the schools, health centres and community centres are mostly not electrified. The concerned authorities of the government and panchayati raj institution have to allot funds for infrastructure development in these community institutes for electrification. Even if this facility exist it may not be possible to provide services connections due to the overload of the transformer. So, it is suggested that government should provide funds to these institute for service connections and accordingly provision has to be made in the infrastructure to cater to this load.

III. Almost all the villages have poor inhabitants. Starting any SSI found to be difficult. Again, the infrastructure already available may not be sufficient to cater to the load. Therefore sufficient KVA should be ensured during survey, taking in to consideration the level of the village industry.

IV. Many APL consumers are insisting in almost all villages, but the Department couldn't release connections due to the limitations of transformer capacity and VEI.

V. Consumer load growth in rural area will occur rapidly over time, hence overall T&D system needs to be strengthened and improved to cater to the demand. Since the state funds are limited and financial health of Discom is poor, the central government may provide loan to these states government at concessional rates for strengthening the system.

VI. DISCOM should be provided with more manpower for smooth and speedy implementation of the RGGVY work along with the AGM monitoring.

VII. DPRs for further investments need not be District based as in case of Karbi Anglong and Dhubri. Centralised Investments can be made, Distribution Circle wise and these should be made cost and profit centres to improve the accountability and efficiency of investments.

VIII. Rural electrification plans are difficult to become financially sustainable unless these become part of the commercial operations of Distribution Circles combining with urban and rural distribution network.

IX. The theft of electrical energy is in vogue due to the following reasons :

- The APL consumers who are willing to take electricity connection could not be serviced by APDCL, because of the limitation of DTR capacity, inadequate infrastructure installed in the village, scarcity of meter & hardware / conductor etc.
- The left out BPL are those whose names are not listed in the beneficiary list or are not provided connections as per priority list.
- Unscrupulous persons who always indulge in this type of immoral activity.
- Non-vigilant attitude of the department.
- Lack of public awareness on consequence of theft.

APDCL should strictly deal with the issue and try to release service connection where technical parameter exists.

It is understood that many consumers have already paid the required money for a connection. In many cases it is due to shortage of meters, though the consumers have paid for the meter, that the APDCL could not give the connection. So it is suggested that the APDCL should select the brand of meter, so that the consumer can purchase the meter and deposit it with the department which can be connected after testing by the APDCL. Many connections have been given by the APDCL without a meter and that way unmetered connection will enhance the AT&C loss.

APDCL should make awareness programme for the appraisal of the consumers and make a 'Consumer Protection Cell' with Gaon Panchayat & other NGOs to stop the menace of theft of energy.

In order to fulfil the vision of providing “electricity for all” and to ensure revenue sustainability of rural electrification the APL connection to remaining APL consumers may be provided at a discounted rate. This is being practiced in the state of West Bengal. Central government can give certain financial support for release of APL connection, and cost of connection may be shared between state and centre.

Law & order authority should also assist APDCL officers in providing security. Their assistance will enable DISCOM executives to perform O & M of DTR and VEI.

During the 1st phase of RGGVY, the total DTR of different capacities will be 21284. The APDCL normal DTR will be around 30,000 in number. All together there may around 50,000 DTR. As per the record the failure rate of DTR is around 8-10% per year i.e. after the defect liability period is over around 5,000 DTR have to be replaced by APDCL, for which a huge investment has to be incurred by the APDCL from its own O & M fund. The failure of these transformers, which are located in a distant place from the main working headquarters of APDCL, will mean that routine maintenance will not be carried out in an efficient manner. Due to the theft etc. the failure rate will also increase. APDCLs own resources for this will be very low. For a certain period some funds have to be allocated from the central fund for continuity of service. Otherwise the VEI will be damaged.

Manpower

Shortage of manpower will pose a huge challenge. Around 200 MW will be injected to the APDCL network after the completion of RGGVY (1st Phase). There are 32 33/11 KV sub-stations, 500 Km.-33 KV lines, 24,300 Km.-11 KV lines and around 20,000 Km. LT lines will soon be completed. For all this work, the requirement of manpower is huge. How APDCL will look after these infrastructures, is a matter of great concern. This will have an unusual impact on APDCL revenue earning. That is one of the basic reasons for delay in taking over; even after the taking over by the department the involvement of APDCL manpower in the newly electrified village/sub-station will be found to be not up to the mark. The present staff number is also not sufficient to cater to the work demand. The village people/panchayat/NGO have to be involved to this process and they should be encouraged to take part in O & M of the VEI or REDB which some guidance.

Many of the APDCL employees who have got experience in those works can be encouraged to be further involved in the process with some honorariums or contractual amount so that burden of APDCL employee can be reduced.

Other Small Scale Industries etc.

With the small electrical infrastructure in a village, the development of small scale industries will be a problem. There are sufficient gaps in the DTR capacity for the industrial growth. At the time of preparation of DPR, some margin should be kept in the DTR for industrial & commercial growth. Local population and opponents should be encouraged to become entrepreneurs and provided landholdings and mentorship apart from facilitating access to credit, market and technology etc.

For Electrification of Community Centre, Health Centre etc:

For electrification of community centre, health centre, public places, school, market etc. the concerned authority should come forward to take electricity connection and formalities have to be done as per rule. However the Government Department should also come forward to get the electricity connection with some infrastructure development.

Conclusion

People are generally happy as soon as their villages are electrified. The normal life standard has also increased to some extent definitely. But in the long run when their demand of electricity will increase, it will be a difficult task for the APDCL to meet their demand and heavy load shedding will definitely jeopardize public interest. Implementation of RGGVY Programme in Assam has been constrained by a variety of reasons: both natural and manmade. Rapid strides in rural electrification are possible through mainstreaming and effective involvement of local population so that their own welfare is genuinely perceived to be embedded in the development oriented RGGVY/DDG Projects. Innovative business models are possible for this to be achieved, so as to provide wage employment and self-employment for the people of Assam. Capacity building for this purpose requires involvement of sector specific non-profit organisations, having multidisciplinary teams. Equally important is the need to be technically agnostic. The objective of rural electrification can be achieved more cost-effectively through decentralized generation from RE Systems. This calls for effective coordination between MOR and MNRE and State Governments. Private Sector can play a transformational role. Unfortunately RGGVY's rigidity excludes the private sector's involvement. MNRE's off grid scheme offers useful lessons for reconstructing RGGVY and DDG. The results of Phase II of JNNNSM also provide serious food for thought. An in-depth, rigorous study in the nature of cost-benefit/cost-effectiveness analysis of

available technological options is called for urgently to ensure optimal resource allocation in the rural electrification sector.

Annexure 1: Progress Report Of Implementation of RVE programme

Physical Progress Report Of Implementation of RVE programme through Solar Photo Voltaic Home Lighting (HLS) & Solar Photo Street lighting (SLS) in the State of Assam State Electricity Board as on 31.08.2011

Sl No.	Sanction phases	Nos of Sanction Villages	Nos, of Villeges, installation	Physical Prograss				Remarks
				HLS		SLS		
				As per Sanction (Numbers)	System Installed (Numbers)	As per Sanction (Numbers)	System Installed (Numbers)	
1	1st Phase (2005-06)	16	16	1963	1963	Nil	Nil	Project has already been closed
2	2nd Phase (2006-07)	141	141	8682	8682	366	366	Completion report for 104villages submitted to MNRE, remaining villages as per DC, certificate some systems are missing & a high court case is pending.
3	3rd Phase (2007-08)	203	203	8753	8753	146	146	Project completed & completion report submitted to MNRE.
4	4th Phase (2007-08)	55	55	2762	2762	20	20	Project completed & completion report for 54 villages submitted to MNRE.
5	5th Phase (2007-08)	105	102	5960	5327	Nil	Nil	102 villages completed, completion report for 100villages submitted to MNRE

6	6th Phase (2007-08)	287	279	9676	9392	Nil	Nil	279 villages completed, completion report for 273 villages submitted to MNRE.
7	7th Phase (2007-08)	134	111	6073	4957	Nil	Nil	Work in Progress
8	8th Phase (2008-09	110	33	3978	1180	252	83	Work in Progress
9	9th Phase (2009-10)	61	45	13050	6467	Nil	Nil	Work in Progress
	Total	**1112**	**985**	**60897**	**49483**	**784**	**608**	

In a statement in parliament the Honourable Minister of MNRE mentioned that in 2157 cases of RVE will be taken up as and when proposals are received.

Annexure 2 Implementation Schedule Related Information

Sl. No No.			1		2		3
Name of District			Karbi Anglong		Dhubri		Lakhimpur
Implementing Agency			ASEB		ASEB		ASEB
Name of 33/11 KV Sub Station			Umpanai	Bokolia	Mahamaya	Jowadanga (Mancachar)	Raidengia
Capacity of Sub Stations (MVA)			1x2.5	1x2.5	1x2.5	1x2.5	1x2.5
Date of Award			30-01-09		12-Feb-09		02-Mar-09
Scheduled completion date (24 months from the date of award)			30-01-2011		12-02-2011		02-03-2011
Land Acquisition	Identification of Land	Due Date (1st quarter from date of award)	30/04/09		12-May-09		02-Jun-09
		Status	Identif	Identi	Identifie	Identified	Identified

			ied	fied	d		
	Handig Over of Land to Contractor	Due Date (2nd quarter from date of award)	30/07/09		12-Aug-09		02-Sep-09
		Status	Handed over		Handed over	Handed over	Handed Over
Supply of Major Equipment and Material	Placement of orders	Due Date (2nd quarter from date of award)	30/07/2009		12-Aug-09		02-Sep-09
		Status	100%	100%	95%	95%	100%
	Commencement of Supply	Due Date (3rd quarter from date of award)	30-10-09		12-11-09		02-12-09
		Status	100%	100%	90%	90%	100%
	Completion of supply	Due Date (5th quarter from date of award)	30-04-10		12-05-10		02-06-10
		Status	98%	98%	65%	65%	100%
Erection and commissioning	commencement of Civil works	Due Date (3rd quarter from date of award)	30-10-09		12-11-09		02-12-09
		Status	100% completed	100% completed	80% completed	80% completed	100% completed

	Erection and commissioning	Due Date (5th quarter from date of award)	30-04-10		12-05-10		02-06-10
		Status	In progress	In progress	In progress	In progress	Charged on 30.03.11
Remarks							Handed over.

Annexure 3: Fortnightly Progress of installation of Sign Boards under RGGVY; as on 15-10-2011

Sl. No.	Name of the project	Name of Implementing agency	No. of Un-electrified villages covered for electrification	No. of villages where sign boards have been erected	Balance villages where sign boards are yet to be erected
1	*3*	*5*	*6*	*7*	*8*
1	RGGVY-(Tinsukia)	ASEB	350	350	0
2	RGGVY-(Jorhat)	ASEB	243	243	0
3	RGGVY-Goalpara	ASEB	323	323	0
4	RGGVY-Nalbari	ASEB	145	131	14
5	RGGVY-Morigaon	ASEB	257	255	2
6	RGGVY-Golaghat	ASEB	483	421	62
7	RGGVY-Darrang	ASEB	204	200	4
8	RGGVY-Barpeta	ASEB	226	82	144
9	RGGVY-Kamrup	ASEB	379	82	297
10	RGGVY-Bongaigaon	ASEB	351	323	28
11	RGGVY-Dhuburi	ASEB	393	9	384
12	RGGVY-Nagaon	ASEB	358	125	233
13	RGGVY-N.C.Hills	ASEB	242	76	166
14	RGGVY-Karbi Anglong	ASEB	1380	866	514
15	RGGVY-Lakhimpur	ASEB	544	466	78
16	RGGVY-Dhemaji	ASEB	631	322	309
17	RGGVY-Kokrajhar	ASEB	308	0	308
Total: -			6817	4274	2543

Annexure -4: Power Sourcing in the state of Assam

The table indicates supply status of power in the state of Assam, the average generation (between January to September) was 143 MU and the rest of the demand is met by import of energy. The management of shortfall by open access is a costly option.

Table A 4 - 1: Power Planning of ASEB

	ASEB's net	Import of Energy in **MU** from					Power			**Max**
Period	Generation in **MU**	Central sector	NTPC	Open Access/	DLF	Champawati	Availability	Demand	Shortfall	**Demand**
		agengies		Others		mini hydel PP	in **MU**	in **MU**	in **MU**	in **MW**
Average January to September year 2010	136	164	95	9	6		405	491	86	955
Average January to September year 2011	143	208	85	25	5	1	464	534	70	1034
% Growth	5	27	-11	184	-10		15	9	-19	8

Power Position in Assam as on 21st June'05 onwards is highlighted in Table A 4 – 2. The table A 4-2 indicates the state can manage off peak load, and is in deficit during peak load.

Table A 4 - 2: Power Position in Assam as on 21st June'05 onwards

Power Position in Assam as on 21st June'05 onwards								
					Availability of Power in MW			
					Off Peak		Peak	
Sl No	Generating Station	Installed capacity (MW)	Share of Assam in %	Share of Assam in MW	Central Sector	Share of Assam	Central Sector	Share of Assam
1	**NEEPCO**							
I	Kopili - I	200.0	49.83%	99.66	170.0	84.71	175.0	87.20
II	Kopili - II	25.0	44%	11.00	21.5	9.46	21.5	9.46
III	Khandong	50.0	52.67%	26.34	44.0	23.17	44.5	23.44
IV	RHEP (Ranganadi)	405.0	39.75%	161.00	220.0	87.45	400.0	159.00
V	Doyang	75.0	40.22%	30.17	0.0	0.00	30.0	12.07
VI	AGBPP (Kathalguri)	291.0	52.85%	153.79	257.0	135.82	240.0	126.84
VII	AGTPP (Ramchandra Nagar)	84.0	41.80%	35.11	78.0	32.60	84.0	35.11
VIII	NEEPCO Bilateral					5.70		10.50
2	**NHPC**							
I	Logtok	105.0	25.97%	27.27	20.0	5.19	70.0	18.18
3	**Own Generation**							
I	NTPS	133.5	100%			48.00		47.00
II	LTPS	120.0	100%			43.20		50.80
4	**IPP (DLF)**	24.5	100%			16.00		16.00
5	Total Power available in MW					491.32		595.60
6	Less Transmission Loss (4.5%)					22.11		26.80
7	Net Power Available in MW					469.21		568.80
8	Demand in Assam in MW					377.00		646.00
9	Shortfall in Assam in MW					Nil		77.20
Note:-	1. Out of surplus power available during off peak hours a quantum of 60 MW power exported to							
	UPPCL throughopen access.							
	2. Average 50 MW load shedding done during peak hours due to transformation constraint .							

A snap-shot of Power allotment by ASEB during off-peak load and Peak load is shown in Table A 4-3. However demand is expected to grow significantly due to potential economic development.

Table A 4 - 3 Example of ANTICIPATED AVERAGE power ALLOTMENT for 14.12.2011

ANTICIPATED AVERAGE power ALLOTMENT for 14.12.2011					
GENERATION					
Source	Total Offpeak (MW)	Total Peak MW			
CENTRAL sector + Bilateral	261	620			
IPP (DLF)	7	7			
Chapmamati Mini Hyd.	1	1			
Own Generation	125	215			
TOTAL	394	843			
(-) Trans Loss & Operation constraint	28	59			
NET availability	366	784			
AVERAGE DEMAND	650	970			
AVERAGE SHORTFALL	284	186			
DISTRIBUTION					
Sub Station	OFF-PEAK	PEAK	Sub Station	OFF-PEAK	PEAK
Kahilipara	47	70	Dullavcherra	2	4
Sarusajai	41	67	Pailapool	5	12
Chandrapur	6	9	Panchgram	12	23
Narengi	18	24	Srikona	11	18
Sisugram	20	32	HPC(P)	2	5
Baghjap	4	14	Mariani	4	14
HPC(J)	3	5	Golaghat	5	16
BTPS(Dist. S/S)	0.5	0.5	Jorhat	11	28

Dhaligaon	6	11	Bokajan	3	9
Ashok Paper Mill	1	6	Bokakhat	2	7
Gossaigaon	2	6	LTPS(Dist.S/S)	4	7
Gauripur	5	12	Nazira	20	28
AGIA	3	14	NTPS(Dist.S/S)	7	17
BOKO	1	5	BFCL	0	0
Barnagar	7	18	Dibrugarh	9	25
Nalbari	3	11	Moran	4	13
Rangia	8	24	Tinsukia	15	32
Sipajhar+Baihata	2	8	Rupai	4	9
Rowta	6	16	Ledo	2	8
Depota	12	25	Halflong	2	4
Gohpur	2	6	Umrangshu	2	4
B.Chariali	4	10	PBSL	0.1	0.1
Nalkata	3	10	Dispur	0.6	1.8
Majuli	0	1	Sibsagar	0.1	0.1
Dhemaji	2	8			
Samaguri	11	31			
Diphu+Lumding	4	6			
Sankardev Nagar	6	14			

Annexure 5 Details of Gram Panchayat Certificate

Details of Gram Panchayat Certificate										
Sl. No.	Name of District	Name of Block	Sanctioned Coverage			Name of Package & Contractors	Collected GP Certificate			
			UE	DE	AE		UE	DE	AE	Total
Xth Plan										
1(i)	RGGVY Tinsukia (310001)	Sadia	2x2.5 MVA S/S at Chapakhowa alongwith associated 33KV line(30.0 km.) & 11KV line(8.4 km) in Sadia Circle			Pkg. TSK-1 (JV) of M/s North Eastern Cables & Conductors (P) Ltd., Jorhat, Assam.				
1(ii)	RGGVY Tinsukia (310001)	Tinsukia, Doomdooma, Sadiya & Margherita	251	99	725	Pkg. TSK-2 M/s ECI Engg. & Const. Co. Ltd., Hyderabad.	251	99	725	1075
Total : Tinsukia			251	99	725		251	99	725	1075
XIth Plan										
11(i)	RGGVY Dhuburi (310018)	Agamoni, Rupsi, Debitola, Gauripur, Mahamaya, Bilasipara & Chapar Salkocha	67	171	549	DHB-1,M/s East India Udyog Ltd.,Gaziabad, U.P. 201005.	0	0	0	0
			1x2.5 MVA S/S at Mahamaya Block							
11(ii)	RGGVY Dhuburi (310018)	Nayer Alga, Birsing Jarua, Jamdarhat, South Salmara, Fekamari & Mankachar	70	62	208	DHB-2,M/s Indo Power Projects Ltd.,Rajadanga Main Road,Kolkata-700107	0	0	0	0
			1x2.5 MVA S/s at Jowadanga,Mancachar							
11(iii)	RGGVY Dhuburi (310018)	Golokganj	1	22	25	DHB-3,M/s R. Enterprise,Gossaigaon,Kokrajhar	0	0	0	0
Total : Dhuburi			138	255	782		0	0	0	0
14(i)	RGGVY Karbi Anglong (310023)	Amri, Chithong, Socheng & Rongkhag	300	36	116	KANCH-1, M/s North Eastern Cables & Conductors (P) Ltd.,A.T.Road , Jorhat-1	173	30	85	288
			1x2.5 MVA S/S at Umpani alongwith associated 33 kv & 11 kv lines.							
14(ii)	RGGVY Karbi Anglong (310023)	Howraghat & Rongmongway	227	24	154	KANCH-2, M/s North Eastern Cables & Conductors (P) Ltd.,A.T.Road , Jorhat-1	90	10	60	160

14(iii)	RGGVY Karbi Anglong (310023)	Lumbajanj & Longsomepi	321	29	98	KANCH-3, M/s North Eastern Cables & Conductors (P) Ltd.,A.T.Road , Jorhat-1	105	15	90	210
			1x2.5 MVA S/S at Bokolia alongwith associated 33 kv & 11 kv lines.							
14(iv)	RGGVY Karbi Anglong (310023)	Bokajan & Nilip	341	26	50	KANCH-4, M/s Lumino Industries Ltd.,Pollock Street,Kolkata-700001	270	25	46	341
14(v)	RGGVY Karbi Anglong (310023)	Somelengso	65	11	18	KANCH-5, M/s Lumino Industries Ltd.,Pollock Street,Kolkata-700001	65	11	18	94
Total : Karbi Anglong			1254	126	436		703	91	299	1093
14(i)	RGGVY Lakhimpur (310020)	Bihpuria	23	7	36	LKP-1: M/s Jayanta Khaund,K.B.Road, North Lakhimpur	23	7	36	66
15(ii)	RGGVY Lakhimpur (310020)	Naoboicha	25	8	99	LKP-2: M/s North Eastern Cables (P) Ltd., A.T.Road,Jorhat-1	18	6	30	54
15(iii)	RGGVY Lakhimpur (310020)	Lakhimpur	27	4	70	LKP-3: M/s Jayanta Khaund,K.B.Road, North Lakhimpur	27	4	70	101
15(iv)	RGGVY Lakhimpur (310020)	Narayanpur, Karunabari & Telahi	83	109	172	LKP-4: M/s Chadalavada Constructions (P) Ltd., Hyderabad.	45	35	46	126
15(v)	RGGVY Lakhimpur (310020)	Boginadi, Dhokuakhana & Ghilamora	212	46	126	LKP-5: M/s Win Power Marketing (P) Ltd., Jorhat.	198	36	120	354
			1x2.5 MVA S/S at "Raidengia" alongwith associated 33 KV & 11 KV Lines.							
Total:Lakhimpur			370	174	503		311	88	302	701

Annexure 6: The Handover Statistics of Un-electrified and electrified Villages

		Un-electrified villages				Already electrified village			
Sl. No.	Name of the project	No. of villages sanctioned	No. of villages completed	No. ofvillages energised and handed over	% achievement	No. of villages sanctioned	No. of villages completed	No. of villages energised and handed over	% achievement
1	***3***	***6***	***7***	***8***		***9***	***10***	***11***	
Xth Plan									
1	RGGVY-(Tinsukia)	350	350	350	100	725	725	725	100
Total		**350**	**350**	**350**		**725**	**725**	**725**	
XIth Plan									
11	RGGVY-Dhuburi	393	326	265	67	782	432	357	46
14	RGGVY-Karbi Anglong	1380	1205	935	68	436	406	283	65
15	RGGVY-Lakhimpur	544	511	477	88	503	478	467	93
Total: -		**2317**	**2042**	**1677**	72	**1721**	**1316**	**1107**	64
Grand Total (X+XI)th Plan		**2667**	**2392**	**2027**	76	**2446**	**2041**	**1832**	75

Annexure 7 Infrastructure to Sustain RGGVY infrastructure

Transmission

Assam Electricity grid Corporation (AEGCL) is a successor company of Assam State Electricity Board. It has been consisted as per company of act of 1956and it has been declared as a State Transmission Authority (STU). It started functioning with effect from 10th December 2004. The main responsibility of AEGCL is to transmit power reliably efficient & low-cost through its Extra High voltage substation & extra high voltage substation line.

As the time of starting in 2003 its total length of EHV line about 66 KV was about 3862 CKT Km & that time its Transmitting capacity was 1636.5 MVA.

Hence during the period 523 CKT Km EHV line and 14 Nos of EHV substation has been constructed by AEGCL as per the additional capacity addition 1645 MVA.

The availability of the transmission line during last year is 99.42% to 98.54% respectively, Which is compatible to the any other developed company. Transmission utility during 2009-2010 to 2010-2011 the AEGCL has transmitted 4590 MU (million Unit) to 5045 MU through the grid respectively. The transmission loss during the period is 6.1% and 4.5% respectively.

Present Development activities of AEGCL :

1. 1×16 MV 132/33KV Balipara substation for industrialization as per the deposit scheme of Assam Industrial Development Corporation.
2. 2×16 MVA 132/33KV Dispur Capital substation.
3. Installation of 40 MVA, 80 MVA to 40 MVA transformers at Sisugram, Baku & Agia under "Annual Plan" & "Assam Infrastructure Development".
4. Installation of 2×25 MVA transformer at Pachgram , Hailakandi under NEC scheme.
5. Installation of 16 MVA & 5 MVA transformers at Tinsukia & Durlavsera (Barak Valley) from their own O&M fund of AEGCL.
6. Under ADB Loan (Tranch-1) : a) 220/132 KV substation at Rangia, b)220 KV EHV line 1801 Kms, c)132 KV line : 99 Kms (will be complete by 2013)
7. Under ADB Loan (Tranch-2) : a) Sonapur (Kamrup) 220/132 KV,
   b) Balipara (Sonitpur) 220/132 KV,
   c) Kamakhya , Jorhat, Bordubi, Bordubi , Matia, Bilasipara, Bilasipara & Hailakandi total 6 numbers 132/33 KV.
   d) 220 KV line: 163.5 Kms, 132 KV line: 63 Kms (Target to be in2013).
8. Installation of 110 MVAR capacitor Bank: In 7 different location (Target to be in2013).

9. Jawahar Nagar (Ghy) 220/33KV generation substation (Target to be in 2012).
10. Funded by DONER & NEC : Mirza - 2×50 MVA 220/33 KV
    Azra - 2×16 MVA 132/33 KV
    Kokrajhar – 16+25 MVA
11. Installation of 400/220 KV - 2× 315 MVA substation for receiving Power from Patana (Tripura) & Salakachi Power Substation.
12. Renovation/ Upgradation of 220/132 KV substation at Salakati for receiving power for 3×250 Salakati Power Station (NTPC).
13. Installation of Optical Fiber Network under ADB funding.
14. Improvement & maintenance of State Load Dispatch Centre, Guwahati under ADB funding.

TRANSMISSION TERIFF:

As per "Multiyear Tariff Petition" the transmission tariff for 2009-2010:- 0.7 % , 2010-2011:- 0.71 %, where the transmission of PGCIL is also included.

Annexure 8: Trenche Two Component Details of ADB Funded Assam Power Sector Enhancement Investment Program (Loan No 2677 - Ind)

The Information are also included in Annexure 7.
PACKAGE A
Construction of 220/132/33 KV grid substations.
2X100 MVA 220/132 KV Sonabil grid substation.
2X100 MVA 220/132 KV & 2X40 MVA 132/33 KV Sonapur grid substation
PACKAGE B.
Construction of 132/33 KV grid substations.
2x40 MVA 132/33 KV Kamakhya grid substation (gis).
2x25 MVA 132/33 KV Jorhat (west) grid substation.
2x25 MVA 132/33 KV Bordubi grid substation.
2x16 MVA 132/33 KV Matia grid substation.
2x25 MVA 132/33 KV Bilasipara grid substation.
2x16 MVA 132/33 KV Hailakandi grid substation.
PACKAGE C
Construction of 220 KV double transmission line.
220 KV double circuit lilo at Sonapur from 220 KV double circuit Samaguri – sarusajai line
– length 20 km approx.
220 KV double circuit lilo at Sonabil from 220 KV double circuit Samaguri – Balipara line at Sonabil.
– length 1.5 km approx.
220 KV double circuit marani – Namrup transmission line
– length 142 km approx.
PACKAGE D
Construction of 132 KV double transmission line.
a. 132 KV double circuit lilo at Sonabil from 132 KV double circuitdepota – Gohpur line
– length 1.5 km approx.
b. 132 KV double circuit lilo at Sonapur from 132 KV double circuit Chandrapur – Narangi – Dispur - Kahilipara line at Sonabil.
– length 25 km approx.
c. 132 KV single circuit lilo at Jorhat (west) from 132 KV single circuit Garmur - Bokakhat transmission line.
– length 5 km approx.
d. 132 KV single circuit lilo at Bordubi from 132 KV single circuit Namrup – Tinsukia transmission line.

- length 6 km approx.
e. 132 KV single circuit lilo at Hailakandi from 132 KV Panchgram – Dullavcherra transmission line.
- length 1.5 km approx.
f. 132 KV single circuit on double circuit tower Agia – Matia transmission line.
- length 24 km approx
g. stringing of 2nd circuit of existing 132 KV Samaguri – Lanka transmission line.
- length 61 km approx.
PACKAGE E
PART A
a. replacement of 2x10 MVA transformers by 2x40 MVA transformers at 132/33 Kahilipara grid substation.
b. replacement of 2x16 MVA transformers by 2x25 MVA transformers at 132/33 KV Jagiroad grid substation.
c. replacement of 2x10 MVA transformers by 2x25 MVA transformers at 132/33 KV Gohpur grid substation.
d. replacement of 2x10 MVA transformers by 2x25 MVA transformers at 132/33 KV north Lakhimpur grid substation.
e. replacement of 2x16 MVA transformers by 2x25 MVA transformers at 132/33 KV Lanka grid substation.
f. replacement of 2x10 MVA transformers by 2x25 MVA transformers at 132/33 KV Margherita grid substation.
g. addition of 2x100 MVA 220/132 KV auto transformers and 2x40 MVA 132/33 KV transformers at 220/132/33 KV Tinsukia grid substation.
h. addition of 1x100 MVA 220/132 KV auto transformers at 220/132/33 KV Boko grid substation.
i. addition of 2x25 MVA 132/33 KV transformers at 220/132/33 KV Tinsukia grid substation.
part b
a. extension of 2 (two) of 220 KV line bays at 220/132/33 KV Namrup substation.
b. extension of 2 (two) of 220 KV line bays at 220/132/33 KV Mariani grid substation.
c. extension of 1 (one) number of 132 KV line bay at 132/33 KV Lanka grid substation.
d. extension of 1 (one) of 132 KV line bay at 220/132/33 KV Agia grid substation.
part c
a. installation of 2x5 MVAr 33 KV bus capacitor at 132/33 KV pailapool grid substation.
b. installation of 2x5 MVAr 33 KV bus capacitor at 132/33 KV Gohpur grid substation.
c. installation of 2x10 MVAr 33 KV bus capacitor at 132/33 KV Garmur grid substation.
d. installation of 2x10 MVAr 33 KV bus capacitor at 132/33 KV Sishugram grid substation.
e. installation of 2x5 MVAr 33 KV bus capacitor at 132/33 KV Nazira grid substation.

f. installation of 2x5 MVAr 33 KV bus capacitor at 132/33 KV Panchgram grid substation.
g. installation of 2x5 MVAr 33 KV bus capacitor at 132/33 KV Chandrapur grid substation.
part d
a. replacement of old and obsolete circuit breakers
i. 220 KV sf6 circuit breakers – 12 .
ii. 132 KV sf6 circuit breakers – 61 .
iii. 33 KV sf6 circuit breakers – 61 .
b. replacement of old and obsolete current transformers.
i. 220 KV current transformers – 6 .
ii. 132 KV current transformers – 69 .
iii. 33 KV current transformers – 42 .
c. replacement of old and Obsolete potential transformers.
i. 132 KV potential transformers – 9 .
ii. 33 KV current transformers – 9 .
d. replacement of old and obsolete isolators.
i. 220 KV isolators – 6 .
ii. 132 KV isolators – 26 .
e. replacement of old and obsolete relay & control panels.
i. 220 KV line panels – 2 .
ii. 132 KV line panels – 15 .
iii. 132 KV transformers panels – 2
iv. 132 KV bus coupler panels – 8
f. replacement of old and Obsolete relays by numerical relays.
i. distance relays – 3 .
ii. Transformer differential relays – 4 .
g. replacement of old battery bank by new battery banks.
i. 220 volts battery bank – 1 set.
ii. 110 volts battery bank – 5 sets.

Annexure 9 Circle wise Status of SPPS & IBDF (DTF) Scheme updated

Circle wise status of SPPS/IBDF (DTR) scheme

Sl No	Name of the Circles	No of DTRs handed over to the agents	No of Agents	Total consumers handed over to the agents	No of RGGVY DTRs approved for handing over
1	Cachar	454	245	21410	48
2	KANCH	68	17	4624	25
3	Nagaon	450	141	41267	419
4	Tezpur	28	14	1992	
5	N. Lakhimpur	250	157	12727	
CAZ		1250	574	82020	492
6	GEC-I	40	7	2209	3
7	GEC-II	164	34	17723	180
8	Rangia	158	46	17728	
9	Bongaigaon	286	46	15971	344
10	Kokrajhar	354	57	12685	49
11	Mangoldoi	135	49	11178	95
LAZ		1137	239	77494	671
12	Dibrugarh	345	39	14609	31
13	Jorhat	181	70	10519	
14	Sivasagar	158	26	9486	
15	Tinsukia	171	36	6410	146
UAZ		855	171	41024	177
APDCL		3242	984	200538	1340

Note - Approvals are being accorded for handing over RGGVY DTRs as per proposal submitted by the respective DGMs

Circle wise status of 11 KV feeders of IBDF scheme						
Sl No	Name of the Circles	No of 11 KV feeders selected	No. of feeders for which agreements executed	No of feeders for which MOU signed/LOI issued	No of feeders under processing	No of feeders teminated/ surrendered
1	Cachar	3	1	2		
2	KANCH	1			1	
3	Nagaon	5		2	3	
4	Tezpur	4		3	1	
5	N. Lakhimpur	1	1			
CAZ		**14**	**2**	**7**	**5**	**0**
6	GEC-I					
7	GEC-II	9	1	2	6	
8	Rangia	7	1	5	1	
9	Bongaigaon	25	10	15		2
10	Kokrajhar	4	1	2	1	1
11	Mangoldoi	11	4	2	5	
LAZ		**56**	**17**	**26**	**13**	**3**
12	Dibrugarh	3	2	1		
13	Jorhat	2		1	1	
14	Sivasagar	5	4	1		
15	Tinsukia	5	5			4
UAZ		**15**	**11**	**3**	**1**	**4**
APDCL		**85**	**30**	**36**	**19**	**7**

Out of 20 nos of under processing feeders following 5 nos are advertised in the newspapers:-
1. 11 KV Dakhinpat feeder of Nagaon Electrical Circle.
2. 11 KV Doomdumia feeder of Nagaon Electrical Circle.
3. 11 KV Bechamari feeder of Nagaon Electrical Circle.
4. 11 KV Bhergaon (Khoirabari) feeder of Mangaldoi Electrical Circle.
5. 11 KV Sangbar feeder of KANCH Electrical Circle.

Comments on Uncovered & partially covered comments by IRADE received from REC

While preparing the DPR the position of the revenue village & its connectivity to the nearby transport facilities & other facilities to be given to the contacting agencies had not been taken care of during the preparation of DPR. Assam is a state with a typical terrain having rivers, revaluate, Hills, hillox, dense forest, reserved forests. So while fixing the completion schedule all this things has to be consider properly , so that a adequate completion schedule can be prepared. These are the main reasons the completion schedule as marked in the DPR has slipped.

Because Delays has been occurred may be due to the following reasons:

a) Carriage of Materials due to transport bottleneck.
b) Delayed Receipt of material at site.
c) Improper selection of sub contractor by the main contractor
d) Rejection of materials, like poles, hardware's etc. & replacement in proper time.
e) Uneducated supervisory stuffs & skill workers from the contractor's side.
f) Revision of the REDB at the time of actual work.
g) Minor variation of co ordination between the contractor's stuff & APDCL stuffs.
h) Law & order situation throughout the state & less assistance by the law & order authority.
i) Severe flood situation in low land area...
j) Late receipt of BPL list from the competent authority.
k) Public grievances regarding the BPL list.
l) Whelping attitude from the local statuary authority like Panchyat, Sarpanch & revenue officers.
m) Problem in finalization of ROW for drawing distribution line & Land Acquisition problem for the substation.
n) Theft of materials during construction.

In many cases after release of APL connection by APDCL without augmentation of DT capacity, overloading of feeder as well as DT have been observed. In many cases because of the limitation of DT capacity APL connection cannot be given to the aspirant. Therefore there is a grievance among the consumer. The BPL consumer also not restricted their load as per norms. Therefore, in many villages the infrastructure & DT has been overloaded due to which there are instances of burning out the DTs.

The single point supply has not been so much successful so far & there is many have default in paying the deuce to APDCL. As it is understood already legal action is going to be started against the defaulting franchisees. Under such condition APDCL has made a new model which it is already indicated (feeder wise) in the main write-up. For further reference information

From the Experience of some stakeholders we have noted that as soon as some DTR's are generally handed over to Franchisee APDCL staff's or officers generally gives less attention to the consumer as well as franchisee. Due to lack of coordination at a point of time whatever good may be module fails.

At this stage, APDCL had not divulge any such documents regarding the REDB & VEI in meeting the future demands.

Billing & payment has been done regularly by the concerning Sub division of the APDCL after village is taken over by them.

As I understand the present RGGVY works is prepared considering only the present need only. The second phase of DPR is under preparation considering the future consumer district wise with inclusion of upstream network.

Referring to the views on the stakeholders & their responsibilities, the subject has been covered in the main write-up. However Assam is a state with diverse opinion of various

people. The local Panchyat also not taking proper interest for implementing the different scheme by the government. Majority of the people found illiterate where RGGVY program is implemented, and most of the BPL consumers may not be able to pay their electricity dues. Again, the major energy requirements at those areas are in the evening. But most of power cut happens at that time, so the villagers are not keen to pay their payment of billing. Some of unscrupulous people who indulge theft of energy byHooking.

In many cases,

1) The evaluation of Population to be covered under RGGVY programmes is not done properly, for which sometimes after giving the connection to APL/BPL the DT become overloaded. This is one of the main reasons of failure of DT's.

2) Rampant theft of generally occurred in the remote areas where supervision of APDCL is very less hence overloading of DT's occurs.
3) Quality DT's not properly assessed during testing & commissioning.
4) Failure of Protection circuits Particularly LA.
5) Proper load management of DTR.

(Note: As recently (June 2012) gathered from APDCL Headquarter the average failure of transformers is around 6-7% in the rural areas.

Addendum: The present consumer of APDCL is around 22 Lakhs., Which was around 16 lakhs in the previous year, as per assessment there is a increase of 22 to 23% approx. After completion of present RGGVY work it may go to around 32 lakhs , after two years.

The present yearly energy consumption in Assam State is around 5000MU, which was around 4200 MU in previous year.

As per assessment (2012) almost 5-10% APL connection is pending to be connected by the APDCL all over the state, because of infrastructure facility like VEI, REDB and

DTR. To maintain this infrastructure of RGGVY there will be huge requirement of manpower as well as power demand. APDCL has to take this challenge suitably to maintain the power supply as well as infrastructure

The Data / Information collected During Survey and Stakeholders interaction

Projection of Power Demand in the state of Assam

Availability of extra power with the State for RGGVY villages						
Electricity Demand Projection[1]						
	Electrical Energy Requirement (GWh)			Peak Electrical Load (MW)		
States	2011-12	2016-17	2021-22	2011-12	2016-17	2021-22
Assam	7585	13053	24433	1443	2292	3985
Total all India	968659	1392066	1914508	152746	218209	298253
[1] http://www.scribd.com/doc/57505120/17th-Electric-Power-Survey-Report (Central Electricity Authority Report)						

Actual Power Supply Position of States								(MU)
States	Apr 10-Jan. 11				April 09-March 10			
	Requirement	Availability	Deficit	( )	Requirement	Availability	Deficit	( )
Assam	**5,403**	**5,063**	-340	-6.3	5122	4688	-434	-8.5

Electrification of Public Places

Electrificaiton of Public Places										
S.No.	Name of State/District	Name of Block	Name of Village	Category (UE/PE)	No. of Public places in Village at the time of present survey				No. public places having electricity after RGGVY	No. public places having electricity before RGGVY
					School	Health Center	Community Center	Total		

1	Assam	KARBI ANGLONG	Bokajan	Christan Gaon (02296400)	0				0	
2	Assam		Howraghat	Dighliati Gaon (02200900)	0				0	
3	Assam		Lumbajang	Pattar Gaon (02124300)	1				0	
4	Assam		Nilip	Lekthe Gaon (02321500)	1				1	
5	Assam		Somelangso	Maghar Bosti (02247700)	1				1	
6	Assam	DHUBRI 26-01/89-59	Bilasipara 26-14/90-14	Shaktola (00178200)	1			1	0	
7	Assam		Birshingjarua	Fulkatari (00160400)	1			1	0	
8	Assam		Chapar-Salkocha 26-16/90-28	Segunjhari (00196200)	1			1	0	
9	Assam		Fekamari 25-41/89-53	Kaliralga Pt.I (00222500)	1			1	0	
10	Assam		Rupsi Pt. 26-09/89-54	Rupshi Pt.II (00113600)	1			1	0	
11	Assam	DIBRUGARH 27-28/94.54	Barbarua	Deori Gaon (01641600)	0			0	0	
12	Assam		Khowang (Moran) 27-16/94.53	Kashi Pather (01706200)						

13	Assam		Lahowal 27-28/94.59	Gohain Gaon (016495 00)						
14	Assam		Tengakhat 27-22/95-05	Fekelajan (016878 00)						
15	Assam		Tingkhong 27-22/95-16	Kuli No.1 (017213 00)						
16	Assam	LAKHIMPUR	Boginodi	Goriamari (013259 00)	1		1	2	0	
17	Assam		Dhakuakhana	Lahibari (013577 00)	1			1	0	
18	Assam		Ghilamora	Barkalia N.C. (013732 00)	1			1	0	
19	Assam		Karunabari	Nizlaluk (012873 00)	1			2	1	
20	Assam		Narayanpur	Majgaon (012772 00)	1			1	0	
21	Assam	TINSUKIA	Hapjan	Lesenka Gaon (015522 00)	1	0		1	0	
22	Assam		Kakapathar	Boka Pathar (015988 00)	1	0		1	0	
23	Assam		Margherita	Lama Gaon (016135 00)	1	1		2	1	
24	Assam		Sadiya ***	Ghahpur (015117 00)	1	0		1	0	
25	Assam		Saikhowa	Chengeli Gaon (015374 00)	1	0		1	0	

Implementation Schedule in the District/ Villages/ Proposed substations in the blocks

Adequacy of completion schedule, causes of delays										
S.No.	**State**	**Name of District / DPR Sanction date**	**Name of Block**	**Name of Village**	**Award Based on Substation**	**Date of Award / DPR Sanction Date**	**Scheduled Completion time (in mths)**	**Actual Completion Time (in mths)**	**Delay (in Mths)**	**Reasons for Delay**
		KARBI ANGLONG 25-03-2008			31-01-2009				**Work in Progress**	
1	Assam		Bokajan	Christan Gaon (02296400)	25-03-2008	25-03-2008		Aug-11	40	
2	Assam		Howraghat	Dighliati Gaon (02200900)	25-03-2008	25-03-2008		Jul-11	39	
3	Assam		Lumbajang	Pattar Gaon (02124300)	25-03-2008	25-03-2008		Apr-11	36	
4	Assam		Nilip	Lekthe Gaon (02321500)	25-03-2008	25-03-2008		Sep-11	41	
5	Assam		Somelangso	Maghar Bosti (02247700)	25-03-2008	25-03-2008		Apr-11	36	
6	Assam	DHUBRI 26-01/89-59 05-03-2008	Bilasipara 26-14/90-14	Shaktola (00178200)	12-02-2009	05-03-2008		Feb-11	35	

7	Assam		Birshingjarua	Fulkatari (00160400)		05-03-2008		Feb-11	35	
8	Assam		Chapar-Salkocha 26-16/90-28	Segunjhari (00196200)		05-03-2008		Feb-11	35	
9	Assam		Fekamari 25-41/89-53	Kaliralga Pt.I (00222500)		05-03-2008		Feb-11	35	
10	Assam		Rupsi Pt. 26-09/89-54	Rupshi Pt.II (00113600)		05-03-2008		Dec-10	33	
11	Assam	DIBRUGARH 27-28/94.54	Barbarua	Deori Gaon (01641600)		05-03-2008				
12	Assam		Khowang 27-16/94.53	Kashi Pather (01706200)		05-03-2008				Not Energized
13	Assam		Lahowal 27-28/94.59	Gohain Gaon (01649500)		05-03-2008				Not Energized
14	Assam		Tengakhat 27-22/95-05	Fekelajan (01687800)		05-03-2008				
15	Assam		Tingkhong 27-22/95-16	Kuli No.1 (01721300)		05-03-2008				Not Energized
16	Assam	LAKHIMPUR	Boginodi	Goriamari (01325900)		05-03-2008		Feb-11	35	
17	Assam		Dhakuakhana	Lahibari (01357700)	02-03-2009	05-03-2008		Feb-10	23	
18	Assam		Ghilamora	Barkalia N.C. (01373200)		05-03-2008		Dec-10	33	
19	Assam		Karunabari	Nizlaluk (01287300)		05-03-2008		Apr-10	25	
20	Assam		Narayanpur	Majgaon (01277200)		05-03-2008		Jul-10	28	

21	Assam	TINSUKIA	Hapjan	Lesenka Gaon (01552200)	10th five year plan project	23-11-2005		07-07-2009	43	Substation Commissioned on 30.11.09 & handed over
22	Assam		Kakapathar	Boka Pathar (01598800)		23-11-2005		27-07-2009	44	
23	Assam		Margherita	Lama Gaon (01613500)		23-11-2005		18-02-2009	39	
24	Assam		Sadiya ***	Ghahpur (01511700)		23-11-2005				
25	Assam		Saikhowa	Chengeli Gaon (01537400)		23-11-2005		26-02-2010	51	
ASSAM	**Total**									

Quality and Hours of Supply in the villages

Quality and hours of supply						
S.No.	**State**	**Name of State/District**	**Name of Block**	**Name of Village**	**Hours of Supply**	**Quality of Supply**
1	Assam	KARBI ANGLONG	Bokajan	Christan Gaon (02296400)	8	Satisfactory
2	Assam		Howraghat	Dighliati Gaon (02200900)	8	Satisfactory
3	Assam		Lumbajang	Pattar Gaon (02124300)	12	Satisfactory
4	Assam		Nilip	Lekthe Gaon (02321500)	12	Satisfactory
5	Assam		Somelangso	Maghar Bosti (02247700)	8	Satisfactory
6	Assam	DHUBRI 26-01/89-59	Bilasipara 26-14/90-14	Shaktola (00178200)	18	Satisfactory
7	Assam		Birshingjarua	Fulkatari (00160400)	18	Satisfactory

8	Assam		Chapar-Salkocha 26-16/90-28	Segunjhari (00196200)	18	Satisfactory
9	Assam		Fekamari 25-41/89-53	Kaliralga Pt.I (00222500)	16	Satisfactory
10	Assam		Rupsi Pt. 26-09/89-54	Rupshi Pt.II (00113600)	16	Satisfactory
11	Assam	DIBRUGARH 27-28/94.54	Barbarua	Deori Gaon (01641600)		
12	Assam		Khowang 27-16/94.53	Kashi Pather (01706200)		
13	Assam		Lahowal 27-28/94.59	Gohain Gaon (01649500)		
14	Assam		Tengakhat 27-22/95-05	Fekelajan (01687800)		
15	Assam		Tingkhong 27-22/95-16	Kuli No.1 (01721300)		
16	Assam	LAKHIMPUR	Boginodi	Goriamari (01325900)	13	Satisfactory
17	Assam		Dhakuakhana	Lahibari (01357700)	12	Satisfactory
18	Assam		Ghilamora	Barkalia N.C. (01373200)	13	Satisfactory
19	Assam		Karunabari	Nizlaluk (01287300)	12	Satisfactory
20	Assam		Narayanpur	Majgaon (01277200)	13	Satisfactory
21	Assam	TINSUKIA	Hapjan	Lesenka Gaon (01552200)	18	Satisfactory
22	Assam		Kakapathar	Boka Pathar (01598800)	12	Satisfactory
23	Assam		Margherita	Lama Gaon (01613500)	18	Satisfactory
24	Assam		Sadiya ***	Ghahpur (01511700)	18	Satisfactory
25	Assam		Saikhowa	Chengeli Gaon (01537400)	18	Satisfactory
ASSAM	**Total**					

Billing to and payment by BPL and APL consumer

S.No.	State	Name of State/District	Name of Block	Name of Village	Time taken in release of first Bill in Month	Average Amt. of first Bill	Periodicity of Subsequent Bills	Energy Billed in Units	Average Amount spent on electricity
1	Assam	KARBI ANGLONG	Bokajan	Christan Gaon (02296400)			2		43
2	Assam		Howraghat	Dighliati Gaon (02200900)			2		43
3	Assam		Lumbajang	Pattar Gaon (02124300)			2		40
4	Assam		Nilip	Lekthe Gaon (02321500)			2		38
5	Assam		Somelangso	Maghar Bosti (02247700)			2		35
6	Assam	DHUBRI 26-01/89-59	Bilasipara 26-14/90-14	Shaktola (00178200)			2		215
7	Assam		Birshingjarua	Fulkatari (00160400)			2		
8	Assam		Chapar-Salkocha 26-16/90-28	Segunjhari (00196200)			2		90
9	Assam		Fekamari 25-41/89-53	Kaliralga Pt.I (00222500)			2		
10	Assam		Rupsi Pt. 26-09/89-54	Rupshi Pt.II (00113600)					
11	Assam	DIBRUGARH 27-28/94.54	Barbarua	Deori Gaon (01641600)					

12	Assam		Khowang 27-16/94.53	Kashi Pather (0170620 0)					
13	Assam		Lahowal 27-28/94.59	Gohain Gaon (0164950 0)					
14	Assam		Tengakhat 27-22/95-05	Fekelajan (0168780 0)					
15	Assam		Tingkhong 27-22/95-16	Kuli No.1 (0172130 0)					
16	Assam	LAKHIMPUR	Boginodi	Goriamari (0132590 0)			2		51
17	Assam		Dhakuakhana	Lahibari (0135770 0)			2		44
18	Assam		Ghilamora	Barkalia N.C. (0137320 0)			2		40
19	Assam		Karunabari	Nizlaluk (0128730 0)			2		60
20	Assam		Narayanpur	Majgaon (0127720 0)			2		43
21	Assam	TINSUKIA	Hapjan	Lesenka Gaon (0155220 0)			2		113
22	Assam		Kakapathar	Boka Pathar (0159880 0)			2		105
23	Assam		Margherita	Lama Gaon (0161350 0)			2		152
24	Assam		Sadiya ***	Ghahpur (0151170 0)			2		113
25	Assam		Saikhowa	Chengeli Gaon (0153740 0)			2		152
ASSAM	**Total**								

Status of Electrification as on June 2012 is

sl. no	block	village name	vill .sl. no	status	Census Code	BPL HH electrified	total BPL HH	DTR capacity installed			date of energization	date of handing over to discom	date of taking over by discom
								10kva	16kva	25kva			
1	Barbarua	Deori gaon	12	DE	1641600	0	0	1	0	0	28-03-2012	09-04-2012	01-06-2012
2	Moran	Kashipothar	45	DE	1706200	0	0	0	1	0	07-03-2012	28-05-2012	
3	Lahoal	Gohain gaon	2	DE	1649500	0	27	0	0	1	06-12-2011	13-01-2011	22-12-2011
4	Tengakhat	Fekelajan	32	UE	1687800	7	7	0	1	0	11-01-2012	19-01-2012	16-02-2012
5	Tingkhong	Kulino:i	3	DE	1721300	2	29	0	1	1	15.11.2011	15-12-2011	

Whether Electrification done as per DPR															
S.No.	State	Name of State/District	Name of Block	Name of Village	Category (UE/PE)	Quantity as per DPR				Quantity as per present survey				33/11 KVA Substation in the Block	
						DTs (In Nos.)	DT capacity	HT (in Ckt. Km.)	LT (in Ckt. Km.)	DTs (In Nos.)	DT capacity KVA (each)	HT (in Ckt. Km.)	LT (in Ckt. Km.)		
1	Assam	KARBI ANGLONG	Bokajan	Christan Gaon (02296400)	UE	1	25	3.2	2	1	25 KVA	3.2	2	1x2.5 MVA S/S at Bokolia alongwith associated 33 kv & 11 kv lines.	Work in Progress; DISCOM have arranged alternate route
2	Assam		Howraghat	Dighliati Gaon (02200900)	DE	2	16+25	2.5	2.5	1	25 KVA	2.5	2.5	1x2.5 MVA S/S at Umpanai alongwith associated 33 kv & 11 kv lines.	Work in Progress
3	Assam		Lumbajang	Pattar Gaon (02124300)	UE	1	16	4	1	1	16 KVA	4	1	1x2.5 MVA S/S at Bokolia alongwith associated 33 kv & 11 kv lines.	Work in Progress
4	Assam		Nilip	Lekthe Gaon (02321500)	UE	1	16	2	1	1	16 KVA	2	1	1x2.5 MVA S/S at Bokolia alongwith associated 33 kv & 11 kv lines.	Work in Progress
5	Assam		Somelangso	Maghar Bosti (02247700)	UE	2	16+41	2	3.1	1	41 KVA	2	3.1		
6	Assam	DHUBRI 26-01/89-59	Bilasipara 26-14/90-14	Shaktola (00178200)	UE	1	16	1.5	1	1	**11.936 (16 KVA)**	**1.5**	**1**	1x2.5 MVA S/S at Mahamaya Block	Work in Progress

7	Assam		Birshingjarua	Fulkatari (00160400)	UE (Special) / DE	2	16 (32)	1	1.5	1	**11.936 (16 KVA)**	**1**	**1**	1x2.5 MVA S/s at Jowadanga,Mancachar	Work in Progress
8	Assam		Chapar-Salkocha 26-16/90-28	Segunjhari (00196200)	UE	1	16	0.6	0.8	1	**11.936 (16 KVA)**	**1.221**	**1.591**	1x2.5 MVA S/S at Mahamaya Block	Work in Progress
9	Assam		Fekamari 25-41/89-53	Kaliralga Pt.I (00222500)	UE	3	16 (48)	0.7	2.4	1	**11.936 (16 KVA)**	**2.08**	**2.5**	1x2.5 MVA S/s at Jowadanga,Mancachar	Work in Progress
10	Assam		Rupsi Pt. 26-09/89-54	Rupshi Pt.II (00113600)	UE	1	16	1.2	0.8	1	**11.936 (16 KVA)**	**1.8**	**0.052**	1x2.5 MVA S/S at Mahamaya Block	Work in Progress
11	Assam	DIBRUGARH 27-28/94.54	Barbarua	Deori Gaon (01641600)	DE	1		1.5	0.3	1	10	0.41	0.35		
12	Assam		Khowang (Moran) 27-16/94.53	Kashi Pather (01706200)	DE	1		1.5	0.3	1	10	0.84	0.68	Not Energized	
13	Assam		Lahowal 27-28/94.59	Gohain Gaon (01649500)	DE	1	25	1.5	0.3	1	25	0.77	0.33	Not Energized	
14	Assam		Tengakhat 27-22/95-05	Fekelajan (01687800)	UE	1	0	2.5	0.3	1	16	0.7	0.4		
15	Assam		Tingkhong 27-22/95-16	Kuli No.1 (01721300)	DE	1	16	1.5	0.3	1	16	0.8	0.35	Not Energized	
16	Assam	LAKHIMPUR	Boginodi	Goriamari (01325900)	UE	1	25	2	1.5	1	25 KVA	2.2	0.4		
17	Assam		Dhakuakhana	Lahibari (01357700)	UE (Special) / DE	1	16	2	0.7	1	16	1.4	2.8		

18	Assam		Ghilamora	Barkalia N.C. (01373200)	IE	1	16	1.5	0.8	1	16	0.69	0.8	1 no of 1X2.5 MVA Sub-Station at Raidengia in Ghilamora Block	Handed ovew on 31-03-2011
19	Assam		Karunabari	Nizlaluk (01287300)	UE	2	16+25	1.6	1.5	2	16+25	1.6	0		
20	Assam		Narayanpur	Majgaon (01277200)	UE	1	25	1.5	1.3	1	16	0.5	0.469		
21	Assam	TINSUKIA	Hapjan	Lesenka Gaon (01552200)	UE	2	16+25	3	3	1	18.65 (25KVA)	1.221	1.591		
22	Assam		Kakapathar	Boka Pathar (01598800)	IE	1	16	1.75	1.5	1	11.936 (16 KVA)	2.6	1.4		
23	Assam		Margherita	Lama Gaon (01613500)	UE/DE	3	98	2.5	4.4	1	18.65 (25KVA)	0.8	0.7		
24	Assam		Sadiya ***	Ghahpur (01511700)	UE	2	25 (50)	2	3	1	18.65 (25KVA)	0.4	0.6	2x2.5 MVA S/S at Chapakhowa alongwith associated 33KV line(30.0 km.) & 11KV line(8.4 km) in Sadia Circle	Charged on 30-11-2009 & handed over.
25	Assam		Saikhowa	Chengeli Gaon (01537400)	UE	1	16	2	1.5	1	25	2.6	1		
ASSAM	**Total**					35				26					

Whether Electrification done as per DPR	

S.No.	State	Name of State/District	Name of Block	Name of Village	Category (UE/PE)	Nos. of HHs in a Village at the time of present survey			Nos. of HHs covered under RGGVY (as per DPR)		Nos. of HHs actully electrified at the time of present survey			Reasons for difference/gap	Nos. of HHs energised			Reasons for delay in Energiztion
						No. of BPLs	No. of APLs	Total	No. of BPLs	Total	No. of BPLs	No. of APLs	Total		No. of BPLs	No. of APLs	Total	
1	Assam	KARBI ANGLONG	Bokajan	Christan Gaon (02296400)	UE	62	0	62	21		21	0	21		21	0	21	
2	Assam		Howraghat	Dighliati Gaon (02200900)	DE	52	9	61	29		29	0	29		29	0	29	
3	Assam		Lumbajang	Pattar Gaon (02124300)	UE	26	34	60	7	14	23	0	23		23	0	23	At Umpani in Amri Block, At Bokolia In Longsompai block
4	Assam		Nilip	Lekthe Gaon (02321500)	UE	22	0	22	5	10	6	0	6		6	0	6	
5	Assam		Somelangso	Maghar Bosti (02247700)	UE	82	20	102	39	75	39	0	39		39	0	39	

6	Assam	DHUBRI 26-01/89-59	Bilasipara 26-14/90-14	Shaktola (00178200)	UE	22	23	45	6	9	22	5	27		22	5	27	At Panbari in Mahamaya Block, At Jhowdanga in Mankachar Block under APDRP
7	Assam		Birshingjarua	Fulkatari (00160400)	UE (Special) / DE	202	50	252	32	47	47	0	47		47	0	47	
8	Assam		Chapar-Salkocha 26-16/90-28	Segunjhari (00196200)	UE	108	20	128	6	9	96	0	96		96	0	96	
9	Assam		Fekamari 25-41/89-53	Kaliralga Pt.I (00222500)	UE	136	20	156	106	156	67	0	67		67	0	67	
10	Assam		Rupsi Pt. 26-09/89-54	Rupshi Pt.II (00113600)	UE	16	60	76	73	93	16	0	16		16	0	16	
11	Assam	DIBRUGARH 27-28/94.54	Barbarua	Deori Gaon (01641600)	DE	9	28	37	7	7	9		9		9		9	To bee energized
12	Assam		Khowang 27-16/94.53	Kashi Pather (01706200)	DE	10	22	32	4	4	10		10	Not Energized	10		10	To bee energized

13	Assam		Lahowal 27-28/94.59	Gohain Gaon (01649500)	DE	27	67	94	17	17	22		22	Not Energized	22		22	Electrified
14	Assam		Tengakhat 27-22/95-05	Fekelajan (01687800)	UE	4	20	24	4	4			0				0	Electrified, Substation at Rajgarh and Moran in Moran Block
15	Assam		Tingkhong 27-22/95-16	Kuli No.1 (01721300)	DE	20	40	60	0	0	16		16	Not Energized	16		16	To bee energized
16	Assam	LAKHIMPUR	Boginodi	Goriamari (01325900)	UE	54	22	76	54	79	10	7	17		10	7	17	
17	Assam		Dhakuakhana	Lahibari (01357700)	UE (Special) / DE	18	8	26	13	21	7	7	14		7	7	14	
18	Assam		Ghilamora	Barkalia N.C. (01373200)	IE	8	3	11	160	176	1	1	2		1	1	2	Raidengia in Ghilamora Block
19	Assam		Karunabari	Nizlaluk (01287300)	UE	22	6	28	128	232	16	0	16		16	0	16	
20	Assam		Narayanpur	Majgaon (01277200)	UE	35	25	60	15	27	8	0	8		8	0	8	
21	Assam	TINSUKIA	Hapjan	Lesenka Gaon (01552200)	UE	108	20	128	64	105	90	0	90		96	0	96	

22	Assam		Kakapathar	Boka Pathar (01598800)	IE	90	35	125	26	38	55	0	55		55	0	55	
23	Assam		Margherita	Lama Gaon (01613500)	UE/DE	220	30	250			44	2	46		44	0	44	
24	Assam		Sadiya ***	Ghahpur (01511700)	UE	70	40	110	51	77	10	0	10	Release of BPL connection is linked with Electrification. The BPL connections are released in batches.	10	0	10	Proposed At Chapakhua in Sadia Civil Block
25	Assam		Saikhowa	Chengeli Gaon (01537400)	UE	90	40	130	14	22	59	0	59		59	0	59	

S.No.	State	Name of State/District	Name of Block	Name of Village	Category (UE/PE)	RHH	No. of APL HHs at the time of Survey	APL connections before RGGVY	APL connections after RGGVY	APL HHs not applied for connection	APL HHs applied for connection but not released
1	Assam	KARBI ANGLONG	Bokajan	Christan Gaon (02296400)	UE	62	0	0	0	NA	NA
2	Assam		Howraghat	Dighliati Gaon (02200900)	DE	61	9	0	0	NA	NA

3	Assam		Lumbajang	Pattar Gaon (02124300)	UE	60	34	0	0	NA	NA
4	Assam		Nilip	Lekthe Gaon (02321500)	UE	22	0	0	0	NA	NA
5	Assam		Somelangso	Maghar Bosti (02247700)	UE	110	28	0	0	NA	NA
6	Assam	DHUBRI 26-01/89-59	Bilasipara 26-14/90-14	Shaktola (00178200)	UE	45	23	0	5	NA	NA
7	Assam		Birshingjarua	Fulkatari (00160400)	UE (Special)/ DE	250	30	0	0	NA	NA
8	Assam		Chapar-Salkocha 26-16/90-28	Segunjhari (00196200)	UE	128	20	0	0	NA	NA
9	Assam		Fekamari 25-41/89-53	Kaliralga Pt.I (00222500)	UE	156	20	0	0	NA	NA
10	Assam		Rupsi Pt. 26-09/89-54	Rupshi Pt.II (00113600)	UE	76	60	0	0	NA	NA
11	Assam	DIBRUGARH 27-28/94.54	Barbarua	Deori Gaon (01641600)	DE		28	0		NA	NA
12	Assam		Khowang 27-16/94.53	Kashi Pather (01706200	DE		22	0		NA	NA

				)							
13	Assam		Lahowal 27-28/94.59	Gohain Gaon (01649500)	DE		67	0		NA	NA
14	Assam		Tengakhat 27-22/95-05	Fekelajan (01687800)	UE		20	0		NA	NA
15	Assam		Tingkhong 27-22/95-16	Kuli No.1 (01721300)	DE		40	0		NA	NA
16	Assam	LAKHIMPUR	Boginodi	Goriamari (01325900)	UE	79	22		7	NA	NA
17	Assam		Dhakuakhana	Lahibari (01357700)	UE (Special)/ DE	26	8	0	7	NA	NA
18	Assam		Ghilamora	Barkalia N.C. (01373200)	IE	11	3	0	1	NA	NA
19	Assam		Karunabari	Nizlaluk (01287300)	UE	28	6	0	0	NA	NA
20	Assam		Narayanpur	Majgaon (01277200)	UE	60	25	0	0	NA	NA
21	Assam	TINSUKIA	Hapjan	Lesenka Gaon (01552200)	UE	128	20	0	0	NA	NA
22	Assam		Kakapathar	Boka Pathar (01598800)	IE	125	35	0	0	NA	NA

23	Assam		Margherita	Lama Gaon (01613500)	UE/DE	250	30	0	2	NA	NA
24	Assam		Sadiya ***	Ghahpur (01511700)	UE		40	0	0	NA	NA
25	Assam		Saikhowa	Chengeli Gaon (01537400)	UE	130	40	0	0	NA	NA
ASSAM	**Total**							0	22	NA	NA

		Commercial loss w/o subsidy		Subsidy		cost of Supply		Average Tariff		AT & C Losses		Agriculture consumption		Agri. Tariff	
		2008-09 (Prov)	2009-10 RE	2008-09 (Prov)	2009-10 RE	2008-09 (Prov)	2009-10 RE	2008-09 (Prov)	2009-10 RE	2008-09 (Prov)	2009-10 RE	2008-09 (Prov)	2009-10 RE	2008-09 (Prov)	2009-10 RE
1	Assam	43.98	107.81	0	0	526.47	505.15	491.56	450.76	37.03	33.55	0.72	0.91	4.89	4.98

Sl. No.	State/Discom	2007-08		2008-09		2009-10	
		Agricultural Revenue		Agricultural Revenue		Agricultural Revenue	
		Rs. Crores	Rs./Kwh	Rs. Crores	Rs./Kwh	Rs. Crores	Rs./Kwh
1	Assam						
	CAEDCL	5	-	5	4.16	-	-
	LAEDCL	2	6.57	2	4.13	-	-
	UAEDCL	2	5.92	1	5.81	-	-
	APDCL	-	-	-	-	10	3.57

ABBREVIATION

ACA	Additional Central Assistance
ADB	Asian Development Bank
AEDA	Assam Energy Development Agency
AEGCL	Assam Electricity Grid Corporation Limited
AGM	Assistant General Manager
AID	Assam Infrastructure Development
APDCL	Assam Power Distribution Corporation Limited
APDRP	Accelerated Power Development and Reform Programme
APL	Above Poverty Line
ARR	Average Revenue Return
ASEB	Assam State Electricity Board
AT&C	Aggregate Technical and Commercial
BDO	Block Development Officer
BIDC	Bodoland Infrastructure Development Company
BOQ	Bill of Quantity
BPL	Below Poverty Line
BST	Bulk Supply Tariff
BTPS	Barauni Thermal Power Station
CAEDCL	Central Assam Electricity Distribution Corporation Limited
CPSUs	Central Public Sector Undertakings
DC	District Collector
DDG	Decentralised Distributed Generation
DGM	Deputy General Manager
DIB	Director Intelligence Bureau
DISCOM	Distribution Company
DM	District Magistrate
DPR	Detailed project Report
DT	Distribution Transformer
DTR	Distribution Transformer
DVC	Damodar Valley Corporation
EE	Executive Engineer
EHV	Extra High Voltage (132 KV, 220 KV)
EPC	Engineering Procurement and Construction
FIR	First Information Report
FRP	Feeder Renovation Programme
FY	Financial Year
GENCO	Generation Company
GM	General Manager

GoA	Government of Assam
GOI	Government of India
HLS	Home Lighting System
HT	High tension (For the project 33 & 11 KV)
HVDS	High Voltage Distribution System
IA	Implementing Agencies
IBDF	Input Based Distribution Franchisee
IL & FS	Infrastructure Leasing and Financial Services
IPP	Independent Power Plant
IPPL	Ino Power Project Limited
JE	Junior Engineer
JNNSM	Jawaharlal Nehru National Solar Mission
JS	Joint Secretary, Government of India
KV	Kilo Volt
KVA	Kilo Volt Ampere
KW	Kilo Watt
KwH	Kilo-watt Hour
LAEDCL	Lower Assam Electricity Distribution Corporation Limited
LOA	Letter of Award
LT	Low tension (440 V & 220 V Supply)
LTDB	Low Tension Distribution Board
LTPS	Lakwa Thermal Power Station
MNP	Minimum Needs Programme
MNRE	Ministry of New and Renewable Energy
MoP	Ministry of Power
MU	Million Units
MVA	Mega Volt Ampere
MW	Mega Watt
NEEPCO	North Eastern Electric Power Corporation Limited
NGOs	Non-Governmental Organizations
NHPC	National Hydro Electric Power Corporation
NHPC	National Hydroelectric Power Corporation
NREGA	The Mahatma Gandhi National Rural Employment Guarantee Act - 2005
NTPC	National Thermal Power Corporation Limited
NTPS	Namrup Thermal Power Station
O&M	Operation and Maintenance
PEO	Programme Evaluation Organization
PGCIL	Power Grid Corporation of India Limited
PIA	Project Implementation Agency
PMGY	Pradhan Mantri Gram Yojana
PPP	Public Private Partnership

PWD	Public Works Department
R-APDPR	Restructured Accelerated Power Development and Reform Programme
RE	Rural Electrification
RE	Renewable Energy (Context specific)
REC	Rural Electrification Corporation
REDB	Rural Electrification Distribution Backbone
REM	Rural Electrification Monitoring)
REP	Rural Electrification Plan/ Policy
REW	Rural Electrification Wing
RGGVY	Rajiv Gandhi Grameen Vidyutikaran Yojana
RHEP	Ranganadi Hydro Electric Project
RVE	Remote Village Electrification
S/S	Sub Station
SCADA	Supervisory Control and Data Acquisition
SCCP	Scheduled Caste Component Plan
SE	Superintending Engineer
SEB	State Electricity Board
SERC	State Electricity Regulation Commission
SHP	Small Hydro Project
SLDC	State Load Despatch Centres
SLS	Street Lighting System
Solar (CSP)	Solar (Concentrated Solar Power)
SPPS	Single Point Power Supply
SPV	Solar Photo Voltaic
SS	Sub Station
SSE	Small Scale Enterprises
T&D	Transmission and Distribution
TDF	Tribal Development Front
ToR	Terms of Reference
TRANSCO	Transmission Company
TSP	Tribal Sub-Plan
UAEDCL	Upper Assam Electricity Distribution Corporation Limited
UE/DE	Un-Electrified/De-Electrified
VEI	Village Electrification Infrastructure
XEN	Executive Engineer
HVDS	High Voltage Direct Current
REC	Renewable Energy certificates (special case ; where-ever applicable)

Report on Evaluation of Rajiv Gandhi Grameen Vidyutikaran Yojana (RGGVY) in the state of Gujarat

Submitted to:
Rural Electrification Corporation (REC), New Delhi

Submitted By:
Integrated Research and Action for Development (IRADe), C-80, Shivalik, New Delhi -110017

Report On

Evaluation of the Rajiv Gandhi Grameen Vidyutikaran Yojana (RGGVY) Programme: State of Gujarat

REC
Endless energy. Infinite possibilities.

Submitted to: Rural Electrification Corporation (REC)

Integrated Research and Action for Development
IRADe

Submitted By: Integrated Research and Action for Development (IRADe)
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August 2012

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Executive Summary

"Evaluation of RGGVY Programme" in the state of Gujarat; study covers analysis based on survey conducted in the five districts of Gujarat. The five districts are Anand (MGVCL DISCOM), Sabarkantha (UGVCL), Kutchchh (PGVCL), Jamnagar (PGVCL) and Rajkot (PGVCL)[1].

Currently all the villages in the state of Gujarat are electrified. The accelerated process of electrification of rural areas had started more than 15 - 20 years back, under various state Government schemes. The state government has ensured availability of quality power to all consumers at reasonable rates, which is essential for sustained socio-economic growth.

Gujarat Urja Vikas Nigam Ltd. (GUVNL) is the holding company. It has delegated implementation tasks of RGGVY programme to DISCOMs. The Government of Gujarat has parallel rural electrification programme and has implemented Jyoti Gram Yojana (JGY) for 24 x 7 power supplies to rural areas. The highlights of the scheme are that it provides separate feeder for irrigation for agriculture as well as domestic and commercial consumers. There are other supplementary schemes for the marginalized population that can be also considered for rural electrification launched by the State Government. These are Tribal Area Sub Plans (TASP) (by GETCO), Sagarkhedu, Zhupadpatti, and High Voltage Distribution Systems (HVDS) (KHUSY).

The implementation of RGGVY programme in the districts is executed according to a Detailed Project Report (DPR). The DPRs cover provisioning of infrastructure for releasing connection to scattered households, infrastructure systems that include distribution transformers, HT & LT lines and service connections to BPL consumers. Due to prior experience of Rural Electrification DPR preparation was based on plausible assumptions, and the scope of work planned was less than other states surveyed in the study. The task is shared between RGGVY Programme and JGY. Augmentation of existing 66/11KV S/S; has not been shown in DPR referred in the study. During survey the village infrastructure was inspected as per the drawing available at the circle office. It was found that village distribution infrastructure has been created as per the DPR and as per the approved drawing. Before infrastructure charging and hand over, inspection and monitoring is done by qualified inspectors as specified in 3 tier monitoring provisions. The construction defects and material shortages are indicated by the inspecting agencies, and these are rectified by Project Implementation Agency (PIA). The quality of the infrastructure is very good.

[1]Uttar Gujarat Vij Company Ltd. (UGVCL); Madhya Gujarat Vij Company Ltd. (MGVCL); Paschim Gujarat Vij Company Ltd. (PGVCL), Dakshin Gujarat Vij Company Ltd. (PGVCL),

All the transformers, HT and LT poles installed were found to be in good condition on visual observation. The handing over and taking over process appeared to be streamlined and Panchyats have issued completion certificates. Project implementation schedule was adhered to at local level. But implementation at district level got delayed beyond 18/24 months.

The DISCOMs have developed systematic management, administration, governance structure of the electricity network by planning of spares, scheduled maintenance plan, human resources and their capacities. However there are scopes of further improvements. Management should provide and implement a strategy for total quality management with work force, and emerging Franchisees.

The consumers are getting power supply for 22 to 24 hours. During the fault, or breakdowns in the network DISCOMs employees are immediately attending the fault and restoring power supply. It is learnt that the people are getting information of shut down for planned maintenance purposes by the concerned Divisional Office, through the leading news papers for the date and shut down period. Agriculture consumers get power supply for irrigation for 8 hours per day in rotation under JGY. In the villages surveyed, there were no commercial activities, except for the milk collection centre.

No "Above Poverty Line" (APL) consumers are included in the RGGVY-DPR. As the infrastructure and power are already available, they are getting connections in the villages on submission of application within 30 days. There is no segregation of APL RGGVY or any other scheme as the villages are already electrified. The advance planning for new connection is made by DISCOMs on the basis for connection released during previous five years records. Accordingly material is being procured to release connections. Normally connections are released within one month on making payment by consumers if falls in "A" (Proximity to existing infrastructure) category. In case of other category consumers connections are released as per the Standard of Performance (time limit laid in consultation with GERC) as per Citizen Charter. Figure 1 indicates that electrification of households are on-going process and the connections are released according to application and sanctions available. When compared to increase in APL connection following RGGVY implementation, only 45 and 55 APL connections in the surveyed villages of Rajkot and Jamnagar were released.

It is noticed that all RGGVY consumers are getting bill regularly bi-monthly. More than 95% villagers pay the electricity bills regularly in Gujarat. Collection efficiency varies from 85% to >100% (includes arrears). They generally walk to a bill collection centre or camp which gets organized by the DISCOM from time to time. 5 –10 % of the villagers do not pay bills in a

regular manner. Ten cases of disconnections were noted in the surveyed villages due to vigilance action.

The cash collection franchises are in operation in Paschim Gujarat Vij Company Ltd. (PGVCL); these are in 5175 numbers. In case of MGVCL, UGVCL franchises (e-gram, post office, MEGA) are in practice. Here other kinds of franchises (e-gram, post office) are also being developed, these are (a) Cash collection (b) On Spot billing (c) HT /LT line maintenance (d) Erection of HT/LT/TC and (e) Replacement of T/C.

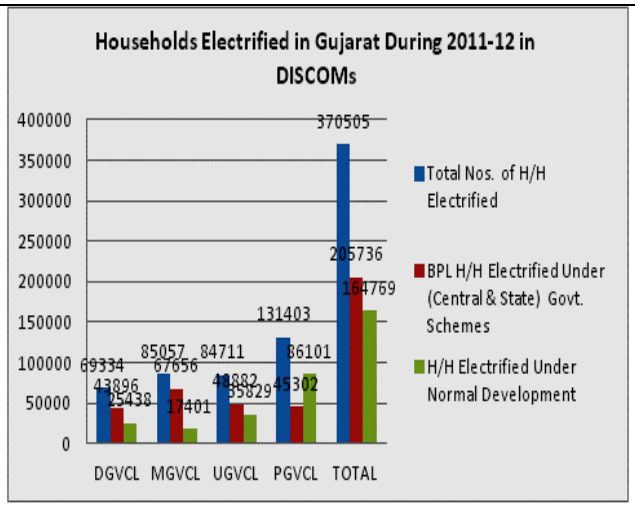


Figure 1: Household electrified in Gujarat During 2011-12 in DISCOMs

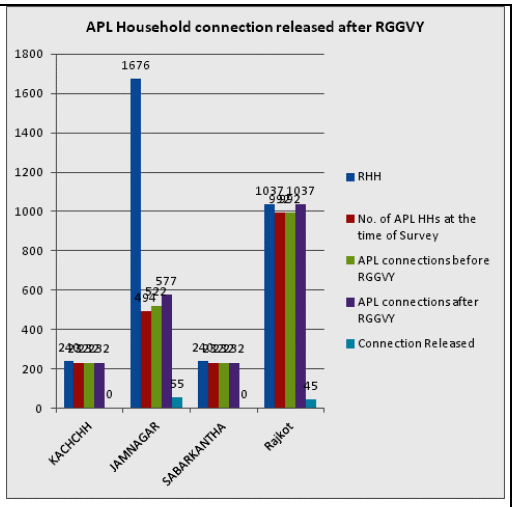


Figure 2: Rural Households and APL connection released after RGGVY

Socio-economic impact of village electrification under the scheme in respect of standard of living, education, health, employment opportunities etc

The socio-economic profiles of consumers in surveyed villages were agriculture based. From employment point of view 421 consumers were agriculture land owners followed by agricultural laborers. The survey showed that only few households in Sabarkantha, Anand are working under the Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA). Average income of BPL and APL families in the surveyed villages were Rs. 30,810 Rs per year. There is large scope for enhancing their household income by systemizing preservation and processing of perishable items. An intensive inter-linkage module between MGNREGA, RGGVY and other Bharat Nirman Programme can be developed. The Rural electrification policy also aims to

facilitate overall rural development, employment generation and poverty alleviation in the village. Current professional profile of earning member of households surveyed in indicated in Figure , the value 0% indicates very few numbers.

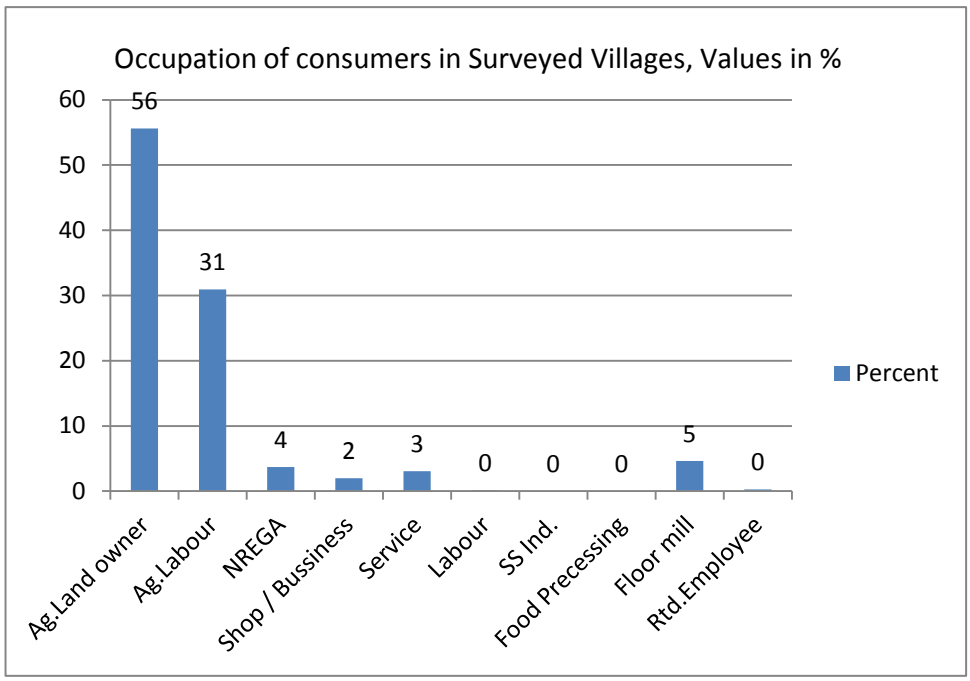


Figure 3: Profile of Consumers and his profession.

The survey responses from rural BPL families on socio-economic developments are encouraging. The general response was that electricity has improved quality of their lives by helping them get good comfort, education and better facilities in the household. Women in villages, particularly in BPL households, have been the biggest beneficiary of electricity as it helps them in cooking and carrying out other house related activities under improved and healthy working conditions. The quality electricity infrastructure in the villages will facilitate in implementing Bharat Nirman Agenda effectively. District Electricity Committee can pursue socio-economic development and generate livelihood and economic opportunities taking advantage of electricity infrastructure. The state development agenda may be included

In all the surveyed villages no industrial (Small scale/cottage) activities were found. However at household level, small activities were being conducted, such as like weaving, handicraft, tailoring etc. The villages under survey have low population and less development compared to neighboring big villages. Except for few surveyed villages, there is scope for development of commercial activity like their neighboring large villages.

A total of 32 primary schools, 3 High schools and 1 Engineering College was found in sample villages, and all of these were electrified, with appropriate facilities. These had FTL, bulbs and fans. There are also community places like; 18 numbers of Milk collection centers in surveyed villages; these have electricity connections. The Gram Panchayat offices are electrified, at all surveyed villages. Most of these were electrified before RGGVY scheme. Some of the big villages nearby the surveyed village had potential to be an urban area in future. Rural electrification in the state can sustain PURA mission of Ministry of Rural Development.

Provision of subsidy made by the state government for supply of electricity

The government of Gujarat provides subsidy for the Agricultural usage that has been developed under JGY. The DISCOMs have very good consumer mix of Industrial, commercial, domestic, institution and rural connection to sustain revenue collection. There is subsidy in tariff for the BPL consumers in the rural areas. The state DISCOM and regulatory commission do not indicate any cross subsidy. The DISCOMs under GUVNL are making profit.

Extra power in the state to meet the need of newly electrified villages

The DISCOMs are in a position to cater to the demand by existing facilities by augmentation of DTs. There is a need for workable commercial activity, for which DISCOMs can provide separate connection. BPL consumers are getting connection in RGGVY scheme and also under schemes like Zupadpatti, Kutir Jyoti, TASP (Tribal Area Sub Plan) and SCSP (Schedule Cast Sub Plan) of Gujarat Government. These connections are provided to weaker sections of the society. Proper fund is also allocated for meeting the demand with planned backward linkages, generation and transmission system in the State. The consumption pattern indicated higher demand growth in agriculture and commercial sector. GUVNL is planning according to consumption pattern and arranging purchase of power proactively. Sufficient generating capacity and transmission net work will be needed for meeting rural power demand envisaged under various developmental schemes. Gujarat State Electricity regulation Commission is in position to plan to service the demand with GUVNL.

States have formulated and adopted the Rural Electrification Policy

The Rural Electrification (RE) Plan is formulated for the State to translate National Rural Electrification Policy, vide notification no. GU-2006-31-ELA-1105-CS-GoI-19-K dated 31st March-2006. The main objective of Rural Electrification Plan is to draw a road map for rural electrification in Gujarat. The rural electrification plan may be revised based on census 2011; there by emphasizing on (a) development of rural commercial activity (b) development of small scale industries (c) linkages of renewable energy system to the grid using appropriate technology

(d) Planning by pooling power demand and supply at block or district level. This will indicate opportunities for renewable energy in the state, (d) opportunities for CSR investments and incentives for interested entrepreneurs.

HVDS implementation through RGGVY

In the entire villages surveyed, HVDS mode of distribution has been done. Three phase transformer are installed for industrial or agricultural consumers which are again of smaller rating to ensure that no more than three consumers in generally are fed from one transformer. Aerial bunched conductors (ABC) have been used to eliminate theft.

DDG scheme in its present form

The state has not applied and availed benefit of DDG scheme under RGGVY programme. The Gujarat Urja Vikas Nigam Ltd. (GUVNL) and GEDA have specific solar and wind energy policy for the state. The state has been in forefront in generating biomass energy. The state has a long coastline; there the wind power schemes are being implemented.

Gujarat state is supplying electricity to the villages through Grid net work. GEDA is working on large-scale renewable energy schemes in PPP mode. By synchronizing the effort of DISCOM (GUVNL) and GEDA a process and platform can be created for integration of emerging renewable energy system and Grid supply.

Suggest methods for better and effective implementation

RGGVY programme and Jyoti Gram Yojana has given new emphasis to rural electrification programme by giving incentives of huge investments through REDB and VEI. DISCOMs under GUVNL have developed good services delivery system. The performances in the urban areas are good, that has to be extended to rural areas as demand is expected to grow with rural economic development. The quality manual of Madhya Gujarat DISCOM is quite comprehensive and that can be shared with other states. Some of the opportunities that can be added over above various initiatives taken by state government are as follows;

1. In the state the transformer failure in the rural areas is quite high especially in the Paschim and Uttar DISCOM region. No illegal connection was noticed in the surveyed villages, and transformer loads are monitored by competent authority. The separate feeder for agriculture connection is provided. Hence the transformer installation, and network planning be given adequate importance.

Sl. No.	Name of DISCOM	Transformer March 2011	Transformer Failed 2010-2011	Failure in %
1	DGVCL	53493	6996	13.08
2	MGVCL	56177	2792	4.97
3	UGVCL	124128	11171	9
4	PGVCL	207297	39006	18.82
	TOTAL	441095	57173	12.96

Table 1: Transformer failure rate in Gujarat in each DISCOM

Considering good maintenance practices in DISCOMs, the issue may be earthing at the time of installation; that may be supervised. UGVCL and PGVCL is comparatively dry area, though for last few years region is getting sufficient rain. "Total Quality Management" module may be developed for the DISCOM employees and emerging Franchisees. Motivation of the teams to provide quality services to rural consumers and entrepreneurs will be enhanced.

2. Considering the quantum of work in future and maturity of DISCOMs in the state in executing rural electrification project; DISCOMs can execute the task of rural electrification on its own. This will reduce implementation time and better project Management.

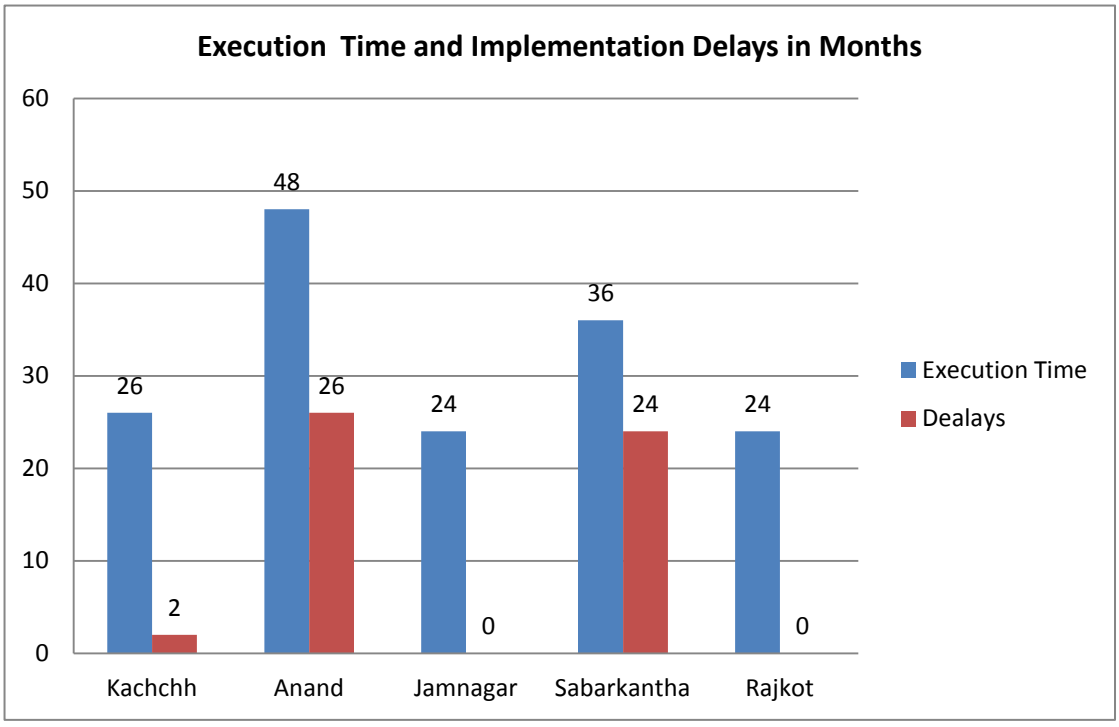


Figure 4: Project implementation time and delays (Months)

Delays were observed in Anand and Sabarkantha districts; delays were calculated with 22/24 months base; not 18 months. Delay in Anand was due to scope of work re-adjustments and Sabarkantha delays were due to forest clearances.

3. ESCos can be encouraged for pump-set replacement connected to agriculture feeder.
4. Nonfarm Economic activities need to be encouraged. More economic opportunities should be created to attract investment under corporate social responsibilities (CSR). Success of CSR will attract more entrepreneurs for rural electrification. DDG is one of the area where their participation in collaboration with GEDA may be looked into.
5. The financial sustainability of rural infrastructure is a problem as the quantum of electricity consumed is less and corresponding revenue generation is less. To increase the power supply for consumption by the rural people requires more paying capacity by the population. DISCOMs are also struggling hard for managing and maintaining from the financial angle.
6. R-APDRP should be extended to RGGVY system and the DTR be provided with smart meters.

Chapter 1: Background of the Study

The Government of Gujarat gave special emphasis on development of power sector, as power is a vital necessity for socio-economic growth and development of the state. Electrification of the rural areas in the state of Gujarat started few decades back, under various State Government schemes. Currently most of the villages in the state are electrified. The government is ensuring availability of quality power to all consumers at reasonable rates that are essential for sustained socio economic growth.

The Rajiv Gandhi Grameen Vidyutikaran Yojana (RGGVY) is one of the flagship programs of the central government to develop electricity network in rural areas and provide electricity connection to BPL (below poverty line) population in the villages. In the context of earlier electrification status in the state, the RGGVY programme is focused on development and strengthening of Rural Electricity Distribution Backbone (REDB) and providing new connections to BPL families. It is being implemented in nearly all districts of the state.

The rural electrification infrastructure and facilities were extended to all type of consumers to cater to their domestic, agricultural and commercial needs. All tasks pertaining to rural electrification that included planning, erection, commissioning, operation and maintenance of the network was managed by the Gujarat Electricity Board (GEB)/ Gujarat Urja Vikas Nigam Limited (GUVNL) and executed by four DISCOMs.

In accordance to the Electricity Act 2003 that was passed by the Central Government, the Government of Gujarat passed the Gujarat Electricity Industry (Re-organization & Regulation) Act, 2003, to restructure the electricity infrastructure management and administration in the state, to improve efficiency in management and delivery of services to consumers.[2] The existing Gujarat Electricity Board (GEB) was reorganized effective from 1st April, 2005 in to seven companies with functional responsibilities like trading, generation, transmission and distribution. Gujarat Urja Vikas Nigam Ltd. (GUVNL) was established as a Holding Company of six other companies with following assigned responsibilities:

(a) Gujarat State Electricity Corp. Ltd. (GSECL) is responsible for generation

(b) Gujarat Energy Transmission Corp. Ltd. (GETCO) is responsible for transmission that means for management of power distribution to consumers of every profile in urban and rural areas

[2] http://www.gseb.com/guvnl/index.aspx; Accessed December 2011. The four Gujarat Vij Company Limited has been referred as DISCOM in the document

(c) Uttar Gujarat Vij Company Ltd. (UGVCL) to manage distribution in districts in northern region, having head quarters in Mehsana

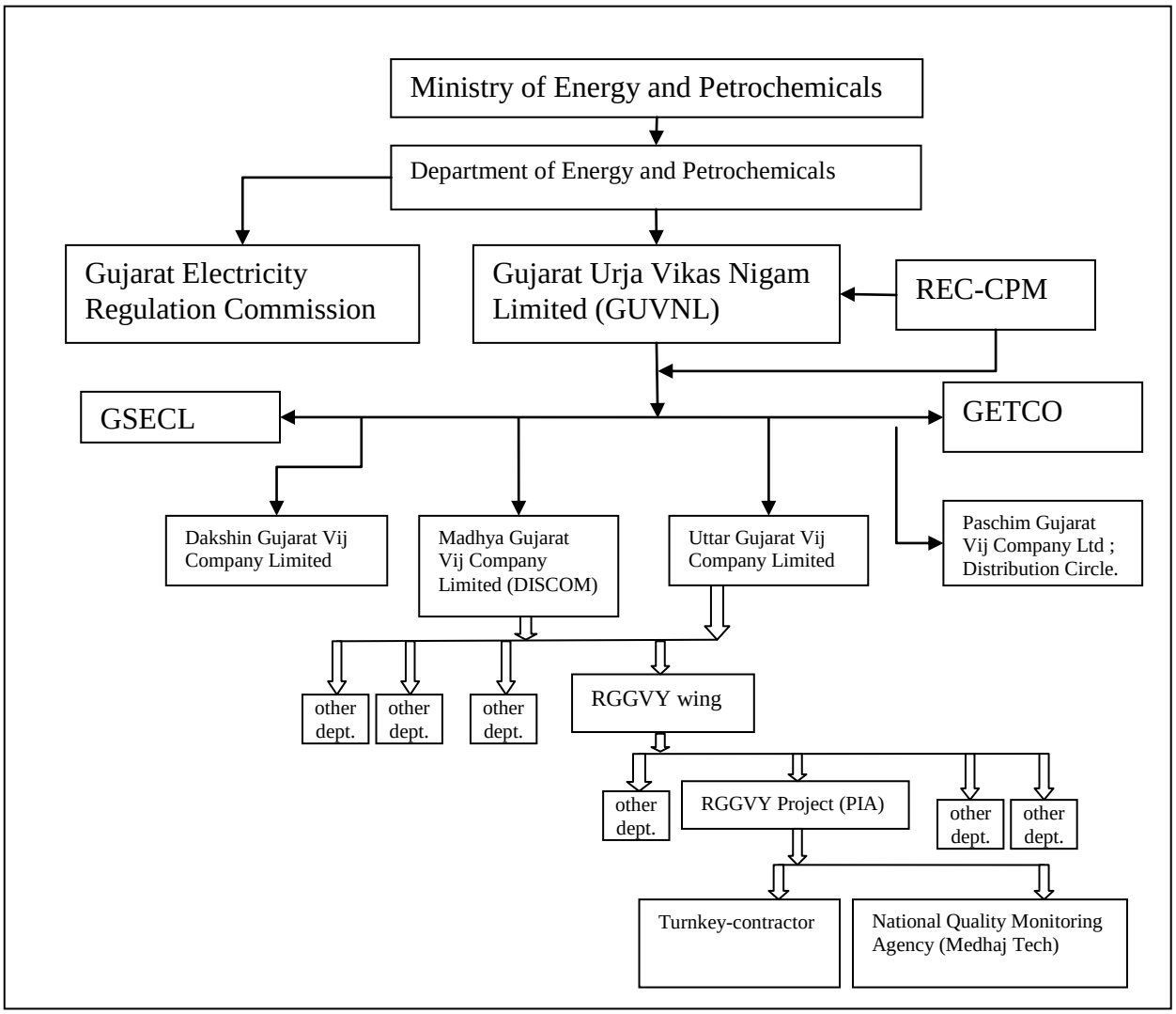
(d) Dakshin Gujarat Vij Company Ltd. (DGVCL) to manage dDistribution in districts in southern region with head quarters in Surat

(e) Madhya Gujarat Vij Company Ltd. (MGVCL) to manage distribution in districts in central region, head quarters at Vadodara

(f) Paschim Gujarat Vij Company Ltd. (PGVCL) to manage distribution in districts in western region having head-quarters at Rajkot.

The administration structure of RGGVY implementation in the state of Gujarat is shown in the

Figure 1-1: Administrative Structure of Rural electrification in the State of Gujarat



The overall authority of the executive structure lies with Ministry of Energy and Petrochemicals organized by Department of Energy and Petrochemicals. The department of Energy and Petrochemicals is supported by GUVNL and Gujarat Electricity Regulation Commission for regulatory tasks. The REC is represented in the state by state level site office located at Vadodhara. PGCIL (CPSU-PIA) was assigned the task of project implementation in the 10th Five Year Plan projects; hence it was included in the chart.

Hon'ble Prime Minister gave a call "Power to all by 2012". RGGVY Programme has made it practically feasible to realize the objective enshrined in the "National Electricity Policy" and "National Rural Electrification Policy" i.e. Access to electricity for all by 2012. For improving the distribution efficiency by reducing Agregate Technical and Commercial (AT&C) losses, the Gujarat State Government have embarked on ambitious target, i.e. "Golden Goal". Under this target the Gujarat State Governemnt committed to:

- Power to all by 2012 and
- Reduction in AT&C losses to less than 15%.

The task of implementation of RGGVY programme and rural electrification programme of state government is assigned to these distribution companies (DISCOMs). They are responsible for planning, projects, erection and commissioning, supply and operation of rural electrification and delivery of services to consumers. To strengthened the RGGVY programme, the Gujarat government has their own rural electrification programme "**The Jyotigram Yojana" (JGY).** This programme was formulated with the following objectives:

- Bifurcation of Rural feeders into: (a) Agricultural feeders catering solely to demand for agricultural purposes, in this feed 8 hours supply is provided cyclically (b) Rural feeders for meeting the power demand of rural population that is other than agricultural loads
- Erection of 11 / 22 KV lines in rural areas to separate out the agricultural load from village transformer centre. This includes (a) Providing meters on village distribution transformer centers and also taking measures such as pilfer-proofing to prevent the illegal use of phase splitters and tapping of lines. (b) Providing round-the-clock (24 hours) 3-phase power supply to consumers other than the Agricultural Consumers[3], [4]

The state of Gujarat has taken separate initiatives under JGY to strengthen their electricity distribution network system. The initiatives are focused on providing new connections to non-

[3] http://www.mgvcl.com/; Accessed December 2011

[4] www.gseb.com/guvnl/PDFFiles/Annual%20Report%202005-06.pdf , page 11, Accessed January 2012

BPL consumers who were unable to take connection to various reasons. This has resulted in better synchronization with the RGGVY objectives. Service delivery system is better structured. Gujarat state's DISCOMs have established healthy profit and loss account. Since few years their profit before tax (PBT) is in black. With this they have been able to develop positive credibility with loan disbursing institutions. The nationalized banks located in Gujarat are providing loan to DISCOM at lower rate than REC. The loan off-take from REC Gujarat office has been lower than the sanction. Currently (2011-12) REC provides loan at the rate of generation projects 12.5% for 3 years and 12.75% for 10 years, and transmission projects 12.25% for 3 years and 12.50% for 10years. During survey, teams were appraised that some banks are providing loan at as low an interest of 9.75%. DISCOMs are also using loan from bank to finance projects under Jyoti Gram Yojana and other projects related to rural electrification.

Chapter 2: Rural Area and Remote Village Electrification Programme under RGGVY

As per 2001 census there were 18065 villages at different state of electrification. Table 2.1 gives the status of village Electrification in Gujarat as on 31-3-07. As per last record available during survey, 18019 were electrified in the state. However, in remaining 46 Villages, electrification process have been found non-feasible and could not be electrified conventionally due to their location in the areas that is submerged, and areas having no population that are located in the thick/reserved forest and population has migrated and re-located.

Table 2-1: Status of village Electrification in Gujarat as on 31-3-07 (Updated during Survey)

No.	Particulars	Nos.	Remarks
1	Total In habited Villages	18065	18538-473(Un in-habitated)
2	Total Electrified Villages	17986	18019
2(i)	Electrified by conventional grid	17853	
2(ii)	Electrified by Solar home lights	99	
3	Balance Un Electrified Villages as per definition of village electrification Abstract of 79 nos. is given below	35	46
3(i)	Un electrified due to **submergence**	18	**No programme**
3(ii)	Un electrified due to **Migration**	4	**No programme**
3(iii)	Un electrified due to no response	0*	Covered under RGGVY
3(iv)	Un electrified because of non feasible nature due to situated in deep water	3	Covered by GEDA for electrification by non-conventional method.
3(v)	Un electrified because of non feasible nature due to situated in forest	10	

A separate programme is being implemented by the Ministry of New and Renewable Energy (MNRE) for electrification of remote villages. The programme of electrification of remote villages is guided by the Gujarat Urja Vikas Nigam Limited (GUVNL), Vadodara and is being implemented by GEDA. The remote villages have been electrified by providing solar home system [consisting of 9w CFL, 37 Wp module, 12V, 40Ah battery, charge controller etc]. The Sh iyalbet project is one of the examples. GEDA has been executing electrification of un-electrified villages/Peta Para as per the information and list obtained from GUVNL for electrification by solar lighting.

Under RGGVY projects works are required to be carried out on turnkey contracts basis. In the 10th plan projects, as per the quadripartite agreement made with the Government of Gujarat, REC Ltd., M/s. PGCIL, and Distribution Companies; M/s. PGCIL was appointed as turnkey agency for Bharuch and Narmada districts. In 11th plan, agency for turnkey work is selected from the open tender basis; followed in other 23 districts. The lists of turnkey contractors for the districts are highlighted in Annexure E.

With the progress of transmission network, the remote villages are also being provided with power from the state grid that was previously un-electrified. The RGGVY task in the surveyed villages in Gujarat commences with 11 KV line from the substation. Augmentation of substation was not noticed in the surveyed villages. The RGGVY work planning starts with preparation of detailed project report (DPR). The DPR is being prepared by DISCOM and is updated by turnkey contractor with the feedback from village survey. As DISCOMs had prior experience of rural electrification, hence the information and assumptions in the DPR is comprehensive, plausible and accurate. The DPR available is in micro-soft excel sheet, hence it has only included bill of materials/ bill of quantities for village infrastructure and the Block-wise Village-wise details of electrification of rural households, BPL households and public services. The guideline for material quality and project implementation was discussed, and they provided a document part of which is copied in Annexure B. For the project purpose, study of the DPR was conducted, and specific activities in this regard were conceptualized for the project. The DPR have detailed Rural Households (RHH) Electrification (Including BPL Households)), Below Poverty Line Households (BPL HH) Electrification, Electrification of Public Places/services was indicated accurately, to facilitate subsequent connectivity. There is the requirement of having BPL lists which are not readily available, in respect of giving BPL connections. The BPL list should be made available by the DPR making agency in time The Gujarat state SERC and the state energy department also guide the power planning, linkage to sources of power, and actual/projected power demand in consultation with GUVNL, and prudent allocation of power is provided to DISCOMs. Structured review of power demand and supply position is periodically conducted, and power shortfalls are envisaged in advance to plan power purchase. The additional power purchase is requisitioned from power exchange in advance. The overall T&D network is augmented to provide electricity to the rural areas along with the provision for sustaining industrial demand. The technical infrastructure commissioned and progresses made in the state of Gujarat to expand electricity connection to rural population over the years in the state are indicated in the table 2.2. Currently the transmission network in the state Gujarat has been

strengthened by adding 400 KV and 220 KV transmission line. The table 2.3 below indicates the infrastructure and inventory managed by GETCO

Table 2-2: Transmission Infrastructure in Gujarat

Sr. No.	Voltage Class	No. of Sub Stations	Length of Line in Ckms.
1	400 KV	11	2653
2	220 KV	74	12664
3	132 KV	48	4781
4	66 KV	1056	20538
TOTAL		1189	40636

The DISCOMs interfaces with GETCO network to service the demand of multiple consumers in the urban and rural areas are coordinated by GUVNL. DISCOMs have created over the years following infrastructure and inventories to create their own network that include needed facilities in providing electricity to rural areas.

Table 2-3: The infrastructure and Asset managed by the DISCOMs

	11 KV Feeders		Distribution Transformers		400 V
Year	Numbers	Length Ckm	Numbers	Total KVA	Length Ckm
2008-09	9567	223701	351644	23988875	264343
2009-10	10203	232372	398842	25278564	276731
2010-11	10767	239152	436549	26219786	280847

The RGGVY programme for electrification of villages, which is managed by the DISCOMs, is to provide REDB and VEI in the villages. In Gujarat State, it is to mention that all villages are electrified as per new definition since long back, hence the DPRs covers for providing infrastructure for releasing new connection to scattered households only, which include DTs, LT line and service connection to BPL consumers. There is visible operational harmony between DISCOMs[5] and GETCO to ensure backward linkage for RGGVY infrastructure to obtain quality power from the state grid.

The REC while assigning the project "Evaluation of RGGVY programme in the state of Gujarat" had identified the following villages referenced by Blocks (Talukas) in five districts. The districts (referenced by DISCOMs) are the Anand (MGVCL), Sabarkantha (UGVCL), Kutchh (PGVCL),

[5] DISCOMs as a term is used for MGVCL, PGVCL, UGVCL and SGVCL

Jamnagar (PGVCL) and Rajkot (PGVCL). The lists of villages, referenced with census number, block and the districts are in the table 2-4 below.

Table 2-4: List of the surveyed villages

Name of the District & DISCOM	Name of the Block	Name of the Village (Census Code)
1 KACHCHH (PGVCL) (Eleventh Plan)	Abdasa	1 Budadhro (00069000)
	Bhuj	2 Vadvara (00042000)
	Lakhpat	3 Naredo (00006400)
	Mandvi	4 Rajda (00084500)
	Nakhatrana	5 Naranpar (00060000)
2 ANAND (MGVCL) (Eleventh Plan)	Anklav	1 Devapura (01078500)
	Borsad	2 Chuva (01071700)
	Khambhat	3 Tarakpur (01065800)
	Petlad	4 Changa (01058200)
	Umreth	5 Khankhanpur (01051800)
3 JAMNAGAR (PGVCL) (Eleventh Plan)	Dhrol	1 Haripar (00738300)
	Kalyanpur	2 Premsar (00764600)
	Khambhalia	3 Pipriya (00717200)
	Lalpur	4 Khatiya (00757100)
	Okhamandal	5 Padli (00704900)
4 SABARKANTHA (UGVCL) (Eleventh Plan)	Modasa	1 Khumapur (00436800)
	Malpur	2 Bamni (00455400)
	Meghraj	3 Dungragod (00403200)
	Bhiloda	4 Gali Semro (00388100)
	Idar	5 Sabalvad (00360900)
5 RAJKOT (PGVCL) (Eleventh Plan)	Dhoraji	1 Udakiya (00699000)
	Maliya	2 Jajasar (00620100)
	Morvi	3 Haripar (00626500)
	Tankara	4 Otala (00634200)
	Wankaner	5 Pipardi (00645400)
Districts: 5	**Blocks: 25**	**Villages: 25**

Chapter 3: Approach and Methodology of the Study; Broad Information and Observations.

The research project was designed on the basis of analysis of Terms of reference (TOR) issued by REC, where scope of activities, related to the concerns of REC indicated in TOR, were identified. The subject was discussed at REC headquarters, followed by meeting with Joint Secretary (RGGVY, MOP). The project execution was initiated by submission of the inception report. During the process of discussion with state REC executives the relevant stakeholders for interaction were identified. The stakeholders identified are indicated in the Figure 1 (see chapter 1). The discussions were held with the senior executive of DISCOMs, Gujarat State Electricity Regulation commission and the state energy department. Discussions were held based on the formats prepared for these interactions. The interactions with stakeholders representing the consumers were based on field survey. The survey was carried out on the basis of the sample format prepared for each stakeholder. The stakeholders covered under the survey for information compilation were primarily REC, DISCOMs, Project Implementing Agencies (PIA), sub-contactor, panchayati raj institutions, franchisee or revenue collectors that could be identified, and consumers of the villages to be covered for beneficiary consumers. The sample villages surveyed as assigned by REC in the block /district are indicated in Table 2.4 (see chapter 2).

Multiple stakeholders are involved in the RGGVY implementation so a very structured and detailed planning and implementation strategy is required for the smooth implementation of RGGVY. During the interaction with stakeholders it was observed that coordination issues were of consideration among the stakeholders while implementing the RGGVY. The issues are generally of financial, procedural, managerial (Project management), what kind of work has to be taken under JGY and other schemes of GUVNL, and various other co-ordination challenges. During the study all the issues are discussed in detail with the concerned authorities and it was investigated what strategies were followed to overcome the issues. After all these interactions, the strategies were analyzed in detail to comment the effectiveness of these strategies and to suggest more improvements.

In Gujarat the project work involves feedback from consumers /BPL connections, and sample survey of the work done by PIA that includes few thousand kms of HT line, ten thousand Kms of LT line and few thousand numbers of distribution transformers in the district. Looking at the nature of the work, it requires much more emphasis for issuing contract to turnkey project implementing agency (PIA), inspection of quality of materials, and quality of work. The PIA has to procure materials like poles, conductors and transformers etc. It was observed that it takes time for PIA to find out sub-contractors for erection of infrastructure at site. Some stakeholders expressed that this kind of job can be done by DISCOMs. It will be easier because DISCOMs are

carrying out such work and is having own procurement cell, materials can be procure along with other schemes, which reduces the time for procurement of material and erection of line as in case of PIA. Main constraints will be accounting procedure.

In respect of giving BPL connections, there is the requirement of PIA of having approved correct BPL lists. There were complaints that these lists are not always available. The BPL list should timely be made available by the district authority. Post census 2011 this may be streamlined for the 12th Five Year Plan projects.

To begin the study, relevant data and access procedure of the villages were discussed with the state level CPM, REC, and executives in DISCOMs. They facilitated the process of interaction with relevant stake holders. The preliminary information obtained are listed in table 3-1, which indicates the approved and sanctioned budget and the level of fulfillment as on 30-09-2011 in the districts assigned to IRADe by the REC. The table 3.1 also indicates that REC has approved budget valued at Rs. 360 crores, while till date only Rs. 268 crores have been disbursed. The 10% of the approved sanction is held back as franchisee model is yet to develop and function satisfactorily in the state. The table indicates the fund allocation for RGGVY as per scope of work defined in the DPR villages that had to be surveyed.

Table 3-1: Report B-Status of Approval of RGGVY Projects (District-wise) as on 30-09-2011

S No.	Name of the District	Date of Receipt of DPR	Date of Sanction of Projects Under Implementation	Sanctioned Cost of U.I. Projects (in Rs.Lakhs)	No. of Villages already electrified	No. of connections to BPL Households	Name of Implementing Agency	No. of DTs (Capacity in MVA)
1	ANAND	28-10-2005	05-03-2008	1247	350	43665	MGVCL	25 (0.40)
2	JAMNAGAR	15-11-2005	05-03-2008	1083	670	12615	PGVCL	196 (3.14)
3	KACHCHH	08-11-2005	22-01-2008	1865	867	53355	PGVCL	68 (1.43)
4	RAJKOT	-Do-	05-03-2008	1331	844	19862	PGVCL	632 (12.67)
5	SABAR KANTHA	21-10-2005	22-01-2008	2830	1372	76688	UGVCL	350 (5.60)
TOTAL OF ALL DISTRICTS				36044	17934	955150		3925 (76.11)

One of the objectives of evaluation of RGGVY is to monitor and report on proper use of funds allotted for providing REDB and VEI for village electrification. The process of reporting includes

and covers the implementation schedule, quality of work, and real access of infrastructure to the intended consumers, releasing connection to APL & BPL households and community infrastructure[6]. The research project also included survey that was to check the availability of power supply period to consumers, i.e. when they need the most during the day, evening and night, and reliability of supply. If continuous power supply is not available to the consumers, the necessary steps that can be taken by DISCOMs and their authorities should be suggested. However during survey it was observed that people were getting power for 22 to 24 hours, hence the power supply was meeting their need efficiently. The villagers did not complains about voltage drop.

Brief on RGGVY Implementation in Gujarat (10th and 11th Plan)

The assigned villages in districts surveyed, are the project undertaken in eleventh plan. The villages surveyed were already having infrastructure for service lines hence only connections are released by laying service line only. The existing infrastructure was extended to strengthen existing network and releasing BPL connection. The extended infrastructure helped in allocation of power to new APL consumers also. The current status of the implementation, without APL connections, is indicated in the table 3.2 below.

Table 3-2: Project wise achievement of electrification of villages and household und the 11th Five Year Plan in the state of Gujarat

			Achievement (ach) 2011-12		Cumulative achievement till 30-11-2011				
sl no	District in the state	PIA	EV	BPL HH	EV	RHH Including BPL	BPL HH	No of SC/ST BPL HH	% ach of BPL HH wrt BPL HH
GUJARAT									
1	Anand	MGVCL		329	296	27013	27013	1834	100
2	Jamnagar	PGVCL	340	1988	670	12806	12806	3132	100
3	Kutchh	PGVCL	407	5861	523	33972	33972	7732	102
4	Rajkot	PGVCL	501	3107	827	20166	20166	2764	102
5	Sabarkantha	UGVCL	8	711	1372	37313	37313	9663	100

The table 3-2 may not depict the progress of RGGVY project in compliance of data in the context of table 13. This is because part of the work (providing connection to BPL households) is shared

[6] "It will also facilitate delivery of modern health care, education and application of information technologies. This is aimed at accelerated rural development, employment generation and poverty alleviation." As stated in rural electrification plan; Rajiv Gandhi Grameen Vidyutikaran Yojana; page 2; http://www.powermin.nic.in/whats_new/pdf/Rajiv_gandhi.pdf; Accessed January 2012

under Jyoti Gram Yojana also. The GUVNL provided the progress report of RGGVY scheme in Gujarat at each DISCOM. The DISCOM executives maintained that they completed, according to the schedule specified, for the 11th Five Year Plan in 18 months. In few villages wherever contact was established, the statement was verified from the completion report issued by Panchayat.

Table 3-3: DISCOMS and their reached targets and the cumulative progress up to October 2011

Sr. No.	Name of DISCOM / (No of Districts)	Zero Date of Project completion	Target Date of Project completion	Particulars	Total Target as per revised DPR	Cumulative Progress up to Oct - 2011	Remarks
1	DGVCL (6 Numbers)	2006-07 to 2009-10	2008-09 to 2011-12	BPL H/H	198193	161494 (-81%)	Project of 2 District completed Work for other District is in progress
				HT Line	263	131 (50%)	
				LT Line	2321	1446 (59%)	
				Transformers	524	385 (67%)	
2	MGVCL (5 Numbers)	2007-08 to 2009-10	2007-08 to 2011-12	BPL H/H	236893	198084 (84%)	Project of 1 District completed Work for other District is in progress
				HT Line	256	143 (56%)	
				LT Line	2583	2037 (79%)	
				Transformers	277	296 (107)	
3	PGVCL (8 Numbers)	2008-09 to 2009-10	2010-11 to 2011-12	BPL H/H	247417	158127 (-64%)	Work for District is in progress
				HT Line	661	410 (-62%)	
				LT Line	2337	1695 (73%)	
				Transformers	1484	1513 (102%)	
4	UGVCL (6 Numbers)	2008-09 to 2009-10	2010-11 to 2011-12	BPL H/H	125500	131444 (105)	Work for District is in progress
				HT Line	209	160 (77%)	

				LT Line	2830	2390 (84%)	
				Transformers	257	238 (93%)	
	GUVNL (25 Numbers)	2007-08 to 2009-10	2010-11 to 2011-12	BPL H/H	808003	649149 (80%)	Project of 3 District completed Work for other District is in progress
				HT Line	1388	845 (61%)	Expected to be completed by Dec - 2011
				LT Line	10071	7568 (74%)	
				Transformers	2542	2432 (94)	

Table 3.3; highlights the state of achievement in rural electrification in each DISCOMs till October 2011. The surveyed villages indicated good picture of rural electrification. Hence the table was used to analyse the progress

Implementation and Quality of Infrastructure

In the process of survey and overall checking of infrastructure, with the available drawings it was found that the village distribution infrastructure has been created more or less as per the DPR. The installed transformers were found to be in good condition. The rigorous three tier quality monitoring has worked as expected, but it appeared that it took time to implement their suggestions. In the state of Gujarat Medhaj Techno Concepts Ltd is assigned for the National Quality Monitoring. The, Regional Quality Monitoring is being done by Voyants Solutions. PIA is managing quality issues with REC Power Distribution Company Ltd. (RECPDCL) and Electrical Research and Development Association (ERDA).

Chapter 4: Observations of Field Survey

The field survey was designed on the basis of submitted and approved questionnaires to cover technical issues, and social issues. The technical task was done on visual inspection. The social issues were done with interaction with consumers and important stakeholder. Visual inspection was done of distribution transformer, transformer housing, 11 KV HT Lines, LT circuit line, BPL Kits, poles with stay cables, conductor cables, meters, lightening arrestor, earthing pits (not visible), insulators etc. Based on the data of the transformer burning, it appears earthing pit issue should be checked technically by the monitoring agencies. The quality of infrastructure installed found to be satisfactory, although there are few cases of no use of lighting arrestor and improper installation of meters. It was observed that rectification of these discrepancies takes time although the defects are very minor in nature. So there should be a speedy way of rectifying the defects so that incoming problems can be avoided. The overall cooperation received from DISCOM during survey is very good, and the organizational discipline appeared to be good. In view of satisfactory observations and to enhance the overall performance of DISCOM and motivation of employees for further reduction of AT & C losses, reduction of transformer burning in rural areas, a "Total Quality Management" system may be designed for DISCOMs personnel and be implemented. The regular maintenance arrangement for the rural electrification infrastructure has been established. The franchisees are being deployed. The manpower has been allocated and the stores and spares are being maintained properly.

Table 4-1: Information of RGGVY status (Infrastructure) in Surveyed Villages in Anand District

Sr. No. (Village)	Name of habitation (Hamlet/Dhani/Majra/Kara/Dalit Basti)	Census Code (2001)	Proposed No. of connections and connected load & LT line						Work completed			
			Domestic (Other than BPL)		Domestic (BPL)		Configuration (1-Ph., 3-Ph. Etc.)	Length of LT Lines	Domestic (BPL)		Configuration (1-Ph., 3-Ph. Etc.)	Length of LT Lines
			No	KW	No	KW		Kms	No	KW		Kms
1	Khankhanpur	01051800			29	1.16		0.285	30	1.16		0.285
2	Changa	01058000			117	4.68	1-Ph	0.4	111	4.68	1-Ph	0.4

3	Tarakpur	01065800			32	1.28	1PH	0	32	1.28	1PH	0
4	Chuva	01071700			17	0.68		0	17	0.68		0
5	Devapura	01078500			12	0.48		0.36	3	0.48		0.36

In most of the villages 3 phase supply has been provided. This facilitates in better load balancing. The table 4.1, 4.3, 4.5, 4.7, and 4.9 indicate the infrastructure erected in the villages in the district of Anand, Kutchh, Jamnagar, Rajkot and Sabarkantha respectively. In the district of Sabarkantha National Quality Monitor had inspected the villages. The UGVCL executives mentioned that the defects identified by them had been rectified. The quality of infrastructure was in good condition and the task had been done as directed by the DISCOM executive. The Gram Panchayats have also issued completion certificate. The actual connectivity issued was checked with both DISCOMs and consumers (BPL). DISCOM[7]s mentioned all connections have been released. The all consumers, who could be contacted, ascertained that they received connection. The details are indicated in table 4.2, 4.4, 4.6, 4.8 and 4.10 for district of Anand, Kutchh, Jamnagar, Rajkot and Sabarkantha respectively.

Table4-2: Information of RGGVY status (Social) in Surveyed Villages in Anand District

Sr. No.	Name of village	DPR Provisions		Actual released		Surveyed			Disconnection due to nonpayment of Bills		
		BPL	APL	BPL	APL	BPL	Other BPL[8]	APL	BPL	Other BPL	APL
1	Devapura (01078500)	12	0	3	0	3 (100%)	12	18	0	0	0
2	Chuva (01071700)	17	0	17	0	10 (59%)	6	18	1	0	0
3	Tarakpur (01065800)	32	0	32	0	18 (56%)	7	13	1	0	0
4	Changa (01058200)	117	0	111	0	64 (57%)	0	22	3	0	0
5	Khankhanpur (01051800)	29	0	30	0	27 (90%)	0	13	4	0	0

Table 4-3: Information of RGGVY status (Infrastructure) in Surveyed Villages in Kutchh District

[7] DISCOMs mean UGVCL for Sabarkantha, MGVCL for Anand, and PGVCL for Kutchh, Jamnagar, and Rajkot

[8] The other BPL means that the connections released not in RGGVY but in other schemes and they were surveyed.

KUTCHH													
		Proposed No. of connections and connected load & LT line								Work completed			
		Domestic (Other than BPL)		Domestic (BPL)		Total infrastructure to be provided				Domestic (BPL)	Total infrastructure provided		
Sr. No. (Village)	Name of habitation (Hamlet/Dhani/Majra/ Kara/Dalit Basti)	No	KW	No	KW	Domestic	HT Line in Kms	LT Lines in Kms	Dist. T/C in KVA	No	HT Line in Kms	LT Lines in Kms	Dist. T/C in KVA
1	Budadhro (00069000)	0	0	4	0.16	4				4			
2	Vadvara (00042000)	0	0	1	0.04	1				1			
3	Naredo (00006400)	0	0	1	0.08	1				1			
4	Rajda (00084500)	0	0	1	0.12	1		0.04		1		0.04	
5	Naranpar (00060000)	0	0	1	0.08	1				1			

Table4-4: Information of RGGVY status (Social) in Surveyed Villages in Kutchh District

Sr. No.	Name of village / (Census Code)	DPR Provision		Actual released		Surveyed			Disconnection due to nonpayment of Bills		
		BPL	APL	BPL	APL	BPL	Other BPL	APL	BPL	Other BPL	APL
1	Budadhro (00069000)	4	0	4	0	4	0		0		
2	Vadvara (00042000)	1	0	1	0	1	0		0		
3	Naredo (00006400)	1	0	1	0	1	0		0		
4	Rajda (00084500)	1	0	1	0	1	0		0		
5	Naranpar (00060000)	1	0	1	0	1	0		0		

In the villages serviced by the Paschim Gujarat Vij Company limited, the workload for RGGVY programme was comparatively low.

Table 4-5: Information of RGGVY status (Infrastructure) in Surveyed Villages in Jamnagar District

JAMNAGAR													
		Proposed No. of connections and connected load & LT line								Work completed			
		Domestic (Other than BPL)		Domestic (BPL)		Total infrastructure to be provided				Domestic (BPL)	Total infrastructure provided		
Sr. No. (Village)	Name of habitation (Hamlet/Dhani/Majra/ Kara/Dalit Basti)	No	KW	No	KW	Domestic	HT Line in Kms	LT Lines in Kms	Dist. T/C in KVA	No	HT Line in Kms	LT Lines in Kms	Dist. T/C in KVA
1	Haripar (00738300)			2	0.05	2		0.036		2		0.036	
2	Premsar (00764600)			13	0.65	13		0.2		13		0.2	
3	Pipriya (00717200)			8	0.8	8				8			
4	Khatiya (00757100)			9	0.9	9				9			
5	Padli (00704900)			7	0.35	7				7			

Table4-6: Information of RGGVY status (Social) in Surveyed Villages in Jamnagar District

Sr. No.	Name of village / (Census Code)	DPR Provision		Actual released		Surveyed			Disconnection due to nonpayment of Bills		
		BPL	APL	BPL	APL	BPL	Other BPL	APL	BPL	Other BPL	APL
1	Haripar (00738300)	2	1	2	1	2		1			
2	Premsar (00764600)	13	0	13	0	13					
3	Pipriya (00717200)	8	0	8	0	8					
4	Khatiya (00757100)	9	0	9	0	9					
5	Padli (00704900)	7	0	7	0	7					

In surveyed villages of PGVCL area; it is observed that the left out beneficiaries for electrification to be covered under RGGVY programme are very few under BPL category and APL category. No incidences of disconnection in surveyed villages are found at

present. Almost all villages are having the adequate infrastructure available to cater the marginal load due to new connections covered under RGGVY programme. Tail end villages are also connected with JYOTI GRAM feeder for providing continuous power supply. Surveyed BPLs are actually found connected and workmanship is also found as per the guide lines of REC. Proper record is found maintained right from sub division level to corporate level.

Table 4-7: Information of RGGVY status (Infrastructure) in Surveyed Villages in Rajkot District

RAJKOT													
		Proposed No. of connections and connected load & LT line								Work completed			
		Domestic (Other than BPL)		Domestic (BPL)		Total infrastructure to be provided				Domestic (BPL)	Total infrastructure provided		
Sr. No. (Village)	Name of habitation (Hamlet/Dhani/Majra/ Kara/Dalit Basti)	No	KW	No	KW	Domestic	HT Line in Kms	LT Lines in Kms	Dist. T/C in KVA	No	HT Line in Kms	LT Lines in Kms	Dist. T/C in KVA
1	Udakiya (00699000)			2	0.05	2				2			
2	Jajasar (00620100)			21	2.1	21				21			
3	Haripar (00626500)			5	0.125	5				5			
4	Otala (00634200)			3	0.075	3				3			
5	Pipardi (00645400)			1	0.05	1				1			

Table4-8: Information of RGGVY status (Social) in Surveyed Villages in Anand District

Sr. No.	Name of village / (Census Code)	DPR Provision		Actual released		Surveyed			Disconnection due to nonpayment of Bills		
		BPL	APL	BPL	APL	BPL	Other BPL	APL	BPL	Other BPL	APL
1	Udakiya (00699000)	2		2		2					

2	Jajasar (00620100)	21		21		21					
3	Haripar (00626500)	5		5		5					
4	Otala (00634200)	3		3		3					
5	Pipardi (00645400)	1		1		1					

Table 4-9: Information of RGGVY status (Infrastructure) in Surveyed Villages in Sabarkantha District

Sr. No. (Village)	Name of habitation (Hamlet/Dhani/Majra/Kara/Dalit Basti)	Proposed No. of connections and connected load & LT line								Work completed			
		Domestic (Other than BPL)		Domestic (BPL)		Total infrastructure to be provided				Domestic (BPL)	Total infrastructure provided		
		No	KW	No	KW	Domestic	HT Line in Kms	LT Lines in Kms	Dist. T/C in KVA	No	HT Line in Kms	LT Lines in Kms	Dist. T/C in KVA
1	Khumapur	5	0.2	19	0.76	24	0	0.96	0	19	0	0.08	0
2	Bamni	4	0.16	45	1.8	49	1.91	2.31	1	45	0.12	2.31	1
3	Gali Semro	2	0.08	32	1.28	34	1.91	9.31	1	130	1.91	9.31	1
4	Dungragodh	12	0.48	31	1.24	43	0.84	1.29	2	32	0.84	1.29	2
5	Sabalvad	6	0.24	16	0.64	22	0	0.88	0	8	0	0.88	0

In Madhya Gujarat Vij Company limited many BPL connection were provided by the state fund.

Table 4-10: Information of Surveyed Villages (Social) in Sabarkantha District

Sr. No.	Name of village / (Census Code)	DPR Provision		Actual released		Surveyed			Disconnection due to nonpayment of Bills		
		BPL	APL	BPL	APL	BPL	Other BPL	APL	BPL	Other BPL	APL
1	Khumapur (00436800)	19	0	19	0	16 (84%)	0	18	0	0	0
2	Bamni (00455400)	45	0	45	0	37 (82%)	4	12	1	0	0
3	Dungragod (00403200)	32	0	32	0	30 (94%)	0	8	0	0	0
4	Gali Semro (00388100)	130	0	130	0	44 (34%)	1	8	0	0	0
5	Sabalvad (00360900)	8	0	8	0	8 (100%)	0	34	0	0	0

The DISCOM executives informed that infrastructures do not require for augmentation for giving new connection to APL households. Proper care is taken by DISCOM for augmentation of

transformer whenever required. They monitor the load on the transformer periodically, when load increased beyond optimum level, action is initiated. Regarding releasing of new connections in case of A category (i.e. LT line available near the house), they get connections within 30 days on applications; hence there are no more pending connections. For new connections, meter replacement, change of name and other customer services; for that the Standard of Performance (SoP) has been set by GERC, and accordingly the services are provided to consumers by DISCOMs.

All categories of connections, other than HP based un-metered agriculture connections released prior to 10.10.2000, are metered (refer to the table 4-11). From 10.10.2000 onward, all new agriculture connections are being released under metered tariff scheme. Whereas for HP based un-metered agriculture connections released prior to 10.10.2000, meters are being provided. The State Commission has directed DISCOMs to complete the work of installation meters in phased manner. The task is in progress. However the available data indicates that only 40.4% of the agriculture pump sets are metered. The ESCo modalities suggested by Bureau of Energy Efficiency may be explored.

Table 4-11: Status of Metering at the interfaces of consumers electrification in Rural Areas

Sr.No.	Type of consumers		Number of Meters	Metering %
1	Domestic (BPL)		8640876	100
1A	Domestic (APL)			
2A	Agriculture: Irrigation pumps	(Metered)	345547	
2B		(Un Metered)	508971	
2C	Total Irrigations Pump		854518	40.4
3	Commercial		1235691	100
4	Small Scale Enterprises		201228	100
5	Others		67912	100
TOTAL			11000225	

Evaluation of RGGVY implementation

The DISCOMs were enquired about the progress made in the districts assigned by REC for evaluation. The information received in highlighted in Table 4.12. The evaluation of RGGVY implementation in the state of Gujarat is complex as parallel schemes are in operation. For example, in the district of Anand, the BPL HHs which are covered under RGGVY programme is 52%, in Anand district (Table 4-12), while during survey majority/ all BPL were having electrical power connection. Many of these were covered under Jyoti Gram Yojana (JGY). The states DISCOMs have used the funds prudently. REDB in villages surveyed, in most of the surveyed

villages the projects has been executed properly as per the DPR. Coverage of village electrification infrastructure was found to be very good.

Table 4-12: The targets as per revised DPR and the achieved results up to October 2011

Sr. No.	District	Particulars	Total Target as per revised DPR	Progress up to Oct - 2011	% achieved	Remarks
1	Anand	BPL H/H	43665	22503	52%	Approval for left out BPL H/H by REC on 24/08/2011. Survey team were appraised that part of BPL were covered under JGY
		HT Line	13	24	**194%**	
		LT Line	240	138	58%	
		Trans.	25	43	**172%**	
2	Sabarkantha	BPL H/H	29000	28481	98%	Time limit extension up to Nov 11 is approved by REC on 04/10/2011
		HT Line	137	123	90%	
		LT Line	1185	994	84%	
		Trans.	171	175	**102%**	
3	Jamnagar	BPL H/H	17835	9972	56%	Balance work to be completed by Nov - 2011
		HT Line	40	24	60%	
		LT Line	189	103	55%	
		Trans.	108	111	**103%**	
4	Kutchh	BPL H/H	48595	29496	61%	Balance work to be completed by Nov - 2011
		HT Line	215	88	41%	
		LT Line	568	353	62%	
		Trans.	332	192	58%	
5	Rajkot	BPL H/H	26567	16561	62%	Balance work to be completed by Nov - 2011
		HT Line	57	23	41%	
		LT Line	241	143	59%	
		Trans.	173	185	**107%**	

In 25 sample villages surveyed under the project; 297 numbers of APL and 356 numbers of BPL households (HH) have been surveyed (see Table 4-13). Identification of BPL households in villages was taking a lot of time. There were delays in getting the BPL list from the local authorities. This has also created hindrance for expediting the release of BPL connections by PIA. However there are other schemes of Government of Gujarat for Rural / Tribal area and Peta-paras electrification which are running other than RGGVY. It was difficult to identify the source of connection. The various schemes details are highlighted at Annexure A.

Table 4-13: Incidence of disconnection in BPL Household

DISCOMs	Total Surveyed		Disconnection		Disconnection in %
	BPL	APL	BPL	APL	BPL
MGVCL	154	73	9	0	5.8
UGVCL	100	80	1	0	1.0
PGVCL	102	144	0	0	0.0
TOTAL	356	297	10	0	2.8

Very few BPL / APL households Electricity connections are pending, some of them are residing outside the perimeter of villages, and some of them are residing in their own farms. For connecting them additional infrastructure is needed. May be they have to pay for their additional transformers in addition to LT Lines.

Disconnection of BPL households was noticed in the villages surveyed (Refer table 4-14). The average 2.8% disconnection was noticed, and the value was between 0% and 5.8% in some of the villages. The disconnections are due to nonpayment of bills and the vigilance actions. There are cases of dis-connection in the tribal area due to non-payment of bills[9]. These connections are normally restored under some scheme or the other of the state government. Considering the disconnection depended on profile of BPL family data, information of other districts were also collected. Disconnection of consumers information of UGVCL is indicated in Table 4-14

Table 4-14: Disconnection of Consumers (UGVCL)

Name of Circle	Numbers of Consumers as on March 11		Numbers of Consumers disconnected as on March 11		% Disconnections	
	1 φ	3 φ	1 φ	3 φ	1 φ	3 φ
Sabarmati	617124	49443	26801	3783	4.3	7.7
Mahesana	600557	38343	15954	2004	2.7	5.2
Palanpur	606436	396270	15743	11740	2.6	3
Himatnagar	439689	207961	6834	2756	1.6	1.3
TOTAL UGVCL	2263806	692017	65332	20283	2.9	2.9

The typical disconnection rate at DISCOM level is shown in the table 4-14. The disconnection for 3 phase connection is higher. This is also due to nonpayment of bills by consumers.

[9] Discussed with DISCOMs

The Government of Gujarat has taken various initiatives for 24 x 7 power supply in rural area villages by segregating rural (agriculture) load and laying separate feeders (Jyoti Gram feeders) for villages only. They have ensured that agriculture feeders are supplied with electricity for 8 hours per day in rotation. The care has been taken for catering to the village load during the process of supply to agricultural pump-set. Domestic and commercial load was serviced all the time during the day. No transformer was found to be over-loaded during the survey.

There are very few APL consumers left for getting new electricity connections. The load demand for new connection of APL consumer is very less. They get connection in a short period (one month in case of A category connection). The load considered in the DPR is 0.04 KW for BPL connections at the time of preparation of DPR, while we observed during the survey that the load of BPL household varied in the range of 0.1 KW to 0.3 KW. Additional load was observed in the houses which are having water pumps.

Development and implementation of District level DPRs:

DISCOMs in Gujarat had been maintaining existing rural electrification infrastructure, hence they had near accurate information on baseline data of village level electrification. However the inconsistency was faced during estimating BPL connections and conducting survey. DPR can be made more accurately and upgraded with prior proper survey and current availability of census data (2011). Few flippant comments were heard about political intervention in providing BPL cards. In most cases on visual observation they appear to be genuine BPL card holders. The emphasis in the twelfth plan should be on economic development in rural area. There are blanks in the column (Commercial, Agriculture, Small Industries, Others (Street Light.) in D5 worksheet) of D5 worksheet. Gujarat DISCOMs can get this data in their state development plan for say five years. In Bhuj distribution circle DPR does not present proper picture. The Gujarat's DISCOMs are revamping their electricity infrastructure, and GEDA is very active in renewable energy. This will provide good opportunity for developing DDG project that can be linked to state Grid. The GUVNL can co-ordinate between its subsidiary DISCOM and GEDA to establish a pilot project, where an integrated approach to DPR preparation can be taken up. This will feature by developing a scheme of REDB with smart grid provision and DDG for a cluster of villages in future. In the first project DDG franchisees and project implementing agency can work together. The first DPR preparation cost can be part of RGGVY funding. Even the Gujarat government can fund some of such DPRs.

Reference to potential DDG scheme, wind could be a good energy sources in the district of Anand, Jamnagar, Kutchh for proximity to sea. Solar energy can be harnessed in the district of

Sabarkantha and Kutchh (Gujarat state has good solar insolation). Furthermore the Gujarat government is installing a power station in the district of Patan that is adjacent to Sabakantha. Biomass can be used in the district of Anand and Rajkot. The Government of Gujarat can encourage energy plantation in Sabarkantha and its adjacent districts. TERI has submitted a report to Gujarat government on Renewable Energy (RE) potential in the state. Adequate time should be given to prepare DPR. Since the approval of DPR takes long time, while implementing, a survey should be carried out to get the real picture of available power, natural resources, and proper demand estimation of the villages.

During survey the village populations were satisfied with the maintenance support of electricity infrastructure. The DISCOM data indicate that transformer failure in PGVCL appeared to be high. This was not received as feedback during survey, where transformer failure was not responded. The data on transformer failure available from GUVNL is indicated in Table 4-16 for different DISCOM. The transformer failure in the MGVCL is substantially. The transformer failure rate is quite high especially in the Saurashtra and Kathiawad region under PGVCL (see tables below). The reason attributed for transformer failure was (a) aging of the transformer (b) overloading of transformer. Survey team's observation was that adequate maintenance facilities is in place.

Table 4-16: Installed and failed transformer of each DISCOM in rural areas.

Sl. No.	Name of DISCOM	Transformer March 2011	Transformer Failed 2010-2011	Failure in %
1	DGVCL	53493	6996	13.08
2	MGVCL	56177	2792	4.97
3	UGVCL	124128	11171	9.00
4	PGVCL	207297	39006	18.82
	TOTAL	441095	57173	12.96

Table 4.16, 4.17 and 4.18 indicate the transformer failure rate at different circles of DISCOMs where transformer failure rate is comparatively low. The transformer failure rate in rural areas is approximately 2 to 3 times higher than in urban areas. This will reflect in economic viability of rural electrification in future.

Table 4-17: Transformer Failure MGVCL

Sr.No.	Name of Circle	Total Numbers of Transformers	Transformer Failed during 2010 - 11	% Failure of Transformer

1	Baroda (O & M)	16135	873	5.41
2	Baroda City	4498	7	0.16
3	Anand	20177	1094	5.42
4	Godhra	15367	818	5.32
	TOTAL	56177	2792	4.97

Table 4-18: Circle wise Transformer Failure (UGVCL)

Sr.No	Name of C.O.	Dist. Transformer Failure					
		Total Numbers of Trans. Installed		Numbers of Trans. Failed 2010-11		Failure Rate	
		in urban Area	in rural Area	in urban Area	in rural Area	in urban Area	in rural Area
1	Sabaramati	4559	20277	175	1729	3.84	8.53
2	Mehsana	6916	20106	82	1342	1.19	6.67
3	Palanpur	2289	45475	108	5941	4.72	13.06
4	Himatnagar	1208	23298	44	1750	3.64	7.51
	TOTAL	14972	109156	409	10762	2.73	9.86

From the data set and visual survey of the region it appears that some of the reasons for the transformer failure may be due to aging (may be common for all districts). However the other reason may be poor earthing as the tip of earthing pit should be submerged in the wet area. PGVCL appeared to be in the drier area. Hence the depth of earthing pit in this region should be more than those in other areas. Some guidelines may be needed for site selection of transformer installation. Where-ever there are 3 phase transformer installed, periodic load balancing should be carried out.

The quality of work and workmanship of above ground infrastructures including painting were found to be good on visual inspection. All the REDB work and the electrification task in surveyed villages were completed in time. The earthing and lightening arrestor were installed at transformer housing. However some exceptions were visible, such as:

(a) PG Clamps for the transformer at few places were not used.

(b) Stay connection at the pole was loose and earthing wires were broken.

(c) Few poles were tilted.

(d) Few poles were fouling with the trees.

Use of HVDS Distribution

In the entire surveyed villages three phase HVDS mode of distribution has been done, as losses can be reduced through this type of distribution system. Load balancing can be achieved.

Conventionally a nearby 11 KV input is extended to a convenient point in the village. A 16, 25 or 63 KVA transformer would be installed at the point in the village, the transformer output and connection will be extended through three phase LT lines to the consumer periphery. HVDS 11 KV lines are directly extended to as many points as possible in the village, thereby reducing LT lines and power losses due to voltage drop in the network. Use of small transformer of 5, 16, 25 KVA rating is used depending on the demand of consumers. Three phase transformers are installed for industrial and agricultural consumers which are again of smaller rating. Care is taken to ensure that no more than three consumers in general are fed from one transformer. Any LT lines required are drawn using aerial bunched conductors (ABC) which cannot be tapped and possibility of theft completely eliminated.

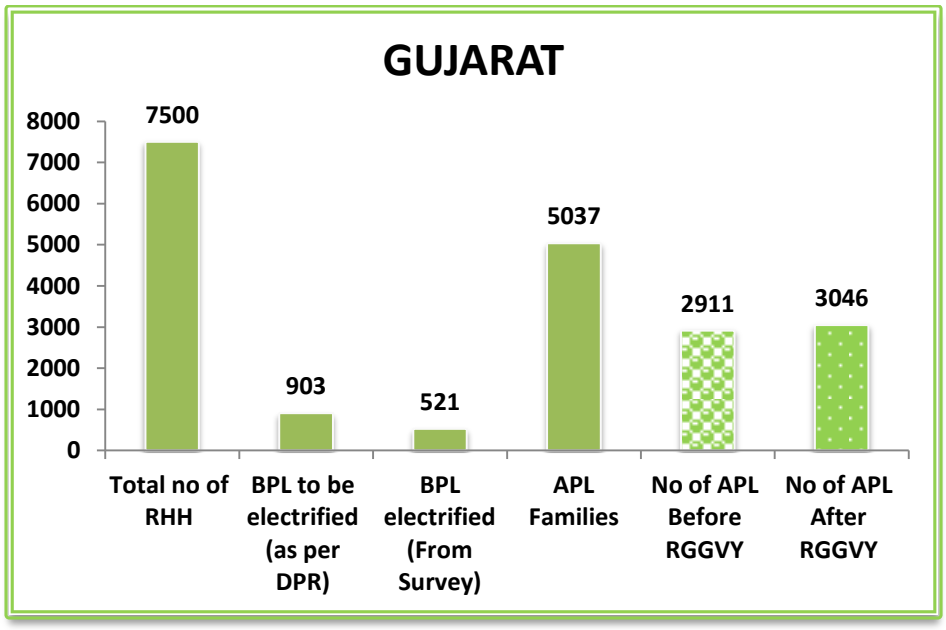


Figure 4.1 Statistics of electrification in the surveyed Villages

The analyses of survey data indicate that 59% BPL households have been electrified under RGGVY. While generally stakeholders maintained complete electrification of BPL households. The difference in perception may be due to (a) it was observed state government scheme is more proactive in Giving BPL connections in IE villages (b) under State government schemes that has been listed in Annexure, large number of BPL connection has been released in all the villages. The government earmarks fund for such scheme periodically.

The implementation time of RGGVY projects in Gujarat has been more than 18 months in all cases, and in Anand and Sabarkantha it has been very high.

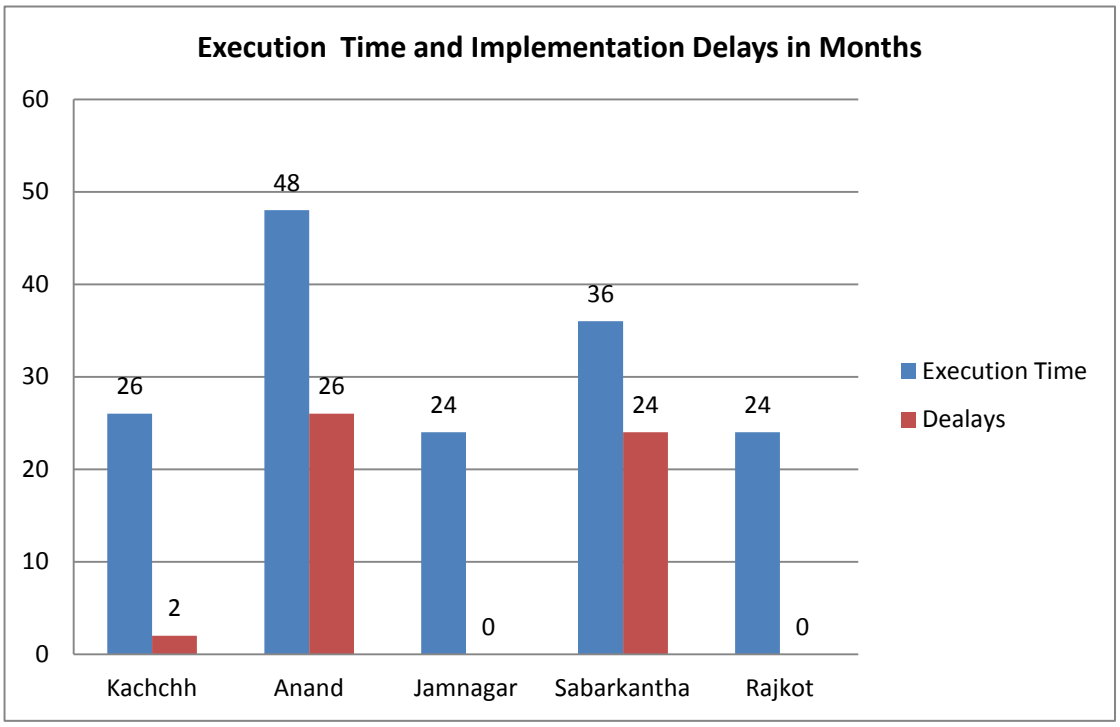


Figure 4.2: District-wise Implementation Statistics (Execution time and Delays based 24 months implementation schedule)

In Gujarat the work involved were focused on providing for BPL connections and little augmentation of REDB. These work are few thousand kms of HT line, ten thousand kms of LT line and few thousand number of distribution transformers only. Looking to the work structure, it required, lot of issuing contracts to PIA and contracts for material procurement for repairs and maintenance; furthermore the PIA also has to procure materials like poles, conductors, transformers etc. It takes time for PIA to find out contractors for erection of infrastructure, though they are located in the state and have good working relation with DISCOM. These jobs can be done by DISCOMs, it will be easier because DISCOMs are carrying out such work; and are having their own procurement cell. Materials can be procured along with other schemes, which reduce the time for procurement of material and erection of line as in case of PIA.

The manner of implementation of DPR whether through a turnkey Contract or through few separate Design/ supply/ execution (work) contracts could be left to DISCOM/SE (Distribution circle) to improve the effectiveness of implementation. The DISCOMs executives felt that Turnkey basis of entering into implementation contracts by PIAs may be changed to work contracts designed by DISCOM/EDCs to effect economy and quality work. The small projects should be handled at electricity distribution circle (EDC). And EDC can be designated as cost & profit center as is the case in other projects. The task of enhancing infrastructure of already electrified villages may be budgeted on a yearly basis and put-up as a case of addition/ modification/ renovation scheme under electricity distribution circle and compiled for each DISCOM. The schemes can be funded accordingly. There may be some issues in administrative structuring, as RGGVY is a Bharat Nirman programme.

H/H Electrification in Gujarat during Year 2011-12						
Sr. No.	DISCOMs	Total Nos. of H/H Electrified	BPL H/H Electrified Under (Central & State) Govt. Schemes	H/H Electrified Under Normal Development	% (Col 4/ Col 3)	% (Col 5/ Col 3)
1	2	3	4	5	6	7
1	DGVCL	69334	43896	25438	63	37
2	MGVCL	85057	67656	17401	80	20
3	UGVCL	84711	48882	35829	58	42
4	PGVCL	131403	45302	86101	34	66
	TOTAL	**370505**	**205736**	**164769**	56	44

Table 4.19: Household electrification In Gujarat during the year 2011-12

Though during survey response was that Gujarat state has 100% electrification, but large number of electricity connection (3, 70, 505) were release as shown in table 4.19. The point to be noted that major percentage (56%) connection released are under various government sponsored schemes. In Madhya Gujarat Vij Company Limited 80% connections were released. Here it was given to understand that some of RGGVY allocation was diverted to Indira Awas Yojana. It may be noted that that sponsoring scheme by the government for releasing connection to remaining BPL and marginalized population/ household will be needed in future also.

	RHH	No. of APL HHs at the time of Survey	APL connections before RGGVY	APL connections after RGGVY	APL connections released after RGGVY
Rajkot	1037	992	992	1037	45
Kuchchh	240	232	232	232	0
Jamnagar	1676	494	522	577	55
Sabarkantha	1629	1175	1165	1200	35
Total	4582	2893	2911	3046	135

Table 4.20: APL connection statistics in the surveyed Villages.

The table 4.20 indicates the number of connections released after installation of RGGVY infrastructure. The number of connections released were low as in most of the case the villages were already electrified. The new and remaining household were issued connection.

Chapter 5: Socio-economic status in the Surveyed Villages.

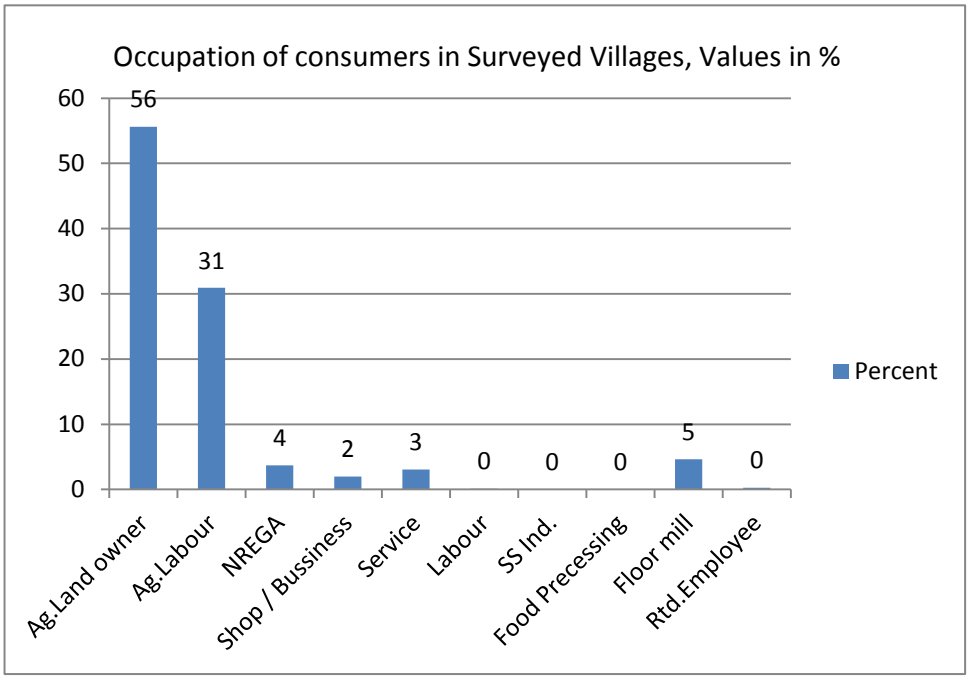
Rural Electrification is a welfare activity of the state in helping improvement of life-style, income and development of economic activities and opportunities of rural population. Gradually the rural populations have to take-up non-farm activities according to their capacity to augment their family income, and also reduce pressure on the land, where average land holding of farmers is diminishing with each generation. The farm yields have to be increased using mechanized farming, and upstream processing of agriculture products. The renewable energy has a potential for rural employment.

The current profile of employment in the surveyed villages that has been computed district wise is indicated in the table 5.1. The surveyed village families primarily depend upon agriculture. Agriculture land-owners and laborers account for approximately 80% of the population.

Table 5.1: Employment Profile

DISCOM	MGVCL	UGVCL	PGVCL			Total	Percent
District	Anand	Sabarkantha	Rajkot	Jamnagar	Katchh		
Ag.Land owner	102	173	50	50	46	421	58.1
Ag.Labour	97	33	31	61	12	234	32.3
NREGA	Few (6 HH completed 100 days and 14 HH working during reporting month)	Few (22 HH completed 100 days and 2 HH working during reporting month)	0	0	0		0
Shop / Bussiness	13	2				15	2.1
Service	10	2			11	23	3.2
Labour	1					1	0
SS Ind.							0
Food Precessing							3.9
Floor mill	7	13	5	5	5	35	0.3
Rtd.Employee		2				2	

No activities like shop / business, small scale industry or food processing for new development were visible in the surveyed villages. Animal rearing for milk production was observed as a source of income in some families. The milk collection centers exist in 18 villages surveyed.



The socio-economic impacts of rural areas are analyzed in the context of information of Financial Status of Rural Consumers and Distribution Utilities, indicated in Table 5.2. The average income was calculated based on income told by the consumers.

Table 5.2: Average Income in Rs. / Annum of the Surveyed Households

DISCOM	Average income in Rupees
MGVCL (Anand district)	19046
UGVCL (Sabarkantha District)	30773
PGVCL(Kutchchh, Jamnagar, Rajkot)	41268
AVERAGE	30810

In the surveyed villages the overall average income assessed was Rs. 30810 per year per household. The BPL consumers are poor and working as agriculture labourers. They are struggling for maintaining their family requirements. The APL consumers are in a better position to provide electrical amenities themselves, and take benefits of the electrification.

Almost 100% households accepted that it is more comfortable and secure to live in the village after the village got electrified.

No respondents admitted that they got employment due to electricity or RGGVY.

About 1% (few) of respondents did accept the increase in income due to the use of electricity in activities such as weaving, tailoring, running kirana shop, and other household based small

business activities. All families felt that their health has improved. They agreed that they got some relief from intense heat during summer.

There is awareness among BPL families that they got electricity connection free of cost under RGGVY. It is noticed that some BPL have got connection in Zuppad patti yojana of Gujarat Government where the applicant has to pay only registration charges of Rs. 50 individually and after approval for other line charges from Government. They all perceived that all the facilities concerning electrification were being provided or arranged by the DISCOMs.

Electricity provides an opportunity to improve the quality of life, healthcare, education. Appliances used in sample villages included electric FTL (167), CFL (35), television (183 Numbers), electrical pump (5) and refrigerator (34 Numbers). Other appliances used in sample villages included bulb (592 Nos.), fan (197 Nos.), Computers (2 Nos.), mobile phones (202 Nos.), Air Conditioner (1 No.), electric press (3 Nos.), refrigerator (6 Nos.), heater (2 Nos.), food processor (nil), and grain processor (3 Nos.) are being used in Sampled Villages.

Women empowerment and Electrification of Public Places

Almost all women found the "better management of home" as one of the clear benefits of electricity. It helps them in cooking at night and provides more time during day for other works. Working in evening and night is comfortable and safe. Managing home was cited by 100 per cent women as prime benefit. Their working hours during day as agricultural labour has increased, as they have to spend less time during day hours for cooking and other activities, which now they can do during night hours.

Industrial activities/Commercial activities in Villages

In all the surveyed villages no industrial activities were found. However, at household level small activities were being organized such as weaving and tailoring. Four tailors, running their tailor shops, have motorized their weaving machine. There were no facilities for processing of milk in any of the surveyed villages. Out of 25 villages, 18 milk collection centres were found operational. Villagers did show no interest in setting up small scale industries (SSI) business due to their financial condition, competition and market conditions.

Public facilities in villages

The public utilities, like primary schools are there in all the villages, and they have been provided with electricity. In some villages there are Primary Health Centers (PHC) and high schools. The coverage for PHC facilities is available in all villages. The electricity supply is available for all the utilities and amenities. In the Anand district, Petlad block, is an engineering college.

Table 5.3: Number of electrified facilities in the 25 surveyed villages of Gujarat

DISCOM / District	Primary school	High school	Engg.College	Primary Health Cenre
MGVCL / Anand	13	2	1	3
UGVCL / Sabarkantha	5	1		1
Rajkot	5			
Jamnagar	5			
Katchh	4			1
PGVCL	14			1
TOTAL	32	3	1	5
All above facilities are electrified				

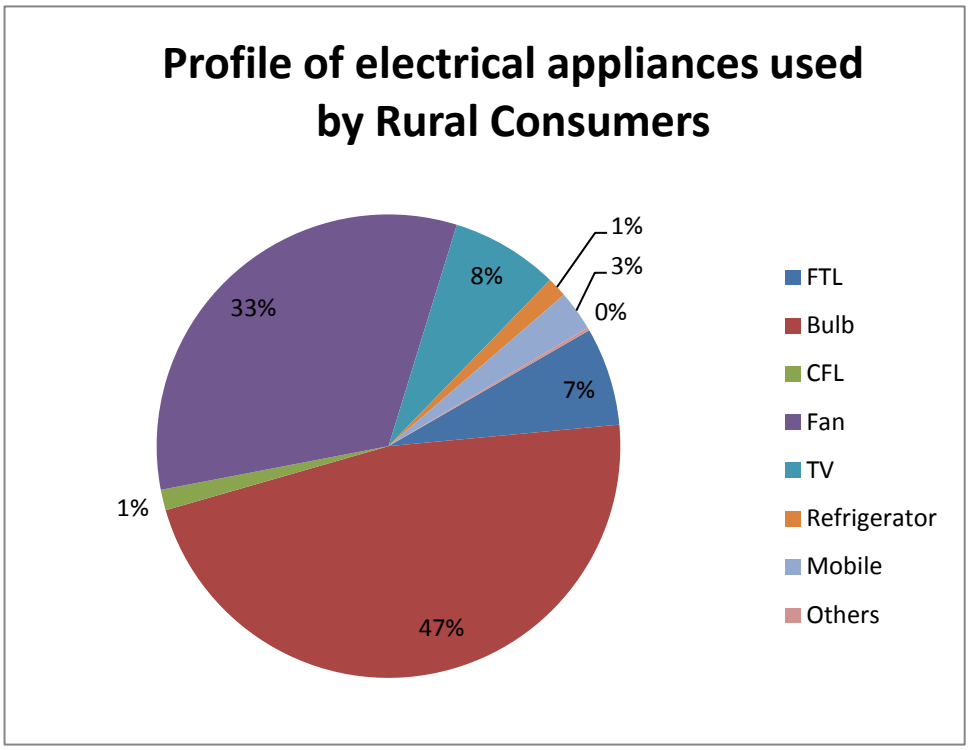
Out of 32 schools in sample villages, all 32 are electrified. Also 2 high schools and 1 engineering college were found electrified. All schools function from 10.30 a.m. to 17.00 p.m., and all the

other public places like Community Centre and Panchayat office were found to be electrified with facilities like FTL, bulbs and fans.

There are also other public places (common places) like Dairy (Milk collection centres, 18 in numbers), which were found electrified in the surveyed villages.

Out of 25 villages in 5 villages Primary Health Centres (PHC) are existing and all places were electrified and having facilities of FTL, bulbs, fans, and in big PHC refrigerators are also provided. Also other places nearby PHCs were electrified with all facilities like FTL, bulbs, fans and refrigerators also. Figure 5.1 indicates the graphical distribution of cumulative electrical appliance distribution in rural areas.

Figure 5.1: Profile of Electrical Appliances used by Rural Consumers



Status of Electricity Supply in Villages

In terms of the responses received it is noticed that in all the surveyed villages all consumers are getting power supply for 22-24 hours. It also comes to the notice that during the fault period, the DISCOMs employees are immediately restoring power supply. It is learnt that the people are getting information of preplanned shut down for maintenance by the concern Divisional Office, through the leading newspapers for the date and shut down period. However in case of power supply for agriculture the consumers get power supply for 8 hours per day in rotation.

Table 5.4: Growth in Consumers in Gujarat

Growth (G) in Consumers in Gujarat				
Sr.No.	Consumer category	2008-09	2009-10	2010-11
1	Domestic (BPL)	7956151	8389200	8640876
2	Domestic (APL)			
1&2G	% Growth in Domestic		**5**	**3**
3	Commercial	1132895	1199700	1235691
3G	%Growth in Commercial		**6**	**3**
4	AGRICULTURE	776160	829630	854519
4G	% Growth In Agriculture		**7**	**3**
5	Industries	189776	195367	201228
5G	% Growth in Industry		**3**	**3**
6	Others[10]	60300	65935	67913
6G	% Growth in Others		9	3
	Total	10011528	10679832	11000227
	% Growth in Total		**7**	**3**

The data of growth at village level could not be ascertained as there was no commercial activity of significance. Hence data was obtained for the state for the growth in consumer profile was obtained. During 2008-2009 to 2009-10 there was significant growth of consumers of every sector (Table 5.4). Agriculture consumers increased by 7%, followed by commercial at 6% and Domestic consumers by 5%. Rural industrial growth is stagnant at 3%.

[10] Others are Public Water works, Street Light, Electric Railways, Military, Licences

Chapter 6: Long term Village Electrification initiative from state/ DISCOMs.

RGGVY has given new emphasis to rural electrification programme by giving incentives of huge investments through REDB and VEI, and insisting on formulating and implementing Rural Electricity Policy and Plan in each State to improve the quality of Life for rural population. The main objective of the Rural Electrification Plan declared in 2007-08, was to draw a road map for rural electrification development in Gujarat and detail how the electrification will be done in rural areas of Gujarat by considering scope of work, the availability of financial and managerial resources like power availability, power system capacity to deliver electricity to the villages (transmission, distribution network), appointment of turnkey contractor, capacity building, funding for project, and budgetary provision for subsidy, management of rural distribution to enable adequate supply of power to villages and proper customer relationship management.

The rural electrification plan has been documented for rural areas Notification No.GU-2006-31-ELA-1105-CS-GoI-19-K dated 31st March-2006. However they have been proactive in undertaking and initiating projects benefitting marginalized population. These are highlighted in Annexure A. However considering the efficiency of the project implementation in Gujarat in comparison to other surveyed states, it may be feasible that GUVNL may review implementation strategy in revised Rural Electrification plan for 12th plan. In this plan emphasis should be on optimizing the resources in view of AT & C Losses, compressing the implementation time, quality management, and integrate with state development plan.

In the order dated 6th September 2011, GERC has provided guidelines and directive to distribution companies to ensure quality power supply with proper voltages to all categories of consumers particularly to consumers at tail end of feeders by providing required reactive compensation. According to the plan following items are specified:

(a) No subsidy is provided to agriculture pump sets[11]

(b) Subsidy prescribed to agriculture consumption is **Rs. 0.50/Kwh**

(c) There is no incentive provided by the state for Decentralized Distribution Generation

(d) Currently the state government has taken initiatives to make investment in REDB and VEI under RGGVY more productive in the field of education. This has been special initiatives.

(e) Subsidy from State for Exploitation of Renewable energy in rural areas is not provided.

The Rural Electrification Plan has in the State through Regulatory interventions, taken care of following issues:

[11] In previous chapter mention of ESCo was made

(a) Cross Subsidy from Other Sectors to Agriculture has been limited

(b) The tariff plan provides marginal difference (40 or 50 paise/ unit) in tariff in favour of rural area over urban areas and BPL connection is provided for first 30 units/ month at the rate of 150 paise.

© Gujarat Electricity Regulatory Commission has fixed a rate of Rs.1920/HP irrigation pump set. The state government is giving power to the farmers at the rate of Rs.665/HP for the consumption of up to 7.5 horsepower and at the rate of Rs.807.50/HP for the consumption higher than that.

(d) Additional Capital investments in Transmission & Distribution to feed rural areas have been provided under the Schemes like TASP (by GETCO), Sagarkhedu & HVDS (KHUSY) by DISCOMs. The schemes are detailed in Annexure A.

The GUVNL has planned for capacity addition in power generation to meet power demand of Industry, domestic consumers, commercial, rural areas in future. The power generation capacity addition will be complemented with transmission network, to sustain quality power supply to the consumers. GSECL is executing / planning implementation of following power projects (table 6.1):

Table 6.1: Planned Power projects in Gujarat

Sr. No.	Name of the Project	Capacity in MW	Fuel	Planned COD
Under Execution				
1	Ukai TPS Unit 6	500	Coal	2012-13
2	Sikka Unit 3 & 4	500	Coal	2012-13
3	Dhuvaran CCPP 3	395	Gas	2013-14
4	Solar Power Plant	1	Solar	December-2011
Under various stages of planning / implementation				
1	Wanakbori TPS Unit 8	800	Coal	2015-16
2	Dholera Power Plant	1600	Coal	2017-18
3	Solar Power Plant	1	Solar	December-2011
	Total	3797		

- The project of GSECL under execution are planned during the 11th Five Year Plan for addition of 1370 MW capacity with outlay of Rs. 6286 Crores and provision of Rs. 400 Crores is made during the year 2010-11. However the project will be completed by 2013-2014 as mentioned above.

- The projects under planning and implementation stages are for capacity addition of 2401 MW and covered under 12th Five year plan.
- In addition to above the power plant of private sectors are also under commissioning / construction stage. The power will be purchased by GUVNL for catering additional future demand of DISCOMs and PPA will be signed accordingly.

TRANSMISSION NETWORK IN GUJARAT

GETCO (Gujarat Energy Transmission Corporation) is a transmission company providing infrastructure for transmission of power in Gujarat state. The sub stations and related lines commissioned during 11th Five Year Plan are listed in table 6.2 and table 6.3 below.

Table 6.2: Gujarat Transmission Network (Number of Subs-station) 11th Five Year Plan (2007-2012)

GUJARAT TRANSMISSION NETWORK 11th FIVE YEAR PLAN (2007-2012)						
Sub Station	As on 31st March 2007	Commissioned during the year				Planning during 2011-2012
		2007-08	2008-09	2009-10	2010-11	
400 KV	9	0	0	0	1	1
220 KV	65	2	4	2	2	4
132 KV	48	0	0	0	0	1
66 KV	758	48	56	58	137	134
TOTAL	880	50	60	60	140	140

Table 6.35: Gujarat Transmission Network (Transmission line in Circuit km) 11th Five Year Plan (2007-2012)

GUJARAT TRANSMISSION NETWORK 11th FIVE YEAR PLAN (2007-2012)						
Transmission line in Ckm.	As on 31st March 2007	Commissioned during the year				Planning during 2011-2012
		2007-08	2008-09	2009-10	2010-11	
400 KV	1847	65	1	136	605	403
220 KV	11895	125	194	868	572	1497
132 KV	4552	2	28	183	17	92
66 KV	16876	1027	804	917	982	1120
TOTAL	35170	1219	1027	2104	2176	3112

To cater the power supply during 12th Five Year Plan, GETCO has planned to establish 60 numbers of Sub stations every year (total 300 numbers S/S of various class of voltage) and related transmission lines.

Chapter 7: Decentralized Distribution Generation (DDGs)

The Gujarat State Electricity Corporation Ltd. (GSECL) is deemed to be one of the pioneers in supporting Clean Climatic Initiatives. Gas is considered as a most viable solution for sustainable ecology. GSECL has more than 700 MW of gas based power generation capacities[12] and additional GSECL has also installed a wind farm and is setting up a solar based power plant[13].

The potential of taking up DDG scheme in the state of Gujarat has not been attractive, as most of the villages have access to grid supply. The population in remote villages will prefer cheap electricity being available to them through grid electricity. The transmission network in Gujarat is growing rapidly; hence the remote villages are getting connected to network with progress of state grid. Consumers will like to get electricity with least efforts. With the launch of different schemes of state government, fund provisions are being made and the grid supply is being extended to remote villages (schemes are documented in Annexure A and budget provision in Annexure C). DDG projects can be taken up under RGGVY in remote villages where grid connectivity is either not feasible/cost effective and not expected within 5-7 years. These directives have been modified. GEDA the nodal agency in the state is very active on development of renewable scheme. The entrepreneur in the RE sector will like to have an example of success-story. Earlier inspired by Gandhian philosophy, many small scale bio-mass and gobar gas plants have come-up. The Ankur Industries and Gujarat Agro have experience in developing and implementing of bio-mass based energy scheme. But due to interrupted functioning of the system, incidence of breakdown occurs frequently. Subsequently projects get abandoned.

Schemes of DDG, should be encouraged under RGGVY where there is potential to reduce T&D losses. The DDG system is given an industry like management structure. The state government of Gujarat have initiated on its own renewable project such as (Solar) in Charanka village, Patan District with a capacity of 500 MW.

An overview of Renewable Energy resources in the State of Gujarat has been prepared by TERI and is available in the net. Gujarat is one of the biggest states of the country, having a large amount of waste land. Gujarat has over 6.7 million hectares of wastelands, almost 10% of the 63 million hectares of waste land in the country, which could be productively used to grow energy plantations. The region gets good solar radiation throughout the year. The state has long coast line

[12] http://www.gsecl.in/projects.php ; Accessed January 2012

[13] The Policy on Solar Energy and Wind Energy are available in the "Department of Energy and Petrochemical" web site (see: http://guj-epd.gov.in/)

that has potentials to harness wind energy resource for most part of the year. TERI has studied the resources inventory pertaining renewable energy in the state of Gujarat. Apart from solar and wind, there is, biomass, tidal, and geothermal resources that are also available in the state.[14] The government of Gujarat has been proactive on renewable energy harnessing. They have developed infrastructure to facilitate water availability from Narmada and other canal systems, existing electrical power availability from thermal station supported grid based transmission network and gas grid network. The state government has a vision of Kalpasar Project.

Gujarat Energy Development Agency is the nodal agency of MNRE. They have installed solar systems in the remote villages in the district of Ahmedabad, Vadodara, Gandhinagar, Patan, Rajkot, Anand (Bio-mass based gasifier) etc. In the coastline they have been installed wind-mills. A demonstration project on bio-gas based electricity generation and composting (by NADEP method) was installed and commissioned in November 1997at Shree Idar Panjrapole Sanstha based on about 300 - 350 cattles.

The integrated approach gives logic for selection of the RE technology (wind, solar, biomass, and others) as per the strength of the resource availability in that particular area. It is envisaged that this integrated approach of RE resource assessment and the RE resource maps developed based on this study will be a very effective tool. In the next chapter we observe the type of franchisees being developed in the state. Few among these franchisees can become entrepreneur of DDG system provided they have a success story of DDG system.

[14] http://www.teriin.org/index.php?option=com_ongoing&task=about_project&sid=99; Accessed December 2011

Chapter 8: Franchise Models in Operation

Under the RGGVY Programme, franchisees were declared as mandatory to ensure effection billing and revenue collection in villages. In the surveyed villages it was found that all villagers receive the bi-monthly bills from the DISCOMs. And in case of motive power industrial consumers they get bills on monthly basis. Not a single case was observed that the people are not getting their bill. The bill is served by DISCOM meter reader regularly.

Mostly in Gujarat Revenue collection franchises are operating. Proper care is taken for fraud or malfunction of this machinery. The franchise has to deposit appropriate amount in the DISCOMs against the receipt of bills and regular remittance of collected amount is to be made in account of DISCOMS. The proper watch from DISCOM is kept for functioning of the Franchisees.

Most of all consumers are found paying bill regularly except in some cases of BPL. Poor people are paying their bill during the next month to avoid disconnection of power supply. In case of 19 villages out of 25 surveyed villages the employee of DISCOM (cashier) is deputed to the village for 4-5 hours for collection of bill amount. The consumers are informed about the collection date by the meter reader while issuing bills. In the 4 other villages the Gram Panchayat employee collect the bill.

The post offices are also authorized to collect the bill amount. During survey it was observed that 4 post offices are collecting bill out of 25 villages. There is a facility of bill collections in 3 villages where the consumers pay their bills in nearby post offices. Or if the post office facility is not available, people can deposit their bill amount in the nearby village post office where. This facility of collection of bill encourages the consumer to pay bill regularly and in term the DISCOMs get their revenue in time.

Table 8.1: Revenue Collection Facility in Surveyed Villages

	Collecting Body			
DISCOMs	Nearby Post Office	Village Post office	Discom Employee	Gram Pachayat
UGVCL	2 Villages	1 village	2 Villages	1 village
MGVCL	1 village	3 village	1 village	3 village

The state of Gujarat has initiated actions to deploy franchisees in compliance to RGGVY guidelines on Franchisee and to sustain incremental growth by mainstreaming franchisees in the rural electrification with viable operation and maintenance tasks. In the state of Gujarat the Franchisee have been operating under UGVCL in the district of Meshana, Patan, Ahmedabad, Gandhinagar, Banaskantha, Sabarkantha; and under jurisdiction of MGVCL Panchmahal, Anand, Vadodara, Kheda, and Dahod. Their services are being utilized for cash collection, On Spot

Billing, HT LT line maintenance, erection of HT/LT/TC and replacement of T/C. These modalities are in the process of development. In a while they are expecing to develop according to RGGVY models. The success story of these franchisees can be followed in other states. The efforts of UGVCL in Franchisee deployment are listed in Table 8.2.

Table 8.2: Information for Gujarat DISCOM - UGVCL

Sr. No.	Name of District/ Project	Electification RGGVY Villages		Frenchaisees		
		Coverage	Achievement	RGGVY Villages		
		Electrified Villages	Electrified Villages	Numbers of franchisees Deployed	Numbers of villages covered under the franchisees operation	Type/ Model of Frenchaisees
1	Meshana	595	595	595	595	Cash collection
				4	24	On Spot billing
				8	95	HT LT line maintanance
				28	595	Erection of HT/LT/TC
				18	487	Replacement of T/C
2	Patan	517	477	229	253	Cash collection
				1	4	On Spot billing
				10	268	HT LT line maintanance
				13	451	Erection of HT/LT/TC
				9	315	Replacement of T/C
3	Ahmedabad	546	536	336	336	Cash collection
				1	19	On Spot billing
				8	160	HT LT line maintanance
				18	504	Erection of HT/LT/TC
				6	125	Replacement of T/C
4	Gandhinagar	290	290	214	214	Cash collection
				1	22	On Spot billing
				25	140	HT LT line maintanance
				11	265	Erection of HT/LT/TC

				4	60	Replacement of T/C
				648	580	Cash collection
				2	199	On Spot billing
				69	1244	HT LT line maintanance
				69	1244	Erection of HT/LT/TC
5	Banaskantha	1244	1244	18	870	Replacement of T/C
				1131	1131	Cash collection
				2	2	On Spot billing
				14	786	HT LT line maintanance
				30	1372	Erection of HT/LT/TC
6	Sabarkantha	1372	1372	19	1118	Replacement of T/C

The state government has e-mitra system for billing and revenue collection; during the interaction with UGVCL (DISCOM) they provided figures highlighted in Table 8.2 and Figure 8.1, 8.2, 8.3, 8.4, and 8.5 indicating their efforts in franchisee development

Figure 8.1: Cash Collection Franchisee

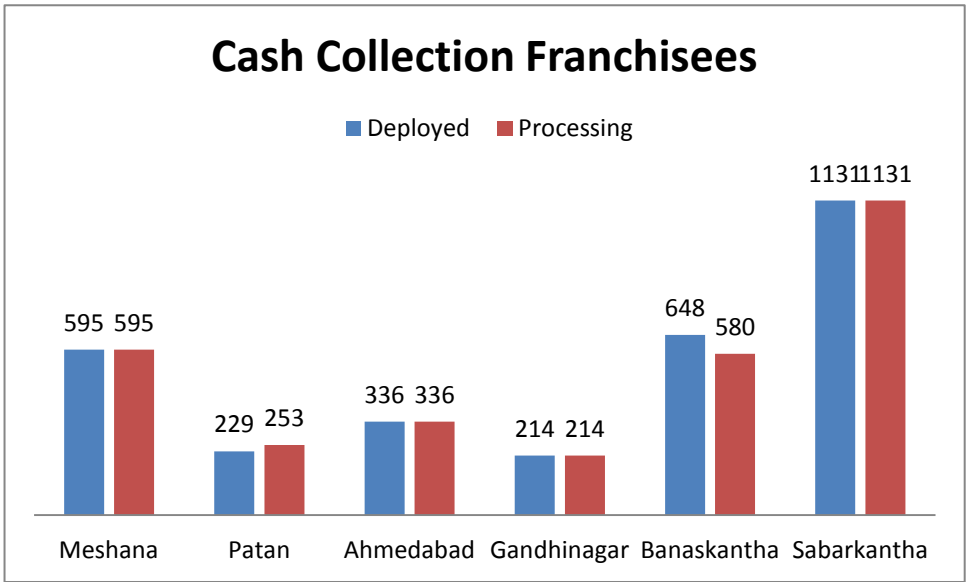
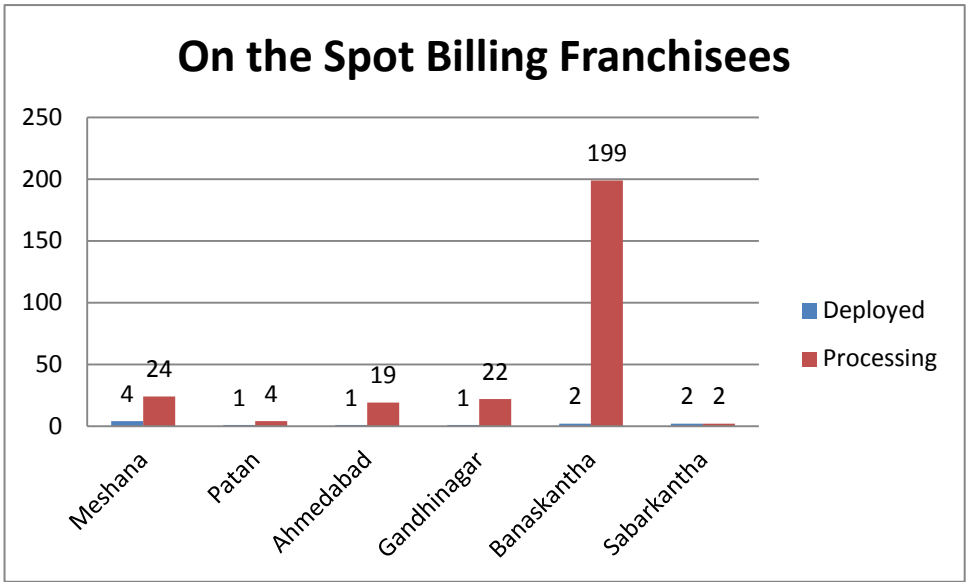


Figure 8.2: On the Spot Billing Franchsee



The state DISCOM is attempting to develop the franchisee as shown in the figures 8.2. In these figures the series 1 depicts "Numbers of franchisees [according to the legends] Deployed" and the series 2 indcate "Numbers of villages covered under the franchisees operation". The number of villages considered in the districts of Meshana, Patan, Ahmedabad, Gandhinagar, Banaskantha and Sabarkantha are 595, 517, 546, 290, 1244 and 1372 respectively.

Figure 8.3: HT & LT Line Maintenance Franchisee

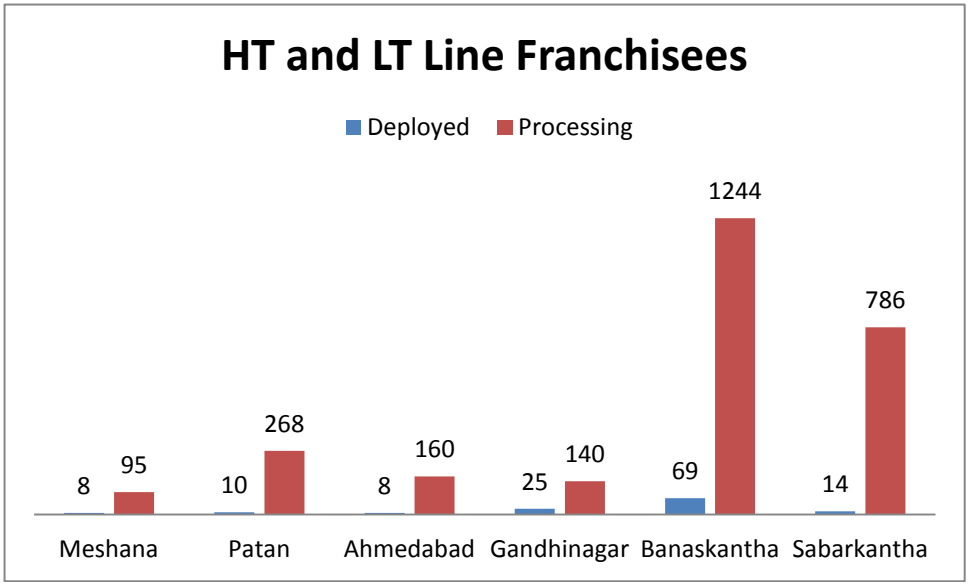


Figure 8.4: Erection HT/LT/TC Franchisees

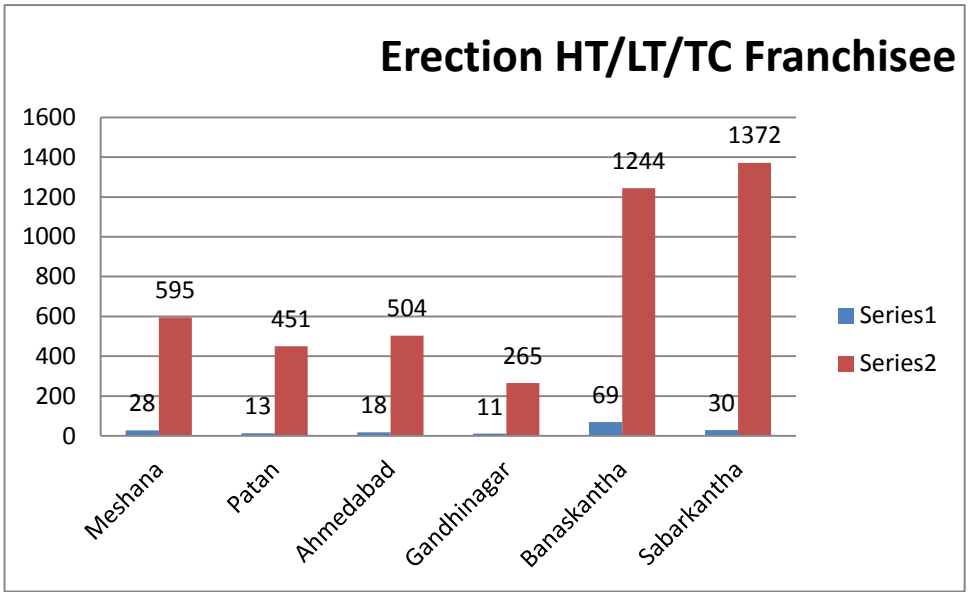
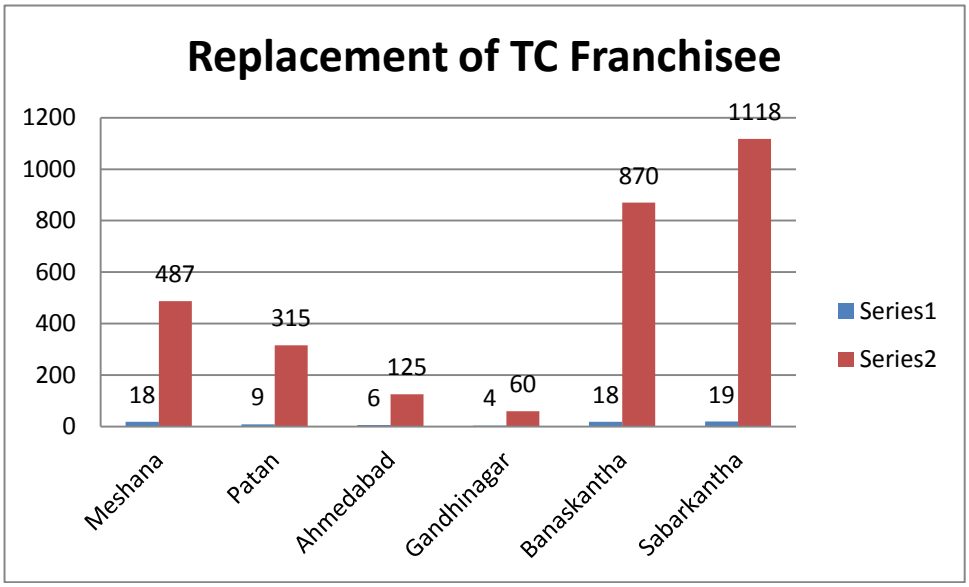


Figure 8.5: Replacement of TC Franchisee



The similar efforts of MGVCL in Franchisee development and deployment are listed in Table 8.3

Table 8.3: RGGVY – Status of Franchisees deployment, MGVCL, Gujarat

Sr. No.	Name of District Project		Franchisees Details		
			RGGVY Villages		
		Electrified Villages	No. of Franchisees deployed	No. of Villages covered under franchisees operation	Type/ Mode of franchisees
10th Plan					
1	Panchmahal	1201	49	1028	FEEDER FRANCHISEE (MAINT.)
			276	1201	REVENUE (POST OFFICE)
			658	1113	REVENUE(E-Gram)
	10th Plan	**1201**	**983**	**1201**	
11th Plan					
1	Anand	350	313	350	REVENUE
					(POST OFFICE,Co-op soc,banks,ATP)
			350	350	REVENUE(E-Gram)
2	Vadodara	1543	550	1543	REVENUE (POST OFFICE)
			762	762	REVENUE(E-Gram)
			2	13	MEGA
3	Kheda	612	500	500	REVENUE (POST OFFICE,Co-op soc,banks,ATP)
			480	480	REVENUE(E-Gram)
4	Dahod	692	9	374	FEEDER FRANCHISE (MAINT.)
			251	650	REVENUE (POST OFFICE,Co-op soc,banks,ATP)
			459	459	REVENUE(E-Gram)
	11th Plan	**3197**	**3676**	**4398**	
	MGVCL	**4398**	**4659**	**4398**	

Some of the Important Initiatives Taken by DISCOMs to strengthen Franchisees deployment (Information from MGVCL)

A. Management of Electricity with Gramya Associate (M.E.G.A.)

MEGA: For improvement in customer services and to improve network through better maintenance, the scheme called MEGA (Management of Electricity with Gramya Associate) has been launched, wherein the co-operative societies, NGO, a group of prominent villagers would act as distribution franchisee. Such 12 franchisees are under operation in MGVCL, who maintain the power, attending complaints, distributing bills, collecting bill amounts, providing Meter installations, surveillance and awareness to consumers.

B. Individual franchisee:

(a) MGVCL has awarded Individual franchisee for the feeders and at present more than 34 feeders has been allotted for individual franchisee. Under these franchisees the maintenance activities in the villages covered on these feeders are carried out. The total 600 number of villages are covered.

(b) Collection Franchisees: The collection franchisees are linked and allotted to post offices in each village, Gram Panchayats, individual cooperative societies. Such 1800 collection franchisees are at present working in MGVCL.

C. Theft Control Measures:

The DISCOMs are aware of electricity theft in the rural areas. They have started by strengthening the hardware and back it up with administrative measures.

Following theft control measures (technical) are taken by the company:

- Use of ABC LT Cable in rural areas and slums in urban areas.
- Use of XLPE coated LT overhead conductor in rural areas.
- Use of XLPE coated service line in theft prone residential areas.
- Use of Pole Mounted Service Connection Box.
- Meter inside the houses to be taken out and installing SMC Boxes.
- HVDS in theft prone areas using small capacity transformers.
- Use of tamper proof Electronic Meters.
- Use of tamper proof polycarbonate seals.
- Use of 3 phase 4 wire CTPT in place of 3 phase 3 wire CTPT.
- Use of armoured metering cable in case of HT/EHT connections.
- Breaker in-built CTPT is not used for metering in case of HT connection.
- All metering CTPT units installed at the entrance of the factory premises.
- All CTPT units are sealed with polycarbonate seals and duly tested at ERDA.

- Half yearly installation checking of motive power connections above 50 HP.
- Study of energy consumption pattern through our own developed software.
- Checking of zero consumption of meters and Permanently Disconnected Consumers.
- Energy Accounting through DTR Metering thereby segregating high loss Distribution Transformers.
- The incentive schemes by the Government for giving information about theft of power.

Chapter 9: Performance of Distribution Utilities and Rural Network

The state government is committed to bring down AT & C losses below 15%. This has been part of their agenda in Rural Electrification Plan. They have initiated and have taken various measures, issued guidelines that have been listed in the Annexure B. The Gujarat DISCOMs have strategized incremental reduction in AT & C losses. The targets set by GUVNL are listed in the table 9.1. It is evident, the losses in the PGVCL region are highest among the DISCOMs, and the transformer burning rate is also the highest among DISCOMs (Refer to table 4.11). Considering the transformer failure is approximately 3 times higher in rural areas, a special initiative is needed to reduce transformer failure that will reduce the AT & C losses also.

Technical distribution losses in the villages surveyed has been managed by designing village level network (a) based on HVDS architecture (b) by providing 3 phase supply and establishing balanced load for the village.

State has streamlined revenue collection by having emitra scheme. To prevent theft of power (mentioned in previous chapter), and misuse of the network, they have created high power vigilance organization. The primary challenge is to increase revenue collection by increasing consumer base. In the surveyed villages there were very few small commercial units. The commercial units will be good source of revenue generation. Few stakeholders mentioned that the government is planning schemes to encourage formation of commercial units in rural areas. During the process of survey it was observed those BPL households were consuming more power than that was planned in DPR (0.04 KW). The infrastructure developed has adequate capacity to sustain load that they were drawing. The load standard for BPL and APL consumers may be considered 250 Watt and 500 Watts respectively (or higher for APL) in case of Gujarat state for future planning. The GUVNL organizes tasks of subsidiary companies on approved energy plan. Approved Energy Plan for the FY 2011-12 (in MU) is highlighted in Table 9.1

Table 9.1: Approved Energy Plan for the FY 2011-12 (in MU)

DISCOMs	Energy requirements	Energy Losses*	% Losses	Agriculture Consumption
DGVCL	12371	2098	17	718.92
MGVCL	8659	1506	17	1142.75
PGVCL	21694	7173	33	7335.41
UGVCL	17375	3261	19	8877.08
TPL	9946	174	2	
Total	**70045**	**14212**	20	**18074.17**

* Total energy losses includes distribution losses, transmission losses and pooled losses in PGCIL system

The computed AT & C Losses of DISCOMs in the financial year 2010-11 is indicated in the table 9.2. This also shows the Technical & Commercial efficiency at different DISCOMs.

Table 9.2: AT & C Losses for the Year 2010 – 11 (DISCOMs in Gujarat)

AT & C Losses for the year 2010 – 11 (DISCOMs in Gujarat)							
		DISCOM					
Sr. No.	Particulars	DGVCL	MGVCL	PGVCL	UGVCL	GUVNL	Total
1	Electricity Purchased in Mus	11704	7772	20883	14966	4232	59557
2	Electricity Sold out in Mus	9837	6328	14699	13323	4232	48419
3	Losses in Mus	1867	1444	6184	1643	0	11138
4	**% T&D Losses**	**15.95**	**18.58**	**29.61**	**10.98**	**0**	**18.7**
5	Assessment in Rs Lacs	5792	3534	5711	5235	1652	4922
6	Collection in Rs Lacs	5741	3533	5711	5192	1870	4923
7	% Collection Efficiency	99.12	99.97	100	99.18	100	100.02
8	Units realized in MUs	9750.38	6326.21	14699	13213.57	4232	48428.84
9	**% Aggregate Technical & Commercial (AT&C) Losses**	**16.69**	**18.6**	**29.61**	**11.71**	**0**	**18.68**

The GUVNL has planned the implementation of R-APDRP effectively. From the documents available, it appears that they have enhanced the scope of R-APDRP implementation. They are also planning to include ERP under IT revamp planning. As the GUVNL has effective review mechanism and a follow-up system, it can be construed that with R-APDRP the state will be able to collect information in real time mode and at the source. These facilities will help in reducing commercial distribution losses in villages. Monitoring rural electrification under R-APDRP will facilitate development in rural areas, by pre-emptive and preventive actions.

The Gujarat Electricity Board (GEB) changed from a loss to a profit making organization with its technical strength and business sense.[15] The revenue collection and other source of income from commercial sources are high. The tariff is structured considering all variability that includes cost of fuel. The GSECL is a profit making subsidiary. The profit earned by the GSECL will be used amongst others for generating additional capacities. Compared to similar power projects in other

[15] http://www.gsecl.in/projects.php; Accessed January 2012

states, GSECL's power generation tariff is low.[16] The DISCOMs have a good consumer base that ensures them timely flow of cash. Profit statement of DISCOM is indicated in Table 9.3.

The balance sheets of DISCOMs have a component "Deferred Government Grants, Subsidies & Contributions". Contribution, grants and subsidies towards cost of capital assets are not reduced from cost of assets and are treated as deferred revenue, and 10% of the year end balances of such contributions, grants and subsidies are transferred to profit & loss account.

The profit and loss account has "Revenue Subsidies and Grants". Revenue Subsidies are accounted to the holding company (GUVNL) for on accrual basis on finalization of amount of claim by Gujarat Government and the same has been credited to profit and loss account. The revenue subsidies are indicated under agriculture head.

Table 9.3: DISCOM Financial Statement

Name of Company	Profit in Lacs (Before Tax)		Profit in Lacs (After Tax)	
	2008-09	2009-10	2008-09	2009-10
DGVCL	371	4091	299	2158
MGVCL	597	2289	453	1705
PGVCL	219	1946	109	385
UGVCL	749	694	595	565
GUVNL	514	5676	501	1986

Due to better health of the Finances of the DISCOMs, the government has been able to invest in the rural electrification projects regularly. The table 9.4 indicates the quantum of investment made by the government over the years.

Table 9.4: Budget Allocation by State Government for Rural Electrification and the %-Growth (2007 – 2012)

Year	Budget Allocation by State Govt. for Rural Electrification Rs. Lakhs	Growth %
2007-08	9574	
2008-09	38180	298.79
2009-10	49300	29.13
2010-11	66428	34.74

[16] ibid.

2011-12	48032	-27.69

In order to maintain administrative discipline, the Government of Gujarat has strategized Rural Electrification with features such as:

(a) There is no provision of subsidy to agriculture pump sets

(b) Subsidy prescribed to agriculture consumption is **Rs. 0.50/Kwh and**

(c) Currently there are no incentives for the Decentralized Distribution Generation

Vide Electricity Act 2003; the subsidy accounting procedure is stipulated. The subsidy amount budgeted and the subsidy amount paid is indicated in the table 9.5. GUVNL subsidiary companies have ensured efficient working to save on budgeted amount.

Table 9.5: Subsidy Paid by the State Government

Year	Subsidy budgeted Rs. Lakhs	Subsidy Paid by State Govt.	
		Booked Rs. Lakhs	Paid Rs. Lakhs
2007-08	17,54,24	19,34,35	17,54,24
2008-09	28,71,04	32,14,97	28,71,04
2009-10	27,07,00	28,31,04	27,07,00
2010-11	26,62,00	28,62,90	26,62,00

Annexure B highlights the guidelines issued through DISCOMs, which should be followed to make DPR, execution plan, material procurement and tendering. This also highlights best maintenance and operation practices; in REDB and VEI under RGGVY and make the process and procedure more productive.

- Use of LT overhead XLPE coated conductor:
- Use of 2.5 Sq MM, 2 Core, XLPE LT Cable for Single Phase Service Connection.
- Use of 35 mm2 single core Aerial Bunch Cable:
- Use of 3 Phase Ariel Bunch Conductor (ABC):
- Bifurcation of Feeders:
- Load Balancing:
- Optimum size of Transformers:
- S.D.T. (Special Design Transformer):
- Low Loss Transformer :
- High Voltage Distribution System (HVDS):

- Automatic Power Factor Controller (APFC):
- Energy Accounting:
- Jyotigram feeder:
- Agriculture dominant feeder:
- Prepaid Meters:
- Electronic Meters:
- Surveillance:
- Sub-Station Monitoring:
- Qualitative Installation Checking:

Chapter 10: Commitment of the state Government on Success of Rural Electrification

According to information provided by the Gujarat State Electricity Corporation Ltd. it regularly maintains and keeps up the power stations. A continued and efficient operation will be ensured due to the renovation and modernization of old power stations.[17]

Effectiveness of metering system

As already mentioned in chapter 4, all categories of connections are metered. Only HP based agriculture connections released prior to 10.10.2000 are un-metered. The State Commission has directed DISCOMs to complete the installation of meters in phased manner, however the metering in the agriculture sector is only 40%. Regarding metering in general the state DISCOMs have taken various measures with primary focus in urban areas. With success they will be extended to the rural areas also. Opportunity exists in deploying ESCos for unmetered rural pump-sets.

The Rural Electrification policy of Gujarat, by state energy department may include declared policy initiatives on solar and wind energy and also include directives on Renewable Energy certificates. The renewable energy certificates can be traded. Similarly CDM for solar projects can be planned.

There are various schemes operating for electrification in weaker section of the society.The policy implementation need budgetary provision, which is documented at Annexure C.

The DISCOMs have enhanced experience for implantation of projects like Jyoti Gram Yojana and RGGVY by which huge infrastructure is created for 24 hours power supply in rural areas. In case of rural electrification of the state combined efforts of state government and central government programme, work has been completed in homogeneous manner. In Gujarat, due to simultaneous implementation of Jyoti-gram Yojana, the quality of power supplied to villages has improved. Moreover, the commission has given the following directives to DISCOMs during the MYT order for FY 2011-12 to FY 2015-16 to improve the supplies to agricultural connections:

- The DISCOMs are directed to ensure quality power supply with proper voltages to all categories of consumers, particularly in the case of power supply to agricultural consumers by providing required reactive compensation etc.
- 100% metering of agricultural consumers is crucial for proper energy accounting, determination of extra cost of supply and determination of subsidy. The commission has directed the DISCOMs to improve the status of metering of agricultural consumers.

[17] http://www.gsecl.in/projects.php; Accessed January 2012

- A realistic consumption by agricultural pump-sets could be obtained only by providing meters at distribution transformers and properly noting LT losses on the LT network under the distribution transformers. For this, the Commission had directed the DISCOMs to provide meters to all agricultural transformers.

Comments

Considering the good performance of RGGVY and rural electrification in the state, it is observed that the long term success of rural electrification and the success of the implementation of RGGVY programme depended on qualitative participation of the state; such as Jyoti Gram Yojana.

The state has a nodal agency GEDA to pursue central government objectives of MNRE. REC can see the process of harmonization of renewable projects between GEDA and RGGVY; and induce their interest in the DDG scheme. GEDA has initiated several renewable energy based projects that are expected to be off-grid system. Extension of power grid interactive with off-grid systems, which are located in rural areas, should be developed. This can address the rural electricity demand and can boost development of renewable energy sysyems.

Capacity Building:

REC has developed training centre at Hyderabad office. That is for all India. Considering the progress made in the state, the capacity needs of the state are of different nature. The state has made transition in rural electrification from agriculture pump-set to domestic connection. The next step is to provide commercial connection. Hence state can develop capacity development module, that should focus on quality of services in each domain.

Sustainability of rural infrastructure

Ensuring sustainability of rural infrastructure is a problem. In the surveyed villages population is low and hence the revenue generation by providing domestic connection cannot be enough to support operation, maintenance etc. In this context, universal access to electricity should be achieved through a comprehensive rural electrification plan. In case of Gujarat revenue collection system is in place, and for the released BPL connections billing/revenue collection and other infrastructure is available. Existing framework can manage to maintain the lines, transformers etc. The focus should be on minimizing breakdown of infrastructure, as transformer breakdown, which is very high in some circles.

Handing over asset

The Handing over asset from PIA to DISCOM, guidelines need to be more comprehensive. At the DPR making stage adequate warranty, one year post warranty spares should be provided. State DISCOM should not delay the taking over of asset. If the state wants to electrify BPL on its own with improved armored cable which is not as per REC specification, then this should not be delayed. The state can take over the asset and then release the connections. The payment clause may be modified accordingly. By and large REC standards and specification should be followed uniformly. During the discussion this point was highlighted.

Documentation

There should be proper documentation of the whole RGGVY implementation in a very effective manner so that everything is monitored properly, which sometimes are not being done in case of DISCOMs. Milestones and wise monitoring are hardly followed by REC as it can only be done with proper documentation.

Gujarat has issued tariff order for 5 years. The process of projection of quantum of electricity required in rural areas in the state is not clear.

During the survey, generally all desired institutions were in place with defined process and procedure. The requirement is to enhance their efficiency. The DISCOMs can introduce Total Quality Management (TQM), practices in rural electrification domain and include participation of consumers.

General Comments

1. An effective coordination mechanism is needed between Central and State Govts to efficiently utilise the RGGVY infrastructure created and to push rural electrification towards Commercial sustainability.
2. Rural electrification plans are difficult to become financially sustainable unless these become part of the commercial operations of Distribution Circles combining urban and rural distribution network.
3. National rural electrification policy should be the basis of evolving State rural electrification policy and plan so that electricity could reach each and every house hold.
4. Policy on providing subsidies for rural electrification should be clearly defined so that the subsidies could be gradually reduced to zero as per the intent of the EA-2003.
5. DDG based on renewable energy resources with provision to connect to the grid would be required to make these financially viable propositions.

6. There is need to increase economic activities in the Villages and to eliminate rural-urban divide through infrastructure development
7. There is a need to develop economic activities in rural areas through state intervention to make the RGGVY investment sustainable.
8. DPRs for further investments need not be District based or Centralised Investments should be made, Distribution Circle wise and these should be made cost and profit centres to improve the accountability and efficiency of investments.

Conclusion:

There are multiple stakeholders involved in the rural electrification implementation; so a very structured and detailed planning and implementation strategy is required for the smooth implementation of rural electrification scheme. During the interaction with stakeholders it was observed that coordination problems were there among the stakeholders while implementing the RGGVY. The issues are generally of financial, institutional, procedural, managerial (project management) and co-ordination problems linked to state government or central government scheme. During the study all the issues are discussed in detail with the concerned authorities and it was analyzed.

In Gujarat the work involved were focused on providing for BPL connections only. These work are few thousand kms of HT line, ten thousand kms of LT line and few thousand number of distribution transformers only. Looking to the work structure, it required, lot of issuing contracts to PIA and contracts for material procurement for repairs and maintenance; furthermore the PIA also has to procure materials like poles, conductors, transformers etc. It takes time for PIA to find out contractors for erection of infrastructure. These jobs can be done by DISCOMs, it will be easier because DISCOMs are carrying out such work; and are having their own procurement cell. Materials can be procured along with other schemes, which reduce the time for procurement of material and erection of line as in case of PIA.

Rural electrification work is effective in Gujarat, the challenge is how to enhance other economic activities and social activities in rural Gujarat. Despite vibrant economic activity in Gujarat state the education level in rural Gujarat is on the lower side. Rural electrification can boost the education system in the state.

Despite good maintenance facilities for rural area, there is high transformer burn-outs especially in West Gujarat DISCOMs. The challenge is to enhance capacity of the maintenance staff of Gujarat DISCOM, with respect to Transformers. DISCOMs are promoting Franchisees in form of maintenance works apart from revenue billing and collection. The capacities of franchisees have to be enhanced. REC training institute, Hyderabad has conducted training programme for C & D grade employees of DISCOMs. Now REC can plan process of including total quality Management system in their programme and guide the process of TQM in rural electrification in Rural Areas.

Strategy and scope has to be defined for DPR preparation of partially electrified villages, under RGGVY programme and parallel state government scheme. The defined scope should be flexible enough to provide infrastructure to max number of village population. The demand of APL consumer should be taken into account. Based on annual growth, a demand estimate should be provided to calculate Rural Electricity Distribution Backbone (REDB) and VEI requirement. In respect of giving BPL connections, there is the requirement of having BPL lists which are not readily available. The BPL list should be made available by the district authority in time.

ANNEXURE A: State Government Schemes

- **Planning for the year 2011-12 of Rural Households Electrification Schemes in DISCOMs by Gujarat State:**

(I) ELECTRIFICATION OF HUTMENT (Zupada Vijlikaran) SITUATED IN RURAL / URBAN AREAS:

This scheme is for electrification of hutment in certain slum areas situated in and around urban and rural areas in the State, with a view to give benefit to socially, economically and educationally weaker sections of the society, who are living in these unhygenic hutments. The outlay of **approximately Rupees** 2400.00 Lakhs was provided for the year 2010-11 against which expenditure of Rupees 2400.26 Lakhs is incurred and 38553 Zupada Vijlikaran have been electrified up to November 2010 against target of 37000. It is proposed to electrify 52800 numbers of hutments in both urban and rural areas at an outlay of rupees **4000.00** Lakhs during the year 2011-12.

(II) Kutir Jyoti Scheme.

To meet the basic requirement of poor families located in tribal areas, State Government has sponsored this scheme in continuation. Under this Scheme single-phase connection with Single point wiring is being given, free of cost. Tribal families whose annual income is less than ` 11000 and the house is situated within 100 meters radius from the existing LT distribution mains are eligible under this scheme to avail the House Hold connection. Under Kutir Jyoti, 9524 connections have been given at a cost of Rupees 280.00 Lakhs up to November 2010 against target of 26000 connections with an outlay of rupees 900.00 Lakhs. During the year 2011-12, it is proposed to electrify 14400 houses under Kutir Jyoti at an outlay of Rupees **500.00** Lakhs.

(III) TASP Schemes:

(a) Tribal Area Sub Plan Scheme for House Hold Electrification:

Under this scheme Wells and Petaparas are electrified in tribal area of the State. It was targeted to electrify 100 numbers of Petaparas and 10960 numbers of wells during 2010-

11 at an outlay of rupees 16940.00 Lakhs under this scheme. Up to November 2010, 61 Petaparas and 7199 wells have been electrified at the expenditure of ` 9132.00 Lakhs. It is proposed to electrify 150 numbers of Petaparas, 11800 numbers of wells and villages and petaparas to be converted to conventional method during 2011-12. An outlay of rupees **20200** Lakhs is proposed for the year 2011-12 under this scheme.

(b) TRANSMISSION SYSTEM:

Expansion and upgrading of transmission system in the State with the growth in generation capacity as well as power demand has to be done on continuous basis. The growth in power demand calls for laying of transmission lines and sub-stations in the power demand areas and at the other end power evacuation lines are required to be laid for evacuation of power generated at various generating stations owned by GSECL, Central Sector and IPPs as well as captive power plants.

A provision of rupees 18000.00 Lakhs was provided for the year 2010-11 and expenditure of Rupees 8892.00 Lakhs was incurred up to November 2010. It is proposed to make provision of Rupees **13000.00** Lakhs for transmission schemes for the year 2011-12 under TASP for 400/66 KV Sub-Stations at different locations and its associated lines.

(IV) Scheduled Caste Sub Plan (SCSP):

Under this scheme, benefit is given to Schedule Caste Households. As per budget estimate, 5000 households of SC will be electrified with an outlay of rupees 500 Lakhs during 2010-11. Up to November 2010, 5101 Scheduled Caste Households have been electrified at an expenditure of rupees 147.00 Lakhs. It is proposed to revise budget proposal for electrification of SCSP HH to **rupees** 250.00 Lakhs. During 2011-12, 5000 numbers of Scheduled Caste Households & 1200 Numbers of wells are proposed for electrification with an outlay of ` **500.00** Lakhs.

As is known, the power is fed to State through Power Grid close circuit loop system, i.e. Ring Main System. Hence power generated at any point in the State reaches the scheduled caste localities also on equitable basis. A provision of ` **83954.00** Lakhs is proposed for generation schemes for the year 2011-12 in the State Plan for Energy Sector. Of these 7.15% is estimated to benefit the scheduled caste on equitable basis.

Similarly Transmission system caters load demand at various Load Centers, from where the Distribution feeders cater consumers' requirements. Thus Transmission system is

intermediate between Generation and Distribution of Power. Number of transmission lines/sub stations will thus cater to the requirement of the State as a whole. Thus more than 7.15% of the benefits will reach to the scheduled caste population against the provision of the rupees **13000.00** Lakhs for transmission schemes for the year 2011-12.

All the villages of Gujarat were electrified during 1988-89 where SC Bastis were also electrified. Therefore SC households left out to be electrified are very negligible. GUVNL is not getting applications. GUVNL has introduced incentive scheme, by which an amount of rupees 25/- is being paid to NGOs/Gram Mitras/Panchayat Helper or individual who motivate & make the beneficiary to register his application to get electric connection under SCSP. (Therefore, it is not possible to allocate directly 7.15% amount of total budget towards SCSP.)

(V) <u>Coastal Area Development Programme (Sagar Khedu Sarvangi Vikas Yojana):</u>

A provision of rupees 17688 Lakhs was made in the year 2010-11 against which rupees 3353.00 Lakhs expenditure was incurred up to November 2010. An outlay of rupees **10648.00** Lakhs is proposed for the year 2011-12. It is planned to replace 4891.66 Kms of deteriorated conductors, replacement of 6084 poles providing additional insulators and replacement of existing insulators wherever required. It is planned to replace 2763 distribution boxes and 1808.31 KM of service line at an expenditure of Rs.10648.00 Lakhs. In addition work of erection of 1No. Of 400 KV (partial) & 15 Numbers of 66 KV new Sub-stations along with associated lines will be carried out at an estimated cost of ` 7020.00 Lakhs and R & M of transmission lines at an estimated cost of ` 641.00 Lakhs by GETCO.

Above these are the additional Capital investments in Transmission & Distribution to feed rural areas, undertaken under the Schemes like, TASP (by GETCO), Sagarkhedu & HVDS (KHUSY)-by DISCOMs.

ANNEXURE B: Materials Guidelines

Use of LT overhead XLPE coated conductor:

To avoid hooking, reducing transformer failure, interruption etc., in all the State/Central Government RE Schemes, i.e. Zupadpatti, Kutir Jyoti, MP/MLA, Scheduled Caste Sub Plan and RGGVY Schemes, instead of using bare overhead LT conductor, XLPE coated conductor is used.1060 kM XLPE and 2804 kM PVC coated conductor is used in the LT network. This has reduced the technical as well as commercial losses.

Use of 2.5 Sq MM, 2 Core, XLPE LT Cable for Single Phase Service Connection.

In the theft prone area, the unscrupulous consumers used to tap the service line directly before the meter and thereby stealing the electricity. It is easier and convenient for the consumers to fiddle with the PVC insulated cable; however after use of two core XLPE cable, such type of stealing of energy is reduced.

Use of 35 mm2 single core Aerial Bunch Cable:

ABC cable is used as overhead single phase two wire LT line for catering power supply to the cluster of single phase connections in the rural areas as well as theft prone areas mainly in the slums and hamlets. This system is more effective along with implementation of single phase 5 KVA Completely Self Protected (CSP) Transformers with implementation of HVDS. With this system, the hooking by the consumers is totally eliminated as well as whenever consumers try to use unauthorized load, i.e. heating load, the transformers trips with the in-built MCCB. This not only disconnects the power supply but also saves the transformer failure.

Use of 3 Phase Ariel Bunch Conductor (ABC):

Three Phase ABC conductor is used in the urban as well as rural areas and wherever there is a crossing of Agriculture (3 phase x 8 hours + 1 phase x 16 hours) and Jyotigram (3 phase x 24 hours) power supply network to minimize direct jumpering from Jyotigram LT line to agriculture LT line and also hooking by the consumers. During the year 2007-08, 750 KM of 3 phase ABC is used. This has reduced the theft of power considerably.

Bifurcation of Feeders:

To reduce the technical losses as well as to maintain the tail-end voltage regulation, the lengthy feeder and overloaded feeder having more than 100 Km. length and 150 Amp.

loading is further bifurcated. Such 36 overloaded and long feeders are bifurcated during 2007-08. This has reduced the technical losses and improved the voltage profile.

Load Balancing:

Due to Jyoti Gram Yojana, the Mix feeder consisting of irrigation pump load and lighting load is separated in two categories of feeders i.e Jyoti Gram feeder (7 x 24 hrs power supply) and Agriculture feeder (8 hours 3 phase power supply and 16 hours 1 phase power supply). Because of that, most of the Transformers were having un-balance lighting load i.e. on two phases. Therefore to reduce the Technical losses, the Transformers are balanced by measuring peak hour loading.

All the distribution transformers in urban areas as well as on industrial feeders are provided with electronic meter, the load profile of each transformer is studied and accordingly load balancing of each phase is done. This has reduced the transformer failure as well as improved the voltage profile on each circuit, which has led to reduction in technical losses.

Optimum size of Transformers:

Each transformer load profile is studied and if the connected load on the transformer is found less or more than the KVA capacity of the transformer, the transformer is immediately either de-augmented or augmented. This has reduced the technical losses of the transformer, and has improved voltage profile.

Low Loss Transformer :

Since last 5 years, the low loss transformers are used up to 100 KVA capacity. For the small capacity transformers used in rural areas, as well as where single phase power supply is given, the low loss transformers are used, which has saved the no load losses. Till date 2115 Numbers of transformers of different capacity are installed in the field.

S.D.T. (Special Design Transformer):

The company was facing a dicey situation by giving two phase supply during Load shedding hours to Rural feeders, resulting in to use of phase converters by the Agriculture consumers and thereby extraction of unauthorized power. The situation was such that the Amp. Loading during two phase supply was more than the three phase supply. To resolve this problem, Government introduced an innovative scheme called “Jyotigram Yojana” where the mixed

feeder was bifurcated into two feeders, i.e. Agriculture Dominant Feeder and Jyotigram Feeder. The Jyotigram feeder was given 3 phases x 24 hours supply whereas the Agriculture Dominant Feeder was given 8 hours power supply and for the balance hours load shedding was applied. This has created no supply to the consumers residing in the field / farm. To resolve their problem, an innovative Special Design Transformer is invented by the company Engineers. The Special Design Transformer is operated during Load Shedding Hours from the sub-station end, which gives 1-Phase power supply to all the consumers on the agricultural feeder during load shedding hours.

The Special Design Transformer is manufactured from the scrap transformers and the pay back period of the Special Design Transformer is only one to three days.

The use of Special Design Transformer has not only given single phase power supply during load shedding hours to the consumers residing in the field or in hamlets but also eliminated the use of phase converter which was the regular practice of the Agr. Consumers to use during two phase power supply. The SDT has also given the alternative solution against the use of single phase transformer with continuous earth return conductor. This has saved the huge capital expenditure by eliminating installation of single phase transformers.

The Special Design Transformer is approved by the Chief Electrical Inspector, Govt. of Gujarat, Gandhinagar as well as by ERDA, Baroda. This innovative design transformer has become popular and delegates from about 8 to 10 States have visited our company to see the operation and design of the transformer.

High Voltage Distribution System (HVDS):

HVDS is being implemented in MGVCL and other DISCOMs to reduce hooking in rural areas as well as to reduce the LT line losses. In order to implement HVDS system, sum of contracted load of feeders and sum of connected KVA of each TC is worked out and if there is an large difference between these two, de-augmentation of the transformer is recommended by way of providing appropriate capacity of Transformer in accordance with contract load.

MGVCL has already installed about 1700 Numbers of 5 KVA single phase transformer for Zupadpatti, Kutir Jyoti, suburbs and small clusters areas habitations. MGVCL is further going to install 5000 Numbers of 5 KVA single phase transformer during the years 2008-09 and 2009-10 after very careful study of the network village wise. The company has also purchased 10 KVA, 16 KVA, 25 KVA Transformers for giving power supply to individual agricultural connections under the Special Scheme, "KHUSHY" (Kisan Heet Urja Shakti

Yojana), i.e. HVDS. The implementation of KHUSHY (HVDS) will not only reduce the technical loss but also the commercial loss by way of reducing theft of power.

Automatic Power Factor Controller (APFC):

MGVCL has installed 8525 Numbers of Automatic Power Factor Controller (APFC) panels on 335 Feeders. It is planned to install further 5700 Numbers of APFC panel during the year 2008-09. APFC panels are used for improvement in Power Factor, thereby reducing reactive Power. Auto Power Factor Controllers are capable to switch ON and OFF the capacitors in stages and automatically maintain the desired power factor. The APFC will improve the supply voltage to the consumer as well as reduce the reactive component. This will lead to reduction in line current, which in turn, will enhance the capacity of the feeder.

Energy Accounting:

Meters are provided on Transformer Centers to find out weak pockets on feeders. Along with regular meter reading programs, meter reading of transformers are taken and TC wise losses are calculated. This helps us to have clear vision of weak pockets and help in qualitative installation checking.

Seven Action Plan being pursued at MGVCL.

1. All the 3 phase electro-mechanical meters are replaced With 3 Phase Static Tri-vector meter.
2. Single phase electro-mechanical meters are replaced With Single Phase static meters in phased manner.
3. The stopped meter; defective meter, slow meter etc. are replaced with new static meter.
4. All the meters are provided with 2-3 Numbers of Polycarbonate Special designed seals.
5. All the meters are kept in MM Box/SMC boxes duly sealed with Polycarbonate seals.
6. Wherever the meters are inside the houses they are taken out.
7. The service lines having joints are replaced with new Cable.

The meter readers are instructed to note on the back-side of the bill regarding the condition of the meter, viz. glass broken, seal tampered, meter without box, old clock type meter, meter burnt etc. to take immediate action by the SDO.

Due to implementation of above seven action plans, the commercial losses have been reduced considerably.

Strategies

Strategies for Loss Reduction on various categories of feeders are as under.

(A) JYOTIGRAM FEEDER:

- Providing AB Cable / Coated Conductor.
- Study consumption of Ind Consumers incl. Ice factory and Cold storages. It must be in accordance with cont. load and Nature of Ind, working shifts.
- Energy Acct. of DTR having 1-2-3 industrial consumers.
- Shifting of Agriculture Connections from JGY to Agr. Dominent Feeder.
- No extension of JGY LT Line for small cluster. Implement HVDS with 5 kVA DTR.
- JGY – Agr. Feeder Crossing.
- Attending Agr. T/C in the vicinity of JGY T/C.
- Monitoring of ampere loading JGY feeder. Abrupt rise must be studied.
- Providing appropriate rating of T/C
- W/w & Street Ltg. Consumption of SPGP

(B) AGRICULTURE DOMINENT FEEDER:

- Study Contract Load of Agr. Consumers
- Study capacity of all DTR.
- Feeder Loading must be in accordance with contract Load.
- Deaugment DTR according to Contract Load.
- Study the Failure of Ag. T/C. Check Agr. Connection on it for unauthorized Load.
- Implement HVDS pocketsize. Propose 10kVA, 16kVA or 25 kVA T/C for HVDS
- Rectification work on Agr. Metered Tariff Consumers.
    a) Static Meter
    b) Last span Insulated
    c) Meter outside Room
    d) MMB & Sealing
- Agriculture DTR in the vicinity of JGY / IND DTR

No bypassing of S.D.T. - In no case two phase power supply is given during load shedding on Ag. Dominant feeder.

Prepaid Meters:

MGVCL has taken initiative for installation of Prepaid Meters in the city and town areas in the year 2006-07. Initially, 250 Numbers of single phase Prepaid meters are purchased. These meters are installed in Baroda city and Umreth Town. Subsequently, under US-AID DRUM Project, further 50 Numbers of Prepaid meters are purchased in the year 2007-08 and installed. In all 300 Meters are at present operating.

As an innovative step, the State Government Tribal Department has sanctioned Rs.51 lacs for the purchase of Prepaid Meters to be installed in Tribal areas in the year 2008-09.

Electronic Meters:

As per the guidelines given by CEA to use Electronic Meter instead of electro-mechanical meters, MGVCL phase-wise have started purchasing single phase Electronic Meters.

All the 3 phase electro-mechanical meters are replaced with 3 Phase Static Meters. The single phase static meters are purchased with optical port to download the data. The meter also record total energy, i.e. fundamental + harmonics.

(2) Surveillance:

MGVCL has formed surveillance team consisting of 72 numbers of Corporate and field Engineers to have information of Theft and other irregularities adopted by various consumers. This helps in identifying theft prone consumers/areas which results in effective installation checking.

(3) Sub-Station Monitoring:

Study of ampere loading of each feeder according to the monthly/ seasonal consumption is prepared as well as total contracted load of each feeder is worked out. The loading of feeder should be in accordance with the contracted load. Accordingly, Bench marking of feeders is decided. These Bench Marks are reviewed periodically. Field Engineers are directed to visit the sub-stations regularly and study loading pattern of feeders. If it does not match the above condition, they are instructed to check the feeder for any irregularities i.e. tapping of power, etc.

(4) Qualitative Installation Checking:

Dedicated staff for vigilance activities is provided in each circle with Electronic Reference Standard Meter, (3 phase and 1 single phase) with class of accuracy 0.2.

- GUVNL, the holding company, has a vigilance wing headed by IG (Security), an IPS Officer. Under him about 50 teams are deployed with Ex-army men and Police Officers. The main function of the vigilance wing is to raid and to deal with strong-headed consumers and also installation checking as per the feed back given by the DISCOM.
- MGVCL has provided separate police station headed by Senior PSI and other staff for dealing with the power theft complaints as per Electricity Act, 2003.
- MGVCL has its own vigilance team headed by Additional Chief Engineer and other staff to curb the power theft. MGVCL has deployed about 300 Ex-Army personnel as well as Gunman to assist our vigilance team.
- Each circle vigilance team is provided with video camera and the engineers are provided with mobile phones with camera.
- AMR are provided to all the HT consumers and constantly monitored through Engineers in AMR Control Room in Corporate Office.
- Cross checking of meter reading energy bill book and wherever the consumption is found low or abnormal the surveillance is carried out.

ANNEXURE C Budget provision for Rural Sector by State Government

Table C.1: Budget Provision for Rural Sector Gujarat Year 2011 - 12

Sr.No.	Name of scheme	Target in Number	Estimated cost in Rs. Lacs
1	Electrification of Hutment (Zupada Vijlikaran) situated in Urban / Rural areas.	52800	4000
2	Kutir Jyoti bScheme.	14400	500
3	TASP (Tribal Area Sub Plan Scheme for House Hold Electrification)		
	PetaPara	150	20200
	Wells	11800	
4	TASP for 400 KV / 66 KV sub stations and its associated lines.		13000
5	SCSP (Schedule Cast Sub Plan		
	Scheduled Cast House hold	5000	
	Wells	1200	500
	Total		38200
* A provision of ` **83954.00** Lakhs is proposed for generation schemes for the year 2011-12 in the State Plan for Energy Sector. Of these 7.15% is estimated to benefit the scheduled caste on equitable basis.			
** More than 7.15% of the benefits will reach to the scheduled caste population against the provision of the ` **13000.00** Lakhs for transmission schemes for the year 2011-12.			

ANNEXURE D: Information of Energy Sector

Table D.1: Energy Sector Gujarat Year 2011 - 12

Sr.No.	Description	Proposed outlay Amount Rs. In Lacs
1	Thermal / Gas Generation	8825.98
2	New scheme for Generation GUVNL / GSECL	40000.00
3	T & D Scheme	21300.00
4	Rural Electrification Scheme	17440.00
5	RGGVY	0.02
6	Others	33201.00
7	Financial Restructuring Plan	25000.00
8	Coastal Area Development Plan	19688.00
9	Assistance to SPRERI	45.00
	Total Energy Sector	**173500.00**

Table D.2: GUVNL Plan Schedule Year 2011 - 12

Sr.No.	Description	Proposed outlay Amount Rs. In Lacs
1	Equity to GUVNL for new projects	7825.97
2	New scheme for Generation GUVNL / GSECL	40000.00
3	TASP for Sub Station / lines	18000.00
4	Electrification of Hutmens	2400.00
5	Kutir Jyoti scheme	900.00
6	TASP for Rural Rural Electrification wells & Petaparas	16940.00
7	Schedule Cast Sub Plan	500.00
8	RGGVY	0.02
9	Energy Conservation	2331.00
10	Financial Restructuring Plan	25000.00
11	Coastal Area Development Plan	17688.00
12	KHUSHY for PGVCL loan / Equity	10000.00
	Total GUVNL	**141584.99**

ANNEXURE E: List of Turnkey Contractors

RGGVY Projects-Districtwise	
Name of Dist	Agency
DGVCL	
Bharuch	PGCIL-SPIC - SUMO
Dang	Kiran Electricals-Surat
Narmada	PGCIL-SPIC - SUMO
Navsari	Sintex Ind. Ltd.-Kalol
Surat/Tapi	Sintex Ind. Ltd.-Kalol
Valsad	Sintex Ind. Ltd.-Kalol
MGVCL	
Anand	**Diamond Power Infrastructure Ltd.-Vadodara**
Dahod	W.S.Ind &Joint Venture -Chennai
Kheda	W.S.Ind &Joint Venture -Chennai
Panchmahal	Sintex Ind. Ltd.-Kalol
Vadodara	Diamond Power Infrastructure Ltd.-Vadodara
PGVCL	
Bhavnagar	Diamond Power Infrastructure Ltd.-Vadodara
Amreli	Gujarat Power Co.Ltd.-G"Nagar
Jamnagar	**Gujarat Power Co.Ltd.-G"Nagar**
Junagadh	Gujarat Power Co.Ltd.-G"Nagar
Kutchh	**Gujarat Power Co.Ltd.-G"Nagar**
Porbandar	Gujarat Power Co.Ltd.-G"Nagar
Rajkot	**Gujarat Power Co.Ltd.-G"Nagar**
S'Nagar	Gujarat Power Co.Ltd.-G"Nagar
UGVCL	
Ahmedabad	Diamond Power Infrastructure Ltd. & GP Prestress-G'Nagar
Banaskantha	Diamond Power Infrastructure Ltd.-Vadodara
Gandhinagar	Diamond Power Infrastructure Ltd.-Vadodara
Mehsana	Diamond Power Infrastructure Ltd.-Vadodara
Patan	Diamond Power Infrastructure Ltd.-Vadodara
Sabarkantha	**Diamond Power Infrastructure Ltd. & GP Prestress-G'Nagar**

Appendix F: Addendum following presentation made at MoP

During the series of presentation discussion with REC and presentation made at Ministry of Power several not clearly mentioned items were pointed out. Following are some of explanation for the same.

1. The District monitoring committee has been formed and regular meeting with Collector is taking place quarterly.
2. The total nos of Sub Station in Gujarat are managed by GETCO. In all blocks at least one substation is available, however in some blocks more than one substation exists. In RGVVY no substations are taken as they already existed before RGGVY scheme that also includes Jyoti Gram Yojana.
3. During augmentation of substation due care is taken for updating of switch gear also.
4. In UGVCL; total APL un-electrified connection as on 2008 was 207996, and total APL Connection 943989 was available. For APL the infrastructure is ready and whenever they apply they will get connections within one month if falling in "A" type category (link pole is near the household). Applications for APL connections are being received regularly and connections are being released in reasonable time period. GUVNL allocates number of APL connections to be released every financial Year. There is no segregation of APL RGGVY or any other scheme as the villages are already electrified. The advance planning for new connection is made by DISCOMs on the basis for connection released during previous five years records. Accordingly material is being procured to release connections. Normally connections are released within one month on making payment by consumers if falls in "A" (proximity to VEI) category. In case of other category consumers connections are released as per the Standard of Performance (time limit laid in consultation with GERC) as per Citizen Charter.
5. BPL connections are also being released in other State financed schemes parallel in order to achieve annual allocated target. The beneficiaries are staying in outskirts of village, and then they are to be released under Zupadpatti scheme.

Moreover, it is to be noted that, Ministry of Power and Central Electricity Authority has selected UGVCL, for **Gold Shield** for the year 2010-11 in the category of "Performance of Distribution Company". UGVCL has been recognized meritorious performance in Power Sector, on the base of Loss reduction from 16.96% to **6.63%** for the year 2010-11, Financial turn- around, 100% consumer metering, 81.75% DTC metering, best reliability of power supply by attending technical fault with minimum outage of 1.29 Hrs., lowest DT failure ratio just 9.0%. It is seen that, UGVCL company is providing best customer services for customer satisfaction. At & C losses is also at the minimum level, reliability of the power is also in the best position, billing and collection efficiency is also 100%,altogether puts the company in financial turn - around position.

Referring to Utilization of 8% of the sanction released for developing for service of infrastructure of DISCOM following response were obtained;

a. Manpower deployed by DISCOMs and structure of Manpower deployment for rural electrification. All the villages in our company have been already electrified before implementation of RGGVY project, with deployment of adequate manpower.
b. You may indicate district wise implementation time (as sub-station installation takes longer time than VEI of cluster of villages.). May indicate where forest clearance took a long time.

District wise Implementation time in the districts of UGVCL is as below.

Sr.No.	District	Work Order Issued date (Zero date)	Completion date	Implementation Time
1	Ahmedabad	16-05-08	30.11.11	42 Months
2	Banaskantha	26-05-08	Not completed	NA
3	Gandhinagar	05-01-09	31.03.11	27 Months
4	Mehsana	16-05-08	30.11.11	42 Months
5	Patan	16-05-08	30.11.11	42 Months
6	Sabarkantha	05-05-08	31.03.11	34 Months

a. In order to complete the project in prescribed milestone, the DISCOM executives feel that the works is to be carried out departmentally, because, the DISCOMs of state like Gujarat has potential to complete any challengeable job, and they have shown by executing JGY works in scheduled time frame.
b. The DISCOMs have streamlined the process of bill issue and revenue collection in the rural areas. Hence they feel that existing system may be permitted to continue. It will be worth-while to design franchisees at higher level defined by RGGVY Documents.

Gujarat state has elaborate T&D network and is developing each year. The status of the assigned districts as on 31/12/2011 is as below.

District wise sub-station in Gujarat as on 31/12/2011								
Sr.No.	District	400 KV	220 KV	132 KV	66 KV	33 KV	Total	Number of Blocks
3	Kutchh	1	6	2	65	0	74	
6	Jamnagar	0	1	4	54	0	59	
14	Rajkot	2	5	7	99	0	113	
17	Sabarkantha	0	3	2	57	0	62	

20	Ananad	1	1	2	23	0	37	
		11	76	48	1061	1	1197	

The grey areas in rural electrification in districts such as remote hamlets (Not observed in surveyed villages) are addressed by separate schemes as mentioned in the report. The Status of these schemes are shown in Table below

Schemewise Progress during the year 2011-2012 in Numbers

Sr.No.	Name of scheme	Target		Achivement	
		Physical	Financial	Physical	Financial
1	TASP well	2011	29850	13762	28310.24
2	TASP Petapara	150	900	146	1487.78
Electrification of Solar villages through conventional method					
3	TASP villages	48	1450	48	2402.55
TASP Transmission New S/S and line works (GETCO)					
4	TASP new S/S and line	15	16000		16023.57
Household connections					
5	Kutir Jyoti	14400	500	11953	507.74
6	SCSP(H/H)	6000	175	7376	210.89
7	Zupadpatti (General)	75000	6000	79248	5004.90
8	Normal well	61328	91990	16136	24618.37
9	Tatkal well	51000	76500	18976	55411.97

Franchisee deployed (Success or failure) or the village-wise revenue collection?

Village wise revenue collection efficiency is varies from 85 to 100%; details are given in the report.

Type of Franchisees in Gujarat

- Feeder Franchisee (Maintenance)
- E-Gram (Collection)
- Post Office (Collection)
- MEGA - Management of Electricity by Gram Associate (Collection based revenue franchisee)

District	No of Villages	Franchisee type	No. of operational franchisees	Number of villages covered
ANAND	350	POST OFFICE (OLLECTION)	313	350
		E-GRAM (COLLECTION)	350	350

Cost of services rendered by the agency for the task to be done by Franchisees

Activity	Unit	Rate in Rs.
Meter reading, bill preparation & delivery of bills	No	5
Disconnections/reconnections of consumers in arrears (to be paid after reconnection)	No	30
Removal of meter & service line	No	20
Replacement of faulty meters	No	10
Installation of metal meter boxes	No	25
Service line replacement	No	30
Removal of LT lines for PDC consumers	KM	175

The details of billing and revenue collection details of 5 villages of Anand and Sabarkantha district for month of May 2011 (information collected from circle office).The collection efficiency varies from 80 % to 100%.It is to clarify that the data are for month of May 2011, in which the collection amount may be for the same month or previous months arrear also.

Billing and Collection in 5 villages of MGVCL						
Anand District for May 11 in Ruppes						
Sr.No.	Particulars	Chuva	Devpura	Tarakpur	Changa	Khankhanpur
1	Average Monthly billing in Village Rs./Month	177038	22129	33445	676146	53083
2	Average Monthly Revenue Collection in Village Rs./Month	167436	22410	27970	601070	46958
3	Collection Efficiency	94.6	101.3	83.6	88.9	88.5

Data for Sabarkantha District

Billing and Collection in 5 villages of UGVCL						
Sabarkantha District						
Sr. No.	Particulars	Khumapur	Bamni	Dungragodh	Galisimro	Sabalvad
1	Average Monthly billing in Village Rs./Month	50000	57981	26410	48923	283050
2	Average Monthly Revenue Collection in Village Rs./Month	41000	46964	21414	57043	254745
3	Collection Efficiency	82.0	81.0	81.1	116.0	90.0

Challenges in Franchisees implementation

- Inadequate capacity to meet financial, administrative, regulatory requirements
- Shortage of skilled manpower
- Resistance from employee unions who may perceive it as back door privatization
- Inability to meet eventualities like accidents, natural calamities, disputes related to issues of service deficiencies

Way Forward

- Banks, financial institution may give financial guarantees on behalf of franchisee
- Franchisee capacity building through on hand training on various aspects of electricity transmission & distribution
- Skilled man-power can be provided on deputation to franchisee
- Insurance / guarantees by institutions on behalf of franchisee
- Taking all stakeholders on board & demonstrate likely benefits to all i.e. DISCOM, Customers, employees

Appendix G: Data Collected During the Study

Whether Electrification done as per DPR															
S.No.	State	Name of State/District	Name of Block	Name of Village	Category (UE/PE)	Quantity as per DPR				Quantity as per present survey				66/11 KVA Substation in the Block	
						DTs (In Nos.)	DT capacity	HT (in Ckt. Km.)	LT (in Ckt. Km.)	DTs (In Nos.)	DT capacity KVA (each)	HT (in Ckt. Km.)	LT (in Ckt. Km.)		
26	Gujarat	KACHCHH	Abdasa	Budadhro (00069000)	IE				0.13					Kotda J(8)	Ukheda
27	Gujarat		Bhuj	Vadvara (00042000)	IE				0.04					Dhaneti(17)	Dhaneti
28	Gujarat		Lakhpat	Naredo (00006400)	IE				0.11					Dayapar(4)	Baranda
29	Gujarat		Mandvi	Rajda (00084500)	IE				0.27					Don(7)	Sherdi
30	Gujarat		Nakhatrana	Naranpar (00060000)	IE				0.19					Nakhatrana (11)	Nilkanth

31	Gujarat	ANAND	Anklav	Devapura (0107850 0)	IE				0.36				0.36	11 KV Bamangam Jyoti gram feeder	66/11 KV Anklav
32	Gujarat		Borsad	Chuva (0107170 0)	IE				0.68				0.68	11 KV Chuva Jyoti gram feeder	66/11 KV Ras
33	Gujarat		Khambhat	Tarakpur (0106580 0)	IE				1.28				1.28	11 KV Golana Jyoti gram feeder	66/11 KV Neja
34	Gujarat		Petlad	Changa (0105820 0)	IE				2.5				4.68	11 KV Changa Jyoti gram feeder	66/11 KV Changa
35	Gujarat		Umreth	Khankhanpur (0105180 0)	IE				0.8				1.445	11 KV Sureli Jyoti gram feeder	132/11 KV Ode
36	Gujarat	JAMNAGAR	Dhrol	Haripar (0073830 0)	IE				0.41					MANEKPAR JGY	DHROL(6)
37	Gujarat		Kalyanpur	Premsar (0076460 0)	IE				0.41					DANGARVAD	GORANA (6)
38	Gujarat		Khambhalia	Pipriya (0071720 0)	IE	1	16	0.5	0.31					THAKAR SERDI	Bhadthar(9)
39	Gujarat		Lalpur	Khatiya (0075710 0)	IE	1	16	1.2	1.28					M.LAKHIAYA JGY	66KV MEGHPAR(11)
40	Gujarat		Okhamandal	Padli (0070490 0)	IE				0.35					Padli	Arambhda(3)
41	Gujarat	SABARKANTHA	Modasa	Khumapur (0043680 0)	IE	1	16	0.00	0.96			0.00	0.08	11 KV Khumapur Jtoti gram feeder	66/11 KV Modas
42	Gujarat		Malpur	Bamni (0045540 0)	IE			1.91	2.31			0.12	2.31	11 KV Dabaran Jyoti gram feeder	66/11 KV Ramgadhi
43	Gujarat		Meghraj	Dungragod (0040320 0)	IE			0.84	1.29			0.84	1.29	11 KV Bathiwadi Jyoti gram feeder	66/11 KV Rajpur Ramgadhi

44	Gujarat		Bhiloda	Gali Semro (0038810 0)	IE			1.91	9.31			1.91	9.31	11 KV Rellawada Jyoti gram feeder	66/11 KV Rellawada
45	Gujarat		Idar	Sabalvad (0036090 0)	IE			0.00	0.88			0.00	0.88	11 KV Umedpura Jyoti gram feeder	66/11 KV Ranasan
46	Gujarat	RAJKOT	Dhoraji	Udakiya (0069900 0)	IE				0.4					Moti Marad	66 KV MOTIMARAD(9)
47	Gujarat		Maliya	Jajasar (0062010 0)	IE	2	25	2	4					11 KV Maliya	66 KV Pipaliya(3)
48	Gujarat		Morvi	Haripar (0062650 0)	IE	0	0	0	0					Haripar	Morbi A(7)
49	Gujarat		Tankara	Otala (0063420 0)	IE	2	16	2	4					Bangavdi	Tankara(4)
50	Gujarat		Wankaner	Pipardi (0064540 0)	IE			0	0					Panchdwarka	Wankaner(8)
Gujarat	**Total**														

Whether Electrification done as per DPR																			
S.No.		**Name of State/District**	**Name of Block**	**Name of Village**	**Category (UE/PE)**	**Nos. of HHs in a Village at the time of present survey**			**Nos. of HHs covered under RGGVY (as per DPR)**			**Nos. of HHs actully electrified at the time of present survey**				**Reasons for difference/gap**	**Nos. of HHs energised**		
	State					**No. of BPL**	**No. of APL**	**Total**	**No. of BPL**	**No. of APL**	**Total**	**No. of BPL**	**Other BPL**	**No. of APL**	**Total**		**No. of BPL**	**No. of APL**	**Total**

						s	s		s	s		s		s			s	s	
26	Gujarat	KACHCHH	Abdasa	Budadhro (00069000)	IE	11		43	11			4		0	4		4		4
27	Gujarat		Bhuj	Vadvara (00042000)	IE	3		44	3			1		0	1		1		1
28	Gujarat		Lakhpat	Naredo (00006400)	IE	1		24	7			1		0	1		1		1
29	Gujarat		Mandvi	Rajda (00084500)	IE	1		47	23			1		0	1		1		1
30	Gujarat		Nakhatrana	Naranpar (00060000)	IE	1		75	16			1		0	1		1		1
31	Gujarat	ANAND	Anklav	Devapura (01078500)	IE	12		128	18		59	3	12	3	18		3		15
32	Gujarat		Borsad	Chuva (01071700)	IE	17		862	237		401	17	6	0	23	Other BPL connection is the connections released under different State Government schemes.	17		23
33	Gujarat		Khambhat	Tarakpur (01065800)	IE	32		155	28		64	32	7	0	39		32		39
34	Gujarat		Petlad	Changa (01058200)	IE	117		1334	17		75	111	0		111		111		111

35	Gujarat		Umreth	Khankhanpur (01051800)	IE	29		513	161		195	30	0		30		30		30
36	Gujarat	JAMNAGAR	Dhrol	Haripar (00738300)	IE	2		142	12		16	2		1	3		2	1	3
37	Gujarat		Kalyanpur	Premsar (00764600)	IE	13		46	12		16	13			13		13		13
38	Gujarat		Khambhalia	Pipriya (00717200)	IE	15		78	9		22	8			8		8		8
39	Gujarat		Lalpur	Khatiya (00757100)	IE	32		221	37		43	9			9		9		9
40	Gujarat		Okhamandal	Padli (00704900)	IE	7		78	10		32	7			7		7		7
41	Gujarat	SABARKANTHA	Modasa	Khumapur (00436800)	IE	19		243	144		149	19	0		19		19		19
42	Gujarat		Malpur	Bamni (00455400)	IE	45		174	7		7	60	4		64		45		49
43	Gujarat		Meghraj	Dungragod (00403200)	IE	32		113	84		84	32	0		32		32		32

44	Gujarat		Bhiloda	Gali Semro (00388100)	IE	130		300	49		49	130	1		131		130		131
45	Gujarat		Idar	Sabalvad (00360900)	IE	8		601	10		16	8	0	2	10		8		8
46	Gujarat	RAJKOT	Dhoraji	Udakiya (00699000)	IE	5		156	5		15	2			2		2		2
47	Gujarat		Maliya	Jajasar (00620100)	IE	29		344	21		21	21			21		21		21
48	Gujarat		Morvi	Haripar (00626500)	IE	5		199	5		5	5			5		5		5
49	Gujarat		Tankara	Otala (00634200)	IE	3		436	3		3	3			3		3		3
50	Gujarat		Wankaner	Pipardi (00645400)	IE	2		571	1		1	1			1		1		1
Gujarat	**Total**					**571**	**0**	**6927**	**930**		**1273**	**521**	**30**	**6**	**557**		**506**	**1**	**537**

Whether Electrification done as per DPR																			

S.No.	State	Name of State/District	Name of Block	Name of Village	Category (UE/PE)		No of Households	No of Hamlets	Nos. of Hamlets with population				Details of Hamlets in a Village at the time of present survey				Details of Hamlets covered under RGGVY (as per DPR)		
									0-100	100-300	above 300	Total	Population of Hamlet	No. of BPL HHs in Hamlets	No. of APL HHs in Hamlets	Total	No. of BPL HHs	No. of APL HHs	Total
26	Gujarat	KACHCHH	Abdasa	Budadhro (00069000)	IE	46	`NIL												
27	Gujarat		Bhuj	Vadvara (00042000)	IE	60	`NIL												
28	Gujarat		Lakhpat	Naredo (00006400)	IE	25	`NIL												
29	Gujarat		Mandvi	Rajda (00084500)	IE	53	`NIL												
30	Gujarat		Nakhatrana	Naranpar (00060000)	IE	56	`NIL												
31	Gujarat	ANAND	Anklav	Devapura (01078500)	IE	Devapura (01078500)	IE		3	1	1			1	10	3	0	3	3

32	Gujarat		Borsad	Chuva (01071700)	IE		17	1	1			1	85	17	0	17	17	0	17
33	Gujarat		Khambhat	Tarakpur (01065800)	IE		32	2	2			2	100	32	0	32	32	0	32
34	Gujarat		Petlad	Changa (01058200)	IE		111	2	2			2	500	111	0	111	111	0	111
35	Gujarat		Umreth	Khankhanpur (01051800)	IE		30	1	1			1	110	30	0	30	30	0	30
36	Gujarat	JAMNAGAR	Dhrol	Haripar (00738300)	IE	630	`NIL												
37	Gujarat		Kalyanpur	Premsar (00764600)	IE	125	`NIL												
38	Gujarat		Khambhalia	Pipriya (00717200)	IE	63	`NIL												
39	Gujarat		Lalpur	Khatiya (00757100)	IE	813	`NIL												
40	Gujarat		Okhamandal	Padli (00704900)	IE	45	`NIL												
41	Gujarat	SABARKANTHA	Modasa	Khumapur (00436800)	IE	IE	238	0	_	_	_	_	_	_	_	_	_	_	_

42	Gujarat		Malpur	Bamni (00455400)	IE	IE	220	0	_	_	_	_	_	_	_	_	_	_	_
43	Gujarat		Meghraj	Dungragod (00403200)	IE	IE	118	0	_	_	_	_	_	_	_	_	_	_	_
44	Gujarat		Bhiloda	Gali Semro (00388100)	IE	IE	248	0	_	_	_	_	_	_	_	_	_	_	_
45	Gujarat		Idar	Sabalvad (00360900)	IE	IE	710	1	_	_	1	1	425	0	95	95	0	95	95
46	Gujarat	RAJKOT	Dhoraji	Udakiya (00699000)	IE		176	`NIL											
47	Gujarat		Maliya	Jajasar (00620100)	IE		153	`NIL											
48	Gujarat		Morvi	Haripar (00626500)	IE		132	`NIL											
49	Gujarat		Tankara	Otala (00634200)	IE		531	`NIL											
50	Gujarat		Wankaner	Pipardi (00645400)	IE		45	`NIL											

Electrificaiton of Public Places										
S.No.	**Name of State/District**	**Name of Block**	**Name of Village**	**Category (UE/PE)**	**No. of Public places in Village at the time of present survey**				**No. public places having electricity before RGGVY**	**No. public places having electricity after RGGVY**
					School	**Health Center**	**Community Center**	**Total**		
1	Anand				14	2		16	16	
		Anklav	Devapura (01078500)		1	0	0	1	1	
		Borsad	Chuva (01071700)		5	1		6	6	
		Khambhat	Tarakpur (01065800)		1			1	1	
		Petlad	Changa (01058200)		5 + 1*	1		7	7	
		Umreth	Khankhanpur (01051800)		2			3	3	
2	Sabarkantha				6	1		7	7	

		Modasa	Khumapur (00436800)		1			1	1	
		Malpur	Bamni (00455400)		1			1	1	
		Meghraj	Dungragod (00403200)		1			1	1	
		Bhiloda	Gali Semro (00388100)		1			1	1	
		Idar	Sabalvad (00360900)		2	1		3	3	
3	Rajkot				5			5		
		Dhoraji	Udakiya (00699000)							
		Maliya	Jajasar (00620100)							
		Morvi	Haripar (00626500)							
		Tankara	Otala (00634200)							

		Wankaner	Pipardi (00645400)							
4	Kutchh				4	1		5		5
		Abdasa	Budadhro (00069000)							
		Bhuj	Vadvara (00042000)							
		Lakhpat	Naredo (00006400)							
		Mandvi	Rajda (00084500)							
		Nakhatrana	Naranpar (00060000)							
5	Jamnagar				5			5		5
		Dhrol	Haripar (00738300)							
		Kalyanpur	Premsar (00764600)							
		Khambhalia	Pipriya (00717200)							
		Lalpur	Khatiya (00757100)							

		Okhamandal	Padli (00704900)							

Adequacy of completion schedule, causes of delays										
S.No.	**State**	**Name of District / DPR Sanction date**	**Name of Block**	**Name of Village**	**Award Based on Substation**	**Date of Award/ DPR Sanction Date**	**Scheduled Completion time (in mths)**	**Actual Completion Time (in mths)**	**Delay (in Mths)**	**Reasons for Delay**
26	Gujarat	KACHCHH22-01-2008	Abdasa	Budadhro (00069000)	**NA**	27.11.2009	**24-Months**	**30.01.2012**	**2**	
27	Gujarat		Bhuj	Vadvara (00042000)	**NA**	27.11.2009	**24-Months**	**30.01.2012**	**2**	
28	Gujarat		Lakhpat	Naredo (00006400)	**NA**	27.11.2009	**24-Months**	**30.01.2012**	**2**	
29	Gujarat		Mandvi	Rajda (00084500)	**NA**	27.11.2009	**24-Months**	**30.01.2012**	**2**	
30	Gujarat		Nakhatrana	Naranpar (00060000)	**NA**	27.11.2009	**24-Months**	**30.01.2012**	**2**	
31	Gujarat	ANAND 05-03-2008	Anklav	Devapura (01078500)	19.03.2007	19.03.2007	22	48	26	add BPL H/hs release to indira awas,and

										scattered area
32	Gujarat		Borsad	Chuva (01071700)	19.03.2007	19.03.2007	22	48	26	add BPL H/hs release to indira awas,and scattered area
33	Gujarat		Khambhat	Tarakpur (01065800)	19.03.2007	19.03.2007	22	48	26	add BPL H/hs release to indira awas,and scattered area
34	Gujarat		Petlad	Changa (01058200)	19.03.2007	19.03.2007	22	48	26	add BPL H/hs release to indira awas,and scattered area
35	Gujarat		Umreth	Khankhanpur (01051800)	19.03.2007	19.03.2007	22	48	26	add BPL H/hs release to indira awas,and scattered area

36	Gujarat	JAMNAGAR 05-03-2008	Dhrol	Haripar (00738300)	**NA**	27.11.2009	**24-Months**	**30.11.2011**	**0**	
37	Gujarat		Kalyanpur	Premsar (00764600)	**NA**	27.11.2009	**24-Months**	**30.11.2011**	**0**	
38	Gujarat		Khambhalia	Pipriya (00717200)	**NA**	27.11.2009	**24-Months**	**30.11.2011**	**0**	
39	Gujarat		Lalpur	Khatiya (00757100)	**NA**	27.11.2009	**24-Months**	**30.11.2011**	**0**	
40	Gujarat		Okhamandal	Padli (00704900)	**NA**	27.11.2009	**24-Months**	**30.11.2011**	**0**	
41	Gujarat	SABARKANTHA 22-01-2008	Modasa	Khumapur (00436800)	No substation coverage in award	06.03.2008	24 months	31.03.2011	12 Months	Due to hilly, reserve forest and scattered area
42	Gujarat		Malpur	Bamni (00455400)	No substation coverage in award	06.03.2008	24 months	31.03.2011	12 Months	Due to hilly, reserve forest and scattered area
43	Gujarat		Meghraj	Dungragod (00403200)	No substation coverage in award	06.03.2008	24 months	31.03.2011	12 Months	Due to hilly, reserve forest and scattered area
44	Gujarat		Bhiloda	Gali Semro (00388100)	No substation coverage in award	06.03.2008	24 months	31.03.2011	12 Months	Due to hilly, reserve forest and

										scattered area
45	Gujarat		Idar	Sabalvad (00360900)	No substation coverage in award	06.03.2008	24 months	31.03.2011	12 Months	Due to hilly, reserve forest and scattered area
46	Gujarat	RAJKOT 05-03-2008	Dhoraji	Udakiya (00699000)	**NA**	23.11.2009	**24-Months**	**30.11.2011**	**0**	
47	Gujarat		Maliya	Jajasar (00620100)	**NA**	23.11.2009	**24-Months**	**30.11.2011**	**0**	
48	Gujarat		Morvi	Haripar (00626500)	**NA**	23.11.2009	**24-Months**	**30.11.2011**	**0**	
49	Gujarat		Tankara	Otala (00634200)	**NA**	23.11.2009	**24-Months**	**30.11.2011**	**0**	
50	Gujarat		Wankaner	Pipardi (00645400)	**NA**	23.11.2009	**24-Months**	**30.11.2011**	**0**	
Gujarat	**Total**									

Impact of RGGVY on release of APL connection by Utility, augmentation of DT capacity											

S.No.	State	Name of State/District	Name of Block	Name of Village	Category (UE/PE)	RHH	No. of APL HHs at the time of Survey	APL connections before RGGVY	APL connections after RGGVY	APL HHs not applied for connection	APL HHs applied for connection but not released
26	Gujarat	KACHCHH	Abdasa	Budadhro (00069000)	IE	46	42	42	42	NA	NA
27	Gujarat		Bhuj	Vadvara (00042000)	IE	60	59	59	59	NA	NA
28	Gujarat		Lakhpat	Naredo (00006400)	IE	25	24	24	24	NA	NA
29	Gujarat		Mandvi	Rajda (00084500)	IE	53	52	52	52	NA	NA
30	Gujarat		Nakhatrana	Naranpar (00060000)	IE	56	55	55	55	NA	NA
						240	232	232	232		
31	Gujarat	ANAND	Anklav	Devapura (01078500)	IE	0	0	0	0	NA	NA
32	Gujarat		Borsad	Chuva (01071700)	IE	0	0	0	0	NA	NA
33	Gujarat		Khambhat	Tarakpur (01065800)	IE	0	0	0	0	NA	NA
34	Gujarat		Petlad	Changa (01058200)	IE	0	0	0	0	NA	NA

35	Gujarat		Umreth	Khankhanpur (01051800)	IE	0	0	0	0	NA	NA
36	Gujarat	JAMNAGAR	Dhrol	Haripar (00738300)	IE	630	240	240	265	NA	NA
37	Gujarat		Kalyanpur	Premsar (00764600)	IE	125	33	37	42	NA	NA
38	Gujarat		Khambhalia	Pipriya (00717200)	IE	63	45	49	55	NA	NA
39	Gujarat		Lalpur	Khatiya (00757100)	IE	813	151	167	183	NA	NA
40	Gujarat		Okhamandal	Padli (00704900)	IE	45	25	29	32	NA	NA
						1676	494	522	577		
41	Gujarat	SABARKANTHA	Modasa	Khumapur (00436800)	IE	238	158	158	158	NA	NA
42	Gujarat		Malpur	Bamni (00455400)	IE	220	71	71	71	NA	NA
43	Gujarat		Meghraj	Dungragod (00403200)	IE	118	50	50	50	NA	NA
44	Gujarat		Bhiloda	Gali Semro (00388100)	IE	248	116	116	116	NA	NA
45	Gujarat		Idar	Sabalvad (00360900)	IE	805	780	770	805	NA	NA
						1629	1175	1165	1200		
46	Gujarat	RAJKOT	Dhoraji	Udakiya (00699000)	IE	176	155	155	176	NA	NA
47	Gujarat		Maliya	Jajasar (00620100)	IE	153	142	142	153	NA	NA
48	Gujarat		Morvi	Haripar (00626500)	IE	132	127	127	132	NA	NA

49	Gujarat		Tankara	Otala (00634200)	IE	531	528	528	531	NA	NA
50	Gujarat		Wankaner	Pipardi (00645400)	IE	45	40	40	45	NA	NA
						1037	992	992	1037		
Gujarat	**Total**										

Franchisee Models

S.No.	State	Name of State/District	Name of Block	Name of Village	franchisee appointed (Yes/No)	Name of Franchisee	Date of Appointment	Type of Franchisee (model used)	Franchisee appointed before RGGVY (Y/N)	Franchisee appointed after RGGVY (Y/N)	Reason for not appointment of franchisee	Remarks (improvement brought by franchisee like better quality of power, reduction in AT&C losses etc.)
26	Gujarat	KACHCHH	Abdasa	Budadhro (00069000)	Yes	e-mitra		Revenue Collection	Yes	No		
27	Gujarat		Bhuj	Vadvara (00042000)	Yes	Yes		Revenue Collection	Yes	No		
28	Gujarat		Lakhpat	Naredo (00006400)	Yes	Yes		Revenue Collection	Yes	No		
29	Gujarat		Mandvi	Rajda (00084500)	Yes	e-mitra		Revenue Collection	Yes	No		

30	Gujarat		Nakhatrana	Naranpar (00060000)	Yes	e-mitra		Revenue Collection	Yes	No		
31	Gujarat	ANAND	Anklav	Devapura (01078500)	e-mitra	rev franchisee	Nov-07	rev franchisee	N	Y	NA	NA
32	Gujarat		Borsad	Chuva (01071700)	e-mitra	rev franchisee	Nov-07	rev franchisee	N	Y	NA	NA
33	Gujarat		Khambhat	Tarakpur (01065800)	e-mitra	rev franchisee	Nov-07	rev franchisee	N	Y	NA	NA
34	Gujarat		Petlad	Changa (01058200)	e-mitra	rev franchisee	Nov-07	rev franchisee	N	Y	NA	NA
35	Gujarat		Umreth	Khankhanpur (01051800)	e-mitra	rev franchisee	Nov-07	rev franchisee	N	Y	NA	NA
36	Gujarat	JAMNAGAR	Dhrol	Haripar (00738300)	YES	e-Gram		Revenue Collection	Yes	No		
37	Gujarat		Kalyanpur	Premsar (00764600)	YES	POST OFFICE		Revenue Collection	Yes	No		
38	Gujarat		Khambhalia	Pipriya (00717200)	YES	POST OFFICE		Revenue Collection	Yes	No		
39	Gujarat		Lalpur	Khatiya (00757100)	YES	POST OFFICE		Revenue Collection	Yes	No		

40	Gujarat		Okhamandal	Padli (00704900)	YES	POST OFFICE		Revenue Collection	Yes	No		
41	Gujarat	SABARKANTHA	Modasa	Khumapur (00436800)	No (e-mitra)	-	-	-	-	-	-	-
42	Gujarat		Malpur	Bamni (00455400)	No	-	-	-	-	-	-	-
43	Gujarat		Meghraj	Dungragod (00403200)	No	-	-	-	-	-	-	-
44	Gujarat		Bhiloda	Gali Semro (00388100)	No	-	-	-	-	-	-	-
45	Gujarat		Idar	Sabalvad (00360900)	No	-	-	-	-	-	-	-
46	Gujarat	RAJKOT	Dhoraji	Udakiya (00699000)	Yes	yes		Revenue Collection	Yes	No		
47	Gujarat		Maliya	Jajasar (00620100)	Yes	POST OFFICE		Revenue Collection	Yes	No		
48	Gujarat		Morvi	Haripar (00626500)	Yes	POST OFFICE		Revenue Collection	Yes	No		

49	Gujarat		Tankara	Otala (00634200)	Yes	POST OFFICE		Revenue Collection	Yes	No		
50	Gujarat		Wankaner	Pipardi (00645400)	**No**							
Gujarat	**Total**											

Billing to and payment by BPL and APL consumer

S.No.	State	Name of State/District	Name of Block	Name of Village	Time taken in release of first Bill in Month	Average Amt. of first Bill	Periodicity of Subsequent Bills	Energy Billed in Units	Average Amount every two months	Reason for Delay	Bills paid on time	Delay in Bill Payment (in mths)	Reason for Delay
26	Gujarat	KACHCHH	Abdasa	Budadhro (00069000)	N.A.	N.A.	BI MONTHLY		175		YES	NO	N.A
27	Gujarat		Bhuj	Vadvara (00042000)	N.A.	N.A.	BI MONTHLY		200		YES	NO	N.A
28	Gujarat		Lakhpat	Naredo (00006400)	N.A.	N.A.	BI MONTHLY		175		YES	NO	N.A
29	Gujarat		Mandvi	Rajda (00084500)	N.A.	N.A.	BI MONTHLY		180		YES	NO	N.A
30	Gujarat		Nakhatrana	Naranpar (00060000)	N.A.	N.A.	BI MONTHLY		175		YES	NO	N.A

31	Gujarat	ANAND	Anklav	Devapura (01078500)	45days	40units	2months	150	NA	Y	NA	NA
32	Gujarat		Borsad	Chuva (01071700)	45days	40units	2months	150	NA	Y	NA	NA
33	Gujarat		Khambhat	Tarakpur (01065800)	45days	40units	2months	150	NA	Y	NA	NA
34	Gujarat		Petlad	Changa (01058200)	45days	40units	2months	150	NA	Y	NA	NA
35	Gujarat		Umreth	Khankhanpur (01051800)	45days	40units	2months	150	NA	Y	NA	NA
36	Gujarat	JAMNAGAR	Dhrol	Haripar (00738300)	N.A.	N.A.	BI MONTHLY	262	_	YES	N.A.	N.A
37	Gujarat		Kalyanpur	Premsar (00764600)	N.A.	N.A.	BI MONTHLY	240	_	YES	N.A.	N.A
38	Gujarat		Khambhalia	Pipriya (00717200)	N.A.	N.A.	BI MONTHLY	270	_	YES	N.A.	N.A
39	Gujarat		Lalpur	Khatiya (00757100)	N.A.	N.A.	BI MONTHLY	97	_	YES	N.A.	N.A
40	Gujarat		Okhamandal	Padli (00704900)	N.A.	N.A.	BI MONTHLY	467	_	YES	N.A.	N.A
41	Gujarat	SABARKANTHA	Modasa	Khumapur (00436800)	60 DAYS	204	60 DAYS	218	NA	YES	NA	NA
42	Gujarat		Malpur	Bamni (00455400)	60 DAYS	240	60 DAYS	263	NA	YES	NA	NA
43	Gujarat		Meghraj	Dungragod (00403200)	60 DAYS	210	60 DAYS	223	NA	YES	NA	NA
44	Gujarat		Bhiloda	Gali Semro (00388100)	60 DAYS	185	60 DAYS	197	NA	YES	NA	NA
45	Gujarat		Idar	Sabalvad (00360900)	60 DAYS	250	60 DAYS	700	NA	YES	NA	NA

46	Gujarat	RAJKOT	Dhoraji	Udakiya (00699000)	N.A.	N.A.	BI MONTHLY						
47	Gujarat		Maliya	Jajasar (00620100)	N.A.	N.A.	BI MONTHLY		310	-	YES	N.A.	N.A.
48	Gujarat		Morvi	Haripar (00626500)	N.A.	N.A.	BI MONTHLY		358	-	YES	N.A.	N.A.
49	Gujarat		Tankara	Otala (00634200)	N.A.	N.A.	BI MONTHLY		699	-	YES	N.A.	N.A.
50	Gujarat		Wankaner	Pipardi (00645400)	N.A.	N.A.	BI MONTHLY		570	-	YES	N.A.	N.A.
Gujarat	**Total**												

Sl. No.	State/Discom	2007-08		2008-09		2009-10	
		Agricultural Revenue		Agricultural Revenue		Agricultural Revenue	
		Rs. Crores	Rs./Kwh	Rs. Crores	Rs./Kwh	Rs. Crores	Rs./Kwh
5	Gujarat						
	DGVCL	61	1.15	101	1.89	98	1.72
	MGVCL	79	1.06	195	2.39	145	1.59
	PGVCL	470	1.17	810	1.89	807	1.75
	UGVCL	658	1.13	1132	1.86	1146	1.7

		Commercial loss w/o subsidy	Subsidy	cost of Supply	Average Tariff	AT & C Losses	Agriculture consumption	Agri. Tariff

		2008-09 (Prov)	2009-10 RE	2008-09 (Prov)	2009-10 RE	2008-09 (Prov)	2009-10 RE	2008-09 (Prov)	2009-10 RE	2008-09 (Prov)	2009-10 RE	2008-09 (Prov)	2009-10 RE	2008-09 (Prov)	2009-10 RE
2	Gujarat	949	875	1,100.00	1,100.00	464.25	441	417.84	394.65	25.46	23.81	27.3	28.62	1.97	1.82

Availability of extra power with the State for RGGVY villages

Electricity Demand Projection[1]

	Electrical Energy Requirement (GWh)			Peak Electrical Load (MW)		
States	2011-12	2016-17	2021-22	2011-12	2016-17	2021-22
Gujarat	85445	119083	156842	14374	19670	25447
Total all India	968659	1392066	1914508	152746	218209	298253

[1] http://www.scribd.com/doc/57505120/17th-Electric-Power-Survey-Report (Central Electricity Authority Report)

	Electrical Energy Requirement (GWh)			Peak Electrical Load (MW)		
States	2011-12	2016-17	2021-22	2011-12	2016-17	2021-22
Gujarat	85445	119083	156842	14374	19670	25447
Total all India	968659	1392066	1914508	152746	218209	298253

Backward Linkage Information of the District Kachchh, Jamnagar, Rajkot

Name of the State	**Name of the District**		**Name of the Block**	**Name of the Village (Census Code)**		Name of concerned 11kv Feeder	Name of feeding 66/11/kv Sub-station	Total Nos. of APL HHs Pending Application for electrification	Total Nos. of BPL HHs Pending for electrification	Total 66KV S/S in this Block
5. Gujarat	1	KACHCHH	Abdasa	1	Budadhro (00069000)	Ukheda	Kotda J	0	0	8
			Bhuj	2	Vadvara (00042000)	Dhaneti	Dhaneti	0	0	17
			Lakhpat	3	Naredo (00006400)	Baranda	Dayapar	0	0	4
			Mandvi	4	Rajda (00084500)	Sherdi	Don	0	0	7
			Nakhatrana	5	Naranpar (00060000)	Nilkanth	Nakhatrana	0	0	11
	3	JAMNAGAR	Dhrol	1	Haripar (00738300)	MANEKPAR JGY	DHROL	0	0	6
			Kalyanpur	2	Premsar (00764600)	DANGARVAD	GORANA	0	0	6
			Khambhalia	3	Pipriya (00717200)	THAKAR SERDI	Bhadthar	0	0	9
			Lalpur	4	Khatiya (00757100)	M.LAKHIAYA JGY	66KV MEGHPAR	0	0	11
			Okhamandal	5	Padli (00704900)	Padli	Arambhda	0	0	3
	5	RAJKOT	Dhoraji	1	Udakiya (00699000)	Moti Marad	66 KV MOTIMARAD	0	0	9.00
			Maliya	2	Jajasar (00620100)	11 KV Maliya	66 KV Pipaliya	0	0	3

			Morvi	3	Haripar (00626500)	Haripar	Morbi A	0	0	7
			Tankara	4	Otala (00634200)	Bangavdi	Tankara	0	0	4
			Wankaner	5	Pipardi (00645400)	Panchdwarka	Wankaner	0	0	8
Total	**Districts: 3**		**Blocks: 15**	**Villages: 15**						

BPL Statistics of Village Surveyed		
Budadhro (00069000)	3	15
Vadvara (00042000)		1
Naredo (00006400)		1
Rajda (00084500)		
Naranpar (00060000)		1
Devapura (01078500)	12	44
Chuva (01071700)	193	498
Tarakpur (01065800)	69	123
Changa (01058200)	168	511
Khankhanpur (01051800)	168	527
Haripar (00738300)	6	19
Premsar (00764600)		6
Pipriya (00717200)		1
Khatiya (00757100)	26	74
Padli (00704900)	15	23
Khumapur (00436800)	9	57
Bamni (00455400)	15	96
Dungragod (00403200)	14	68
Gali Semro (00388100)	47	202
Sabalvad (00360900)	27	127
Udakiya (00699000)		
Jajasar (00620100)	16	80
Haripar (00626500)		9
Otala (00634200)	12	32
Pipardi (00645400)	12	22
		2537

Question:
When we report 100% electrification in Gujarat, why we have new connections and for whom?

H/H Electrification in Gujarat during Year 2011-12				
Sr. No.	DISCOMs	Total Nos. of H/H Electrified	BPL H/H Electrified Under (Central & State) Govt. Schemes	H/H Electrified Under Normal Development
1	DGVCL	69334	43896	25438
2	MGVCL	85057	67656	17401
3	UGVCL	84711	48882	35829
4	PGVCL	131403	45302	86101
	TOTAL	**370505**	**205736**	**164769**

Reason:
Under RGGVY project, 100% electrification of BPL beneficiaries has been in verge of completion as per the sanctioned project DPRs. other BPL beneficiaries have been covered as per the applications received/ lists received from local authorities and such lists have been exhausted.

Along with the increasing population, Number of BPL families are also increasing due to various reasons like, separation of families, allocations of New Awas under various Govt. Scheme etc. Also, recently Govt. of Gujarat has enhanced annual income criteria for the BPL beneficiaries vide G.R. No. RES/1094/4403/K 1 dated 18.06.2012 (i) For Rural area annual income criteria Rs. 27,000/- against previous limit of Rs. 11,000/- and (ii) For Urban area annual income criteria Rs. 36,000/- against previous limit of Rs. 11,000/- etc.

Also Normal Development through general categories applicant also demanding connections for their new H/H.

Report on Evaluation of Rajiv Gandhi Grameen Vidyutikaran Yojana (RGGVY) in the state of Himachal Pradesh

Submitted to:
Rural Electrification Corporation (REC), New Delhi

Submitted By:
Integrated Research and Action for Development (IRADe), C-80, Shivalik, New Delhi-110017

Evaluation of the Rajiv Gandhi Grameen Vidyutikaran Yojana (RGGVY) Programme: State of Himachal Pradesh

Submitted to: Rural Electrification Corporation (REC)

Submitted By: Integrated Research and Action for Development (IRADe)
C-80 Shivalik, New Delhi - 110017

May 2012

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Executive Summary Evaluation of "Rajiv Gandhi Grameen Vidyutikaran Yojana" (RGGVY) Programme in the state of Himachal Pradesh

The Government of Himachal Pradesh has been effective in developing electricity infrastructure in the state under RGGVY programme that has sustained continuous economic growth. Himachal Pradesh is a hilly state with about 50% area in mountainous region featuring high altitudes, snow clad for about 3 to 8 months in the years; especially in the district of Chamba, Lahaul and Spiti, Kinnaur. River water of the state has been harnessed for generating hydropower, and share of that has been channelized to consumers in rural areas of Himachal Pradesh. As per the earlier definition of rural electrification; the most of the rural areas of Himachal Pradesh were declared electrified in the year 1988. But the benefit of electrification did not reach (a) the BPL population and (b) remote villages located in difficult terrains. The state government saw RGGVY programme as an opportunity to strengthen the rural electricity network to boost rural economy, addressing commitment to social justice and diversifying economic activities and generating livelihoods.

Himachal Pradesh State Electricity Board (HPSEB) has not been unbundled as suggested in the Electricity Act 2003. HPSEB has an independent RGGVY department headed by Director. They have separate office and have effective link with each distribution circle.

The study was planned to be executed with stakeholders' interaction and survey of the rural areas where RGGVY programme has been undertaken. The sample villages suggested by REC were in the districts Mandi, Una, Hamirpur, Chamba, Lahaul and Spiti. The RGGVY programme is executed by Himachal Pradesh State Electricity Board, through their department for rural electrification.

1. **Progress of village electrification as per the approved DPR**

The implementation of RGGVY programme in the districts is executed by the turnkey contractors according to a Detailed Project Report (DPR). Initial DPR is prepared by Himachal Pradesh State Electricity Board (HPSEB), and that is processed by REC for approval of sanction. Turnkey contractors are the Project Implementation Agencies (PIAs); and they update and prepare revised DPR. The DPRs cover, for providing infrastructure for releasing connection to scattered households, infrastructure systems that include 33/11 KV //

66/22 KVA substations, distribution transformers (DT 33/11 KVA & 66/22 KVA), High tension/ Low tension lines and service connections to below poverty line (BPL) consumers. During survey the village infrastructure was inspected visually as per the line diagram, DPR available at the circle office and REC. It was found that village distribution infrastructure has been created as per the DPR and as per the approved line diagram. The quality of the infrastructure is good. All the transformers, HT and LT poles installed were found to be in good condition. There was wooden poles use in old projects that needs to be replaced. As reported there are no high voltage distribution system (HVDS) based network designs in the rural areas of the state. Voltage drop is evident in the remote households in the villages. The current networks provide connection to most of the APL consumers also. The rural network design can be reviewed keeping HVDS scheme in mind, as rural load is expected to grow and the consumers will demand quality power.

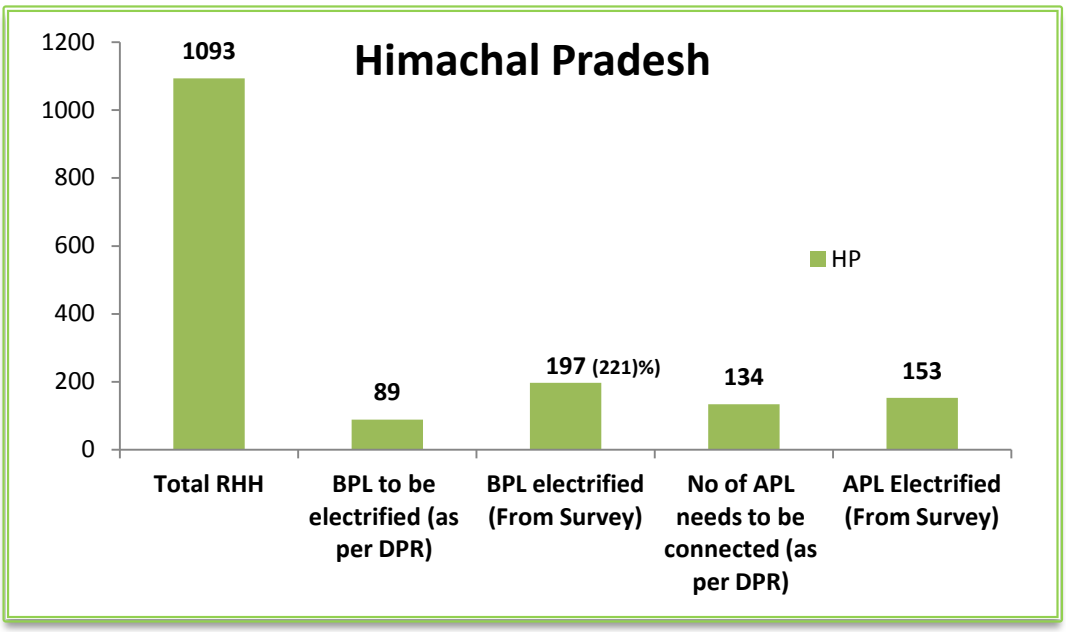


Figure 1: Connections released after RGGVY infrastructure commissioning

The state has separate BPL list and is available in the net. The three district of the state had been electrified, long back (1988) and had procedure to release connections. Considering five districts 221% of connections were released over DPR value. 153 APL connections were released with the newly facilities available. The state may consider separate feeder for electricity distribution to agriculture consumers, as has been done in Gujarat. The state is in

the process of enhancing its irrigation potential from current 18%. Proper choice of irrigation pumps as recommended by BEE may facilitate in energy conservation in agriculture sector.

2. Study the actual implementation schedule till the last milestone

Projects related to RGGVY programme implementation in the higher reaches region (Pangi Valley, Lahaul Spiti) are getting delayed due to bad weather and closure of access road. HPSEB has used experience of Chamba for management of Spiti project. The RGGVY programme implementation in Chamba district was planned in 10th Plan; but its completion date has been shifted to March, 2012. Pangi is a land locked area and for providing reliable Grid connectivity about 64 Km long 33kV line, including about 6 Km underground cable passing over 14200 feet high altitude is being constructed. The work of construction of 33/11 kV substation and distribution system in the valley will be tested soon. The work in Pangi Valley and Spiti are delayed due to Heavy snow and bad weather. The wok of providing connection to BPL families living in villages in the Mandi, Bilaspur circle, Hamirpur, Una district is nearing completion. The state government also provides connection to BPL families. There is ambiguity on the agency that is providing the connection as the connections are provided by both under funding of state government and RGGVY programme.

District	Average implementation time for Village connection	Delay
Chamba (10th Plan)	70	46
Mandi (11th Plan)	35	11
Una (11th Plan)	46	22
Hamirpur (11th Plan)	35	11

In Una, Mandi and Hamirpur delays in implementation has been reported. The reasons attributed are (a) inspection clearances of the materials used and prior to system testing (b) public dealing and forest clearances (c) Approved BPL list availability (d) flexibility in scope of work and contract. However it may be noted that the SEB supervisory wing were handling turnkey contract for the first time, and there were ambiguity on content of DPR. There is slackness in professional management due to frequent change of responsibility on RGGVY, hence site inspection gets neglected.

3. Electricity supply per day in the village/ habitation electrified under RGGVY

During the survey the HPSEB executives and few consumers claimed that the rural area gets power for 24 hours. However during survey various responses were received; such as (a) tripping of line from the transformer (b) during winter there is significant shortage power (c) significant voltage drop in the houses connected with long LT line; were observed and heard. The survey team opined that the electricity available per day can be taken as 18 to 24 hours. In HP manpower is available for the maintenance failure on 24 hour basis.

4. Number of APL connections released in the RGGVY village

In the electrified villages above poverty line (APL) population has taken up connection as per HPSEB procedure. APL consumers can take-up connection on submitting application. Cost of APL connection is Rs. 3000/-, excluding meter. The APL connection released are indicated in figure 1; that is 114% of the planned number was released.Meter cost is recovered on a rent basis. It was informed that BPL connection costs the HPSEB between Rs 4000 and 4800/-; depending upon location. REC provides Rs 2200/-, and rest is borne by the state.

5. Issue of electricity bill to new connections. Examine instances of disconnection.

The efficiency and billing and revenue collection is more than 95%. In the newly electrified villages consumer indexing is in progress, during . The two villages in Chamba are not electrified. In the surveyed villages, the incidence of disconnection was not witnessed. The DISCOMs claimed that there is 0.5% incidence of disconnection as per routine task. They have to take into account migratory population in the tribal areas of Spiti.

6. To examine the efficacy of working of franchisee in distribution management

Meter reading and billing is being done by independent agency. Revenue collection is organized by HPSEB office. In future a Franchisee system will be established. The franchisee will be assigned the task of billing and revenue collections. HPSEB has tendered for requisitioning application from interested party (on an individual basis, and how they structure is up-to them). The average indicated initial cost in tender is around Rs. 33.00 per

household. The tender specifies minimum qualification of matriculation with 2 years experience of working in electricity system. The qualification may be relaxed in case of remote villages but their competencies will be ensured. Franchisee scope of work will include all connection below 20 KW load. Franchisee Model of type Meter Reading & Bill distribution procedure has been finalized and implementation is under progress.

The Deployment of Franchisee in H.P. is under process in the Rural areas covered under RGGVY, has been strategized and accordingly the "National Franchisee training program" conducted by REC, Hyderabad shall be conducted.

7. **Socio-economic impact of village electrification under the scheme in respect of standard of living, education, health, employment opportunities etc**

The rural population is more proactive to take benefit of electricity, while they also claim they have to save electricity consumption due to high cost. On being told that electricity supply is subsidized, they were not convinced. The schools have been provided with electricity most of them before RGGVY scheme, but they do not have teachers. Hence a holistic development is needed to take benefit of electrification. Villagers claimed that infant mortality has come down in the region as availability of electricity has improved health-centers and doctors also visit the area. Agriculture and horticulture contributes to 45% of GDP for the state. The state has 18% of irrigated area. Increase in irrigated area will provide further prosperity of the region. Himachal is known for cottage industry, but in most of the surveyed villages these were not found.

8. **Extra power in the state to meet the need of newly electrified villages**

State has not followed HVDS design in the rural areas, and uses the small capacity transformer by default. Since the villages were electrified long back, their network design is based on previous concept. They have been using small capacity hence they desire augmentation of DT to 63 KVA. The state had been enhancing consumer base systematically and continuously, hence sharp increase in demand is not expected. In spiti they receive power from mini hydro projects during summer. Primary concern is power deficit during winter, which impacts the rural area more. Cost of power purchase by HPSEB during winter is high.

There is need for development of commercial activity as envisaged in HP Development report, for which HPSEB can provide separate connection. The power consumption in agriculture sector and commercial sector is increasing rapidly. Growth in consumption in rural domestic sector is comparatively low. Hence apart from managing growing demand of electricity the HPSEB has to plan for appropriate network design for supply of power to agricultural, commercial consumers and mini hydro projects.

Himachal Pradesh has good record of implementing development plan. The existing backward linkage provisions undertaken under RGGVY have been able to sustain increase in domestic connection, but will be unable to cater to industrial and commercial load. There are reports that some industries from neighboring states are shifting to Himachal. Hence HPSEB has to plan for additional load from rural areas, and infrastructure to sustain the demand.

9. States have formulated and adopted the Rural Electrification Policy

The state SEB has prepared Rural Electrification Plan (REP) and that has been notified and communicated to the MOP. The Rural electrification plan is for 11th plan. The state has to rework the REP in the context of census 2011, experience gained in last seven years, approved hydro-power projects, Himachal Pradesh Development plan. Some of the observations on the REP of the HPSEB are

- The emphasis should be on design and power planning for DDG sources
- There is a need to augment the capacity of sub-transmission line. The Operation and Maintenance of RGGVY Infrastructure is going to be huge Challenge in Future. Human resource development is very important. For enhancing the motivation level of man-power TQM methods should be incorporated with Capacity building exercise.
- Network design, HVDS system, and separate feeder for Agriculture and SMEs.

10. To study the RGGVY DPRs and assess whether DPRs have been developed taking in account various aspects

From the DPR available to the survey team it appears that there is inconsistency in DPR making. In the prosperous districts the quality of DPR is very good covering all parameters suggested by REC while the DPR for high reaches mountainous region it is comprehensive. DPR of Lahaul and Spiti mentions about APDRP and PMGY scheme, it is not clear how the work is planned. Implementation schedule for these areas for Village Electrification Infrastructure (VEI) may be extended for (a) available working month (b) deployment of manpower. The electrification in villages having households less than 10 may be reconsidered. Himachal Pradesh has good resources for renewable energy. REC can encourage supplementary DPR in some villages in Mandi distribution circle where DDG system can be integrated with the infrastructure developed under RGGVY Programme. Some of the reasons for implementation delays may be looked into and corrective can be incorporated.

11. DDG scheme in its present form[1]

The Himachal Pradesh government has issued policy document "Generation – Small Hydro and other Renewable Sources of Energy". The document has special emphasis on small hydro-projects. The state has 9 rivers of which four are major rivers. Some of the important reservoirs and Dam in the region are (a) Baira Siul on Ravi River near Chamba (b) Bhakra Nangal Dam on Satluj River near the border between Punjab and Himachal Pradesh (c) Chamera Dam on Ravi River in the Chamba district of Himachal Pradesh (d) Nathpa Dam on Sutlej River in the Kinnaur and Shimla districts of Himachal Pradesh (e) Maharana Partap Sagar also known as Pong Dam on Beas River in the Kangra district of Himachal Pradesh (f) Pandoh Dam on Beas River in the Mandi district of Himachal Pradesh.

The State Government has been proactive and there are approximately 2221 solar systems functioning in the state. The challenge is to develop hybrid system linking wind power with other form of renewable energy and state grid. As the smart grid technology is evolving, in twelfth plan state renewable energy system will have capacity to be linked main state grid. State can plan power pooling at the block or district or circle or sub-division level. This may indicate demand that can be met by DDG Scheme.

The state government provides subsidy for BPL and consumers in the rural Areas. For the year 2011 they had allocated 166 crores for the subsidy. With respect to consumers under

[1] http://www.ireda.gov.in/Compendium/index%20copy.htm

Water and Irrigation Pumping Supply (WIPS) category, the energy charges fixed at Rs. 0.50 per kWh to the consumer category up to 20KW under single part tariff and Rs. 0.50 per kVAh only for LT category under two part tariff. These revised energy charges on the account of Government subsidy would only be applicable to agricultural and allied activities, and which are paid for by individuals/ user groups.

12. Suggest methods for better and effective implementation

The main challenges of implementation are in the hilly terrain in the region. For this special logistic support is needed for maintenance, erection and commissioning, operation. The site engineers are facing problem due to shortage and non availability of spares and tools and tackles for maintenance work. Maintenance worker require Rain coat and gum boot during rain and snowfall time.

The HPSEB is the executing the turnkey project only for RGGVY programme related projects. They lack experience of handling turnkey projects and that starts from the drafting of tender documents. Issue of monitoring project progress needs to streamlined, so that various clearance and inspectiong, and testing doesnot get delayed. PIAs are depending on local engineers for identifying sub-contractors. Interaction between site engineers and PIA is also an issue during testing of erected infrastructure. It could not be verified that state projects are being done in schedule. Electricity Distribution Circles (EDC) in HPSEB, can execute future rural electrification projects as work contract, EDC be made Cost and Profit Centres, and be sanctioned RGGVY funds. This may facilitate effective project implementation, fund utilization, and monitor parking of fund and ensure efficient Distribution Management in rural areas in combination with urban areas

For financial viability commercial potential in the rural areas may be encouraged.

Lessons from Himachal Pradesh

Despite all above facts, clubbed with hostile weather conditions in the state, the H.P. State Electricity Board has been able to keep the rate of distribution transformer failures at much

lower level as compared to many other states in the country, by adopting and ensuring the following measures :-

- No compromise to be made with the quality of the DTR's during the complete process of procurement.
- Proper installation of the DTR-substations, with special reference to proper Earthing system layout.
- Lightning Arrestors has to be connected to separate independent effective earth.
- Transformer neutral to have two separate earths connected to it.
- Balanced loading upon all the three phases of the transformer by ensuring properly designed and laid out LD system network. This is taken care during downstream design of LT line
- No overloading to be allowed upon the distribution transformer replacement (DTR). They monitor the load requirement of villages, and block and take pre-emptive measure to change the transformer, if the load on the transformer increases and reaches design capacity.
- Adding new DTR's or augmenting the substation capacity as and when required.
- Regularly monitoring and updating the transformer earths and transformer oil for its dielectric strength.
- Periodically dehydrating the substation transformer as and when required.
- Regularly monitoring the phase-wise loading of the transformer, especially during the peak loading hours and balancing it accordingly.
- Other utilities may also follow above tips to achieve similar results.

The state has been able to reduce AT & C losses from 48.46% in 2002-03 to 24.12 in 2010-11. This has been feasible mainly by adopting and ensuring the following measures regularly and meticulously:-

I. 100% metering of all the consumers in state.
II. 100% billing & collection for all the consumers.
III. Regularly and vigilantly monitoring and checking the power thefts and strictly and sternly dealing with the consumers indulging in power theft.
IV. Promptly replacing the dead-stop and defective energy meters.

V. Regularly monitoring the consumer ledger-accounts with regard to doubtful or nil consumption cases so as to suitably and regularly rectify the same as and when they occur.

VI. Regularly educating and updating the staff, along-with officers too, with regard to monitoring the T & D losses so as to keep them pegged low.

VII. Proper technical-designing of the power system, especially the distribution system and regularly continuously augmenting and reorganizing the power system network, with special stress upon the

VIII. Distribution Network; so that the technical losses are able to be pegged at low level.

Some of the recommendations and policy options suggested by senior stakeholders are:

(A) Policy Matters

(i) In small hilly and mountainous states like Himachal Pradesh, most of the un-electrified populating households including the BPL families reside in small scattered pockets, particularly in remote hilly/mountainous areas, having a population of less than/far less than 100.Therefore this Population- Norm needs to be revised downwards to cover either for all un-electrified houses, irrespective of the pocket-population or, at least, to cover a population of more than 25.

(ii) The transformers to be provided should be of, at least, 63KVA capacity.

(iii)The cost provision for a BPL family connection may be raised from Rs.2200/- to Rs.3000/-per connection.

(iv)For reduction of line-losses in the system, High Voltage Distribution System (HVDS) needs to be incorporated in the RGGVY Programme, where the number of household is more. separate feeder for agriculture and cottage industry may be considered

(v) Norms of DPR are made, a bit, more flexible for executing the RGGVY works for those states that show (a) better quality of work, (b) financial discipline (c) targeted time bound achievements (d) hostile terrain such as in Chamba and Lahaul & Spiti.

(vi)Provision for Replacement of the existing old and rotten wooden poles with P.C.C./steel tubular poles is made.

(B) Technical Matters

For better power supply quality, the following need to be incorporated in future in the RGGVY Schemes:-

(i) Provisions for supply system reorganization are made for rural electrification.

(ii) Underground cabling may be considered in the areas, effected by storms.

(iii) Project management for the hostile terrain can be reviewed, by making resources ready in geographically friendly region, and accelerating site activity during better weather condition.

(iv) Supply system strengthening be allowed by:-

a. augmenting the existing L.D. System and link it with R-APDRP programme,
b. Augmenting the existing sub-station transformer capacity.
c. Integrating the adjoining L.D. Systems suitably, with protective system
d. Providing one Tapping Structure along with one G.O. control Switch in each H.T. Spur line for each new transformer.

General Observations

For addressing implementation issues the points need to be considered are (a) Clarity in Scope of Works defined in the DPR may be with some flexibility, (b) clarity in the specification, (c) Contracting procedure may be reviewed (d) Coordination between REC, HPSEB and (e) effective Collaboration between Project Implementing Agency (PIA) and the HPSEB; so as to resolve ground level problems with speed and clarity.

Chapter 1
Background of the RGGVY Evaluation Study

Himachal Pradesh landscape has high altitude ranging from 350 to 6975 meters with climate conditions varying from semi-tropical to semi-arctic. The total population of Himachal Pradesh as per 2011 census was 6,856,509 with population density being 103 persons per sq. Km. However, there are wide variations in geographical features and population density figures of the districts; and district-wise population density varies from 2 persons per sq. km. in Lahaul and Spiti, to 330 persons per sq. km in other areas."[2]

Himachal Pradesh is a hilly state with about 50% area in mountainous region with high altitudes, snow clad for about 3 to 8 months in the years. Four of the prime tributary of Indus River originate in the state or pass through the state. These water of the rivers have been harnessed for generating hydropower, and share of that has been channelized to consumers in rural areas of Himachal Pradesh. Many of the habitations are remote and scarcely populated. But despite that, Himachal Pradesh has achieved a rare distinction of being amongst the very few states in the country to achieve approximately 100% village electrification, as early as during the year 1988. This was achieved despite extremely hostile topographic, geological and weather conditions prevalent in most part of the region. The benefit of electrification did not reach (a) the BPL population and (b) remote villages located in difficult terrains. The government saw RGGVY programme as an opportunity to strengthen the rural electricity network to boost rural economy and creating more economic activities and generating social livelihoods.

Unlike other states the administration and management of state electricity network is managed by Himachal Pradesh State Electricity Board (HPSEB). The implementation of RGGVY programme is executed by HPSEB. The HPSEB has designated a director to manage the implementation of RGGVY programme.

[2] http://www.hpseb.com; Accessed February 2012

Chapter 2:

Rural and Remote Village Electrification Programme under RGGVY Programme in Himachal Pradesh: Study

The objective of evaluation study was to monitor the tasks performed by HPSEB and RGGVY project implementing agency in the context of Terms of Reference (TOR) issued by REC. The study is based on the observation of rural electrification in the districts of Mandi, Lahaul and Spiti, Chamba, Una and Hamirpur. The details of assigned villages of the study in the following district-block-villages as indicated in Table 1.

Table 1: Villages in Himachal Pradesh to be surveyed for the project

Name of the District	Name of the Block	Name of the Village (Census Code)
3 MANDI	Karsog	1 GALIOG(86) (00884700)
	Mandi Sadar	2 D.P.F. KHOTI (455) (00762500)
	Rewalsar	3 GHARBASRA (165) (00776400)
	Seraj	4 DPF CHHATRI (416) (00843500)
		5 PATAK (421) (00840600)
2 LAHUL & SPITI	Spiti	1 DUPHUK (177/2) (00596800)
		2 LAPCHA (174/2) (00596400)
		3 MULCHE (155/3) (00593200)
		4 PINJOOR (61/2) (00581500)
		5 TARBOLE (151/3) (00592500)
4 UNA	Amb	1 BATUHI(439) (01184200)
	Dhundla	2 CHAKROA (6/13) (01163300)
		3 GHARTHOLI (01161600)
	Una	4 CHAUKHYAL (01191900)
		5 RAISARI UPPERLI(192) (01188100)
5 Hamirpur	Bijhar	1 Gangot Khurad (1061800)
	Bhoranj	2 Khurral-II (1113000)
	Nadaun	3 Pukhrani (984100)
		4 Sasan Brahmna (987500)
	Sujanpur	5 Broha (1040300)
1 CHAMBA	Pangi	1 HUNDAN BHATORI (18) (00001300)
		2 MICHAM (53) (00005700)

		3 MOJHI (73) (00009500)
		4 SAICHU (65) (00009800)
		5 SURAL BHATORI (16) (00001100)
Districts: 5	**Blocks: 25**	**Villages: 25**

Despite the claim of 100% electrification in rural areas, the state did have un-electrified villages. The profile of electricity consumers in the state was obtained from HPSEB and that is indicated in table 2. What is worth noting is that the state has developed beyond rural electrification definition and has prepared good consumer based. The development of the state is visible from the fact that there is significant growth in consumption in agriculture and other (Services) sectors, despite the irrigation is available in 18% agricultural land.

Table 2: Consumer Profile

Sl. No.	**Consumer Category**	**Total No. of Consumers in State**			**Consumers disconnected in FY 2010-11**	**Main Reasons of Disconnection**
		end March 2009	**end March 2010**	**end March 2011**		
1	APL + BPL + SC/ST Connections	1591315	1625175	1670476	Approx. 0.5 %	Routine process
	Growth % in Sl. No 1		2	3		
2	Agriculture	13732	15123	16811	Approx. 0.5 %	Routine process
	Growth% in Sl. No 2		10	11		
3	Industry	33400	34152	34171	Approx. 0.5 %	Routine process
	Growth% in Sl. No 3		2	0		
4	Commercial	212102	216595	222936	Approx. 0.5 %	Routine process
	Growth% in Sl. No 4		2	3		
5	Others	23765	25735	27168	Approx. 0.5 %	Routine process

	Growth % in Sl. No 5		8	6		

As per the REC guidelines the RGGVY programme is planned for each district by the state electricity board and is to be implemented by Turnkey Contractors. Turnkey contractors are the project implementation agency. The DPR for projects of RGGVY programme is prepared by Project Implementation Agency (PIA) with the inputs from State Electricity Board. Project implementation agency is selected from the open tender procedure as guided by REC and tendered by HPSEB. The some of the turnkey contractors are

M/S Vindhya Telelinks, New Delhi (2 blocks of Lahaul valley)

M/S Hythro Power Corporation, Gurgaon, Haryana (Spiti block)

M/S Himachal Energy, New Delhi (Five blocks of Chamba District)

M/S Eri Tech, Calcutta (33KV line in Pangi block)

One local firm of Chamba District (One block of Chamba District)

Electrification of the rural areas in the Himachal Pradesh was being pursued since long. Hence the task was of developing and augmenting electricity infrastructure in the already electrified network, except of regions having hostile terrain and area having very low population density such as Lahaul Spiti, Chamba. The RGGVY programme is initiated in 10^{th} five year plan, and continuing in 11^{th} five year plan. The RGGVY programme in Chamba District was sanctioned in 10^{th} five year plan, rest were approved in 11^{th} five year plan. The work in Chamba district and Spiti Block is still continuing, and may spill over to 12^{th} plan. The approved DPRs (processed by REC) are tendered. The tendering process is generally executed from office of Director (RGGVY, HPSEB) or Chief Engineers. The response to the tender of electrification of remote villages is low and is sometimes nil. The office of CE sometimes requests and delegates the power of tendering to site engineers in order to ask local agency to take up the job. If there is lack of coordination between contractor and project awarding agency, it may lead to delay in the project. This some-time creates problem during handing over and taking over procedures. There are areas which are covered with snow for 3 to 6 months. There the progress of electrification is very slow e.g. Pangi Vally of Chamba (10^{th} plan project) and Spiti block in Lahaul and spiti; where work is still in progress. Table 3 is the data obtained from REC New Delhi indicating progress made by HPSEB in the state

Table 3: Project wise achievement of electrification of villages & Households under 10th and 11 th plan in Himachal Pradesh (PIA is HPSEB)

Project wise achievement of electrification of villages & Households under 10th and 11 th plan in Himachal Pradesh (PIA is HPSEB)

			Achievement (ach) 2011-12		Cumulative achievement till 30-11-2011							
sl no	District in the state	Plan	UE/DE Villages	BPL HH	UE/DE Villages	EV	RHH including BPL	BPL HH	No of SC/ST BPL HH	Energization of UE & DE villages	% ach of UE Villages wrt Rev Cov	% ach of BPL HH wrt BPL HH
1	Chamba	10	2	48	11	1059	743	743	222	10	73	103
2	Hamirpur	11		223			452	452				147
3	Mandi	11	2	856	11		1248	1248		10	92	81
4	Spiti	11	3	25	8		25	25		6	28	13
5	Una	11		609			1265	1265				120

Chapter 3

Approach and Methodology to Evaluate the Programme

The REC office for the state operates from Punchkula, and they have office at Shimla. The Office of CPM, REC Panchkula provided the initial information of RGGVY programme to plan the study methodologies. The contact with HPSEB was established with the assistance of REC office in Shimla. The Punchkula office provide the contact and soft-copy of Lahaul and Spiti DPR. The Shimla REC office helped in contacting RGGVY department of HP_SEB. They in turn helped in establishing contact with Chief Engineer Mandi circle, and informed other circles about the project. The discussion at RGGVY office, HPSEB was focussed on the procedure followed in RGGVY programme execution. The sequential procedure followed is as follows:

- Preparation of district based detailed project reports for execution on turnkey basis.
- Call for tenders for the rural electrification in the district on a turn-key basis from competent contractor.
- Provide enabling services to turn-key contractor to implement project according to schedule
- Adhere to the protocol of handing over of asset by contractor and taking over of Asset by HPSEB and turnkey contractor.
- Certification of electrified villages by the concerned Gram Panchayat.
- Deployment of franchisees for better management of rural distribution, for better consumer services and reduction in losses.
- Making provision of requisite revenue subsidy by the state.
- Three tier quality monitoring mechanism for XI Plan Schemes have been made mandatory.
- Web based monitoring of progress.
- Release of funds linked to achievement of pre-determined milestones.
- Notification of Rural Electrification Plans by the state governments as per guidelines of Electricity Act 2003.

IRADe followed the standard procedure for the study

a. Analyzed the TOR to strategize project execution, and based on the same it prepared Inception report, and the got it vetted by REC. The document has been the part of the focussed discussion with the stakeholders
b. Formed the survey team to (i) interact with state-level stakeholder (ii) contact the HPSEB executives for their perception (iii) compilation of parameters of rural electrification work
c. Literature survey of the state level documents and the documents of quality monitoring agencies.
d. Interact with the consumers through field surveys.
e. Survey data analysis and report preparation.

The IRADe Team conducted intesvive stakholders consulation with vilagers and the interacted with the senior and junior officals of the HPSEB. Photo below shows IRADe team is interacting with the Senior officilas of HPSEB , Mandi circle.

It has been observed that electrification infrastructure has been created for villages having population less than 100 also. APL population has taken up connection as SEB procedure. Cost of APL connection is Rs. 3000/- excluding meter. Meter cost is recovered on a rent basis. It has been noticed that HPSEB has provided improved quality connection to the BPL consumers. REC sanction provides for Rs. 2200 for each BPL household connection. The BPL connection cost varies between Rs. 4000 to 4800. Additional cost of connection is borne by HPSEB. In HP manpower is available for the maintenance failure on 24 hour basis; However villagers provided a separate picture.

As per the Quality Control Manual governing RGGVY XI Plan scheme, a three tier control mechanism has been made manadatory for implementation of scheme. In Tier II, when the

progress crosses the 35% mark, stage I inspection call can be issued to the respective RQMs of the state. In Himachal Pradesh, M/s Voyants Solution Pvt Ltd has been appointed as REC Quality Control Monitors.

Information of Fund sanctioned was obtained from the REC, Panchkula office, this is indicated in Table 4. Sanctioned fund is high for Chamba, and comparatively low for Lahaul and Spiti. In Lahaul and spiti there is no provision for New 66/22 KV or 33/11 KVA Sub-stations. Both the areas get covered due to snow during winter. In Spiti Block they migrate to the lower altitude areas

Table 4: Funds Disbursed in RGGVY scheme to HPSEB ltd. (Value in Lakhs)

Funds Disbursed in RGGVY scheme to HPSEB ltd. (Value in Lakhs)														
Scheme	**Revised sanctioned amount. (Rs. Lakhs)**	**1st Installment (Rs Lakhs)**		**Date of release**	**2nd Installment (Rs Lakhs)**		**Date of release**	**3rd Installment (Rs Lakhs)**		**Date of release**	**Differential Amount due to revised sanctioned cost**		**Date of Realease**	**T sa**
		Grant	**Loan**		**Grant**	**Loan**		**Grant**	**Loan**		**Grant**	**Loan**		
Chamba	6634	673	75	19.03.07	673	75	03.03.09	1788	199	08.12.09	2231	248	04.06.2009	
Una	2303	615	69	03.03.09	615	69	19.02.10	502	56	31.03.11	NA	NA	NA	
Bilaspur	435	117	13	03.03.09	88	10	12.03.10	143	16	03.12.10	NA	NA	NA	
Hamirpur	597	160	18	03.03.09	160	18	25.03.10	129	15	24.03.11	NA	NA	NA	
Mandi	3366	899	101	03.03.09	899	101	12.03.10	723	82	28.03.11	NA	NA	NA	
Lahul Spiti	**1324**	**353**	**39**	**09.07.09**	**353**	**39**	**08.10.2010**				**NA**	**NA**	**NA**	
	34186	8017	898		7662	857		6247	704		2231	248		

Total Amount Released in Lakh Rupees

The RGGVY programme was to develop the REDB and VEI work for the rural areas of the state. Table 5 indicates the holostic status of the work done and the scope and quantum of work in the state to be excuted in the concerned district and state as a whole.

Table 5: RGGVY Schemes- At a glance as on 31.05.2011

RGGVY Schemes- At a glance as on 31.05.2011						
Sl. No.	District	No. of Village covered	No. of Electrified Villages covered	No. of un-electrified Village covered	No. of HH covered (incl. BPL)	BPL HH covered
1	Chamba	1118	1103	15	2531	647
2	Una	758	758	0	3837	964
3	Bilaspur	278	278	0	701	42
4	Hamirpur	274	274	0	1047	187
5	Mandi	1410	1398	12	6301	1537
6	Lahul Spiti	286	257	29	999	194
Total :		10759	10651	108	44496	12448

Table 6: Expenditure incurred Under RGGVY

EXPENDITURE INCURRED UNDER RGGVY till 31-5-2011			
Name of State : Himachal Pradesh			
Sl.	**State/District**	**Implementing Agency**	**Total expenditure incurred (Rs. Lacs)**
1	***2***	***3***	***4***
	10th Plan Projects		
1	**Chamba**	HPSEBL	3797.09
	11th Plan Projects		
2	Una	HPSEBL	1300.29
3	Bilaspur	HPSEBL	253.81
4	Hamirpur	HPSEBL	374.54
5	Mandi	HPSEBL	1681.06
6	Lahaul & Spiti	HPSEBL	595.63
	Sub Total (11th Plan)		**4205.33**
	Grand Total of All Districts		

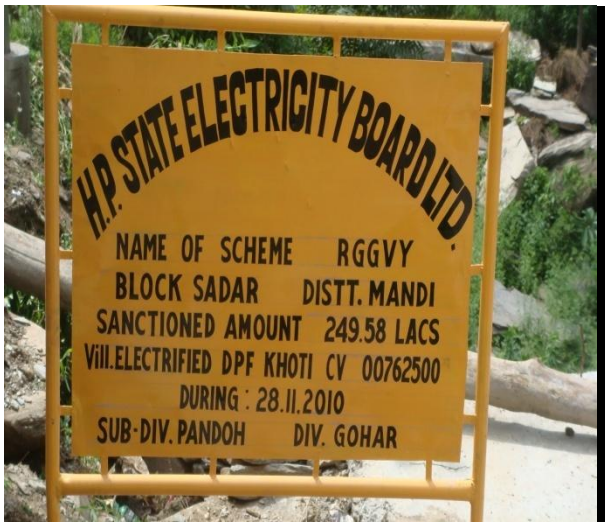
Chapter 4:

Observations of Field Survey

As mentioned in the chapter 2, the study is based on the observation of rural electrification in the districts of Mandi, Chamba, Lahaul and Spiti, Hamipur and Una. The chapter contains the information and observations compiled during the village survey. The villages assigned in Mandi were located in two separate electricity distribution circle (a) Mandi (b) Bilaspur. The villages in Mandi Circle are DPF Kothi and Garbhasara. Other villages are in Bilaspur circle.

The IRADe team observed that a DPF village in Mandi district had population of only two households. These villages were defined as Demarcated Protected Forest (DPF) area since state time (princely states before independence). Through allotment of these areas/ land as lease land; given to villagers by the state authority as grassing land. These lease lands were converted as one land during the land settlement after showing the lease land paper by lease land owner. After granting the owner-ship to people, made their house, and then the people demanded water and electricity from state government. Forest department control all activity of the area. Social activities are not all allowed without permission from forest department. HPSEB people mentioned that they did not face problem from state forest department.

We discussed the issue relating to the award of the turnkey contract, scope of work. How effectively it is being monitored by the HPSEB. Initially officials said that their scope of work is properly executed as per guidelines of REC, but then they mentioned that there are discrepancy, such as lightening arrestor is there near the distribution transformer but not erected. Small nature problems are resolved by HPSEB themselves. Photo below shows the RGGVY board is installed and connection is given to the small kirana shops in DPF KOTHI village (having two households).



Ghrabhasara, is a hilly village which was already electrified as per earlier definition. There only one BPL connection to be released and only one Rural household connection to be released. There is no augmentation of transformer capacity, as it was not a part of DPR. The survey team felt there was a need for it. The contractor Mr. Gupta, who has carried out the work in Grabhasara showed us the work. The board was installed but it seems it was installed very recently. The village census code number was not right and it was conveyed to the officials for rectification. We (our team) found the transformer was not in a very good condition and needed servicing. The cable joints are not proper and oil was leaking from the transformer. The maintenance activity of the transformer is done once in every two months. The new pole under RGGVY programme is installed properly and was to our satisfaction. The consumers accepted that there has been any improvement in quality of life after the village was electrified. They maintained it is much better but complained about erratic power supply (The SEB executives claimed 24 hour supply except for winter season). The village had four single phase flour mills and one small kirana shop has come up after the electrification. There are 144 household in the village, among them only two are not electrified, few non BPL household. One BPL connection was released just 4-5 days ago. There was no electric bulb available in BPL household, we borrowed a bulb from nearby house and checked the connection, and electricity supply was there.

BPL households told us that they are getting 24 hours of electricity despite the fact of reported tripping of network. The children could do extra studies during the evening. However we suggest that BPL household need more than one bulb.

The summary of the village survey in the **Mandi districts** and the electrical parameters of the network is indicated in the table 7.

Table 7: Electricity Network parameter in the District – Mandi; Distribution Circle - Bilaspur

District – Mandi; Distribution Circle - Bilaspur						
	Block Karsog		Block Seraj			
	Galiog(00884700)		DPF Chhatri(00843500)		Patak(00840600)	
	BPL	APL	BPL	APL	BPL	APL
BPL household electrification in the villages	10	0	1	0	1	0

Total Number of BPL & APL household in the villages	10	2	1	5	1	3
APL connection after RGGVY in the village		2		3		
Dates of Village energization and handling over of assets	23-03-2011		15-06-2011		20-11-2010	
Energy supplied in the villages	1330		320		0	
Energy billed in the villages	1330		320		0	
Collection of bills and bills outstanding in the villages	100%		100%			
Transformer capacity (KVA) for the villages	25 (at Galiog)		100KVA (at Chhatri –II)		63 KVA at Magrugalu	
average BPL and APL load in KW	0.74	1.2	0.74	1.2	0.74	1.2
T&D losses on the feeder	30%		25%		25%	
Average electricity demand growth in rural areas in your circle					8%	
Substation feeding the electricity supply	33/22KVA Pangoana X----------X 25KVA Galiog		66/22KVA KumarsainX----------100KVA,Chhatri-II X----------63KVA Magrugalu			
Single line Diagram132/33/22KVA system feeding the village						
Failure of Transformers in the Villages	NIL		NIL		NIL	
% of meter failed in the villages	NIL		NIL		NIL	

The table 7 indicates the APL and BPL load at 1.2 Kw and .74, but the survey team estimates at .15 for BPL and APL load could not be estimated. The villages in the district use electricity economically.

Survey of D.P.F. KHOTI Village:

1. As per RGGVY statistics, three household need to be electrified. We found that there are only two household, in fact it was precisely a small shop.

2. This village was formed in the year 2004.It lies in the forest area.

3. The connection was given to the shop (household), he has received 2 bills. They receive once in two months. The consumer complained about low voltage.

In fact we asked to villagers from the nearby village DEWAS and they said the voltage is very low, there by not helping much during evening hours. We inspected the transformer and the lines and it was up to our satisfaction.

The Pangi (Block) area of Chamba District (where all the sampled villages are located) and the whole area of the Distt of Lahaul & Spiti are situated in the tribal belt of Himachal Pradesh. The geographical area is covered with high altitude mountains, which are snow-clad during most part of the year. The average height of the populated area is approximately between 8000ft to 12000ft (above sea level) in the Pangi area of Chamba District and 8500ft to 14500ft in the District of Lahaul & Spiti. The weather conditions are very hostile, especially during the winter season when it snows heavily, cutting-off the accessibility to these areas. Some valuable statistical data/inputs about the ongoing/ completed works under the RGGVY Scheme have been collected from the circle office and the same are being furnished as per the two table herewith.

Table 8: Project Progress in the Chamba District in Himachal Pradesh

Description of Items	Total provision of the scheme	Progress of the completed works up to Oct.,2011	Progress during the month of Nov., 2011	cumulative progress of the completed works	Cumulative %age progress of the competed works	Remarks / Targeted completion date
10th Plan Projects (Six Blocks excluding Pangi Block)						
33 KV New S/Stn	-	-	-	-	-	The works of HT & LT Line in these six blocks have been carried out as per the actual site
33 KV HT Line	-	-	-	-	-	
Augmentation of 33 KV S/Stns	4	-	-	4		
11 KV HT Line	176	164	-	164.		

LT Line	370	351	-	351.		requirements. As such, the balance provisions of six blocks of Chamba District are not required. The electrification of the additional identified BPL HHs is in progress. The same would be completed by 2012.
DTRs	160	160	-	160		
BPL HHs Connection	436	436	-	436		
Additional BPL HHs	773	194	0	194	-	
Electrification of Un-electrified Villages	1*	-	-	-		
10th Plan Projects (only Pangi Block of Chamba District)						
33 KV New S/Stn	1	Work in progress			95.%	The works for Pangi Block are under progress. The extension of 10th Plan Projects have been granted up to March, 2012. However all the remaining works are likely to be completed by Nov., 2012
33 KV HT Line	64	16	0	16	25.%	
11KV HT Line	36	22.	0	22.91	64%	
LT Line	102	33.	0	33.43	33%	
DTRs	15	12	0	12	80%	
BPL HHs Connection	211	113	0	113	53	
Additional BPL HHs	313	0	0		0%	
Electrification of Un-electrified Villages	15	11	1	12	80	

A perusal of the **Chamba District** data in table 8 reveals that:-

All the RGGVY works in 6 blocks of Chamba District (excluding Pangi Block) are completed since October 2011, except some additional BPL House-holds connectivity; which is, however likely to be completed by the next year i.e. November 2012.

In the Pangi tribal block of Chamba District also, all the RGGVY works are approaching the completion stage which is likely to be achieved during the next working season of 2012;

except, of course, the construction of 33KV Line which is likely to take, at-least, two more working seasons of the next two years, and that too, if the present pace of work is stepped up by still more actively and relentlessly pursuing the matter with the concerned contractor firm, namely M/S **Eri Tech**, Calcutta.

(i) The RGGVY Scheme project in the Chamba District is in the 10th plan projects whose extension has been granted up-to March 2012 only, at present.

(ii) The RGGVY works have been executed by four contractor firms/Project Implementing Agencies (PIA), namely:

1. M/S Himachal Energy, New Delhi (Five blocks of Chamba District)
2. M/S Vindhya Telelinks, New Delhi (One Pangi block of Chamba District)
3. M/S Eri Tech, Calcutta (33KV line in Pangi block)
4. One local firm of Chamba District (One block of Chamba District)

The quality of electromechanical equipments/material installed/utilized on works and the workmanship of the works executed have been gathered to be varying from satisfactory to good and even very good, in some cases. The pace of job execution has also been gathered to be varying from reasonably good to even very good (by M/S Vindhya Telelinks in Pangi block despite limited working season and extremely harsh terrain). Although, the pace of work in six blocks of Chamba District was initially very slow, mainly due to many teething problems, (since this was the first Turn-Key Project of this magnitude and kind in H.P.), yet it did pick up reasonably well during the latter part of the project.

The villages Hundan Bhatori and Sural Bhatori have not been electrified. The information of other villages in the Pangi block is summarized in Table 9.

Table 9: Village information of Block Pangi District Chamba

S.No	Description	HUNDAN BHATORI (18) (00001300)	MICHAM (53) (00005700)	MOJHI (73) (00009500)	SAICHU (65) (00009800)	SURAL BHATORI (16) (00001100)
1	BPL Household electrified in the Villages	Nil	5	7	32	Nil

2	Total Number of BPL & APL					
	(1)BPL-	45	5	7	32	30
	(2)APL-	35	12	9	24	23
3	APL connection after RGGVY in the village	Nil	2	4	9	Nil
4	Dates of Village energization and handling over of assets	Not electrified	11th Sep-2011	6th November 2011	11th Sep -2011	Not electrified
5	Energy supplied in the villages	Nil				Nil
6	Energy billed in the villages	Nil				Nil
7	Collection of bills and bills outstanding in the villages	Nil				Nil
8	Transformer capacity for the villages and average BPL and APL load	25KVA	25KVA	16KVA	25KVA	25KVA
	(1)BPL	Nil	.500Kw	.700Kw	3.200Kw	Nil
	(2)APL	Nil	1.5Kw	2.6Kw	6.300Kw	Nil
9	Transmission and Distribution losses on the feeders feeding the above villages(Feeder level data)	12%	13%	13%	14%	16%
10	Average electricity demand growth in rural areas in your circle	Nil	Nil	Nil	Nil	Nil
11	Substation feeding the electricity supply	Killar(P/H)	Sach Gharat(P/	Sach Gharat(	Sach Gharat(P	Sural(P/H)

			H)	P/H)	/H)	
12	Failure of Transformers in the Villages	Nil	Nil	Nil	Nil	Nil
13	% of meter failed in the villages	0%	0%	0%	0%	0%

Lahaul and Spiti:

Physical progress of RGGVY Scheme of district Lahaul & Spiti up to Nov., 2011, is indicated in Table 10. In the Spiti Block all the five villages (1) Duphuk (177/2) (00596800), (2) Lapcha (174/2) (00596400), (3) Mulche (155/3) (00593200), (4) Pinjoor (61/2) (00581500), (5) Tarbole (151/3) (00592500) have been recently (Nov 2011) electrified. The weather conditions in the block are very hostile, especially during the winter season when it snows heavily, cutting-off the accessibility to these areas. The field survey of the sampled villages located in these areas is not possible during the winter season. This year snowfall started in Sep 2011. The population of the area migrates at the on-set of the winter and move-out to other parts of the state or to other states.

The RGGVY programme related statistics for the district are (a) Project Code 100670 (b) Sanctioned amount excluding Service / Overhead / REC & Franchise Dev Charges 1214.27 Lacs (c) Total Award Amount 1223.87 Lacs (d) Amount Released by M/s REC 785.80 Lacs (e) Total Expenditure 677.36 Lacs (f) Balance (Sanctioned-Exp.) 536.91 Lacs (g) Balance (Award-Exp.) 546.51 Lacs

Table 10: Physical progress of RGGVY Scheme of district Lahaul & Spiti up to Nov., 2011

				Physical achievement		
Description	Unit	Scheme provisions	Award Provisions	Progress Ending Previous Month	Progress During Nov, 2011	Total Progress Ending Nov, 2011
25 KVA, 11/0.4 KV Sub-Station	Nos.	7	7	0	0	0
10 KVA, 11/0.4 KV Sub-Station	Nos.	5	5	2	2	4

25 KVA, 22/0.4 KV Sub-Station	Nos.	2	2	11	0	11
16 KVA, 22/0.4 KV Sub-Station	Nos.	14	14	0	0	0
11 KV lines with ACSR-6/1/2.11 on steel poles	Km.	5.65	5.65	0.35	0	0.35
11 KV Single phase line with ACSR 6/1/2.11 mm on steel poles.	Km.	4	4	1.33	0	1.33
22 KV Lines with ACSR-6/1/3.35mm on steel Poles	Km.	52.5	52.5	20.5	0	20.5
3-Phase 5 Wire with ACSR 6/1/2.11 on Steel Poles	Km.	21.55	21.55	5.51	0	5.51
1-Phase 2 Wire with ACSR 6/1/2.11 on steel poles	Km.	51.19	51.19	20.196	2.73	22.926
1-Phase 2 Wire with ACSR 6/1/2.59 on Steel Poles	Km.	70	70	45.727	0	45.727
BPL Connections	Nos.	194	194	25	0	25
Electrification of RHH (Excluding BPL Connections)	Nos.	805	0	0	0	0
Electrification of un-electrified villages	Nos.	29	29	8	10	18
Metering of sub-station Transformers	Nos.	16	16	11	0	11

a. The overall achievement of RGGVY works is about 55% till Nov, 2011. The state utility claims that it would complete the work during the next working season of 2012 whereas the present extension granted is up to Mar, 2012. However, the ground realities have been gathered to point out that while the works in the Spiti block are most likely to be completed during the next working season of 2012, the works in the two Lahaul & Udaipur blocks of Lahaul valley may spill over to the year 2013 too.

b. There are two contractor firms/project implementing agencies (PIA) namely:

   1. M/S Vindhya Telelinks, New Delhi (2 blocks of Lahaul valley)
   2. M/S Hythro Power Corporation, Gurgaon, Haryana (Spiti block)

The quality of electromechanical equipments/material installed/utilized on works and the workmanship of the works executed has been gathered to be quite good in all the blocks. Regarding the pace of work, while it is reasonably good in the Lahaul valley, the same is quite fast in Spiti valley; although the working season is quite limited in Spiti valley and still more constrained in Lahaul valley because of the inaccessibility of the areas during the winter snow season. Moreover, the terrain is extremely remote and difficult in both the areas.

Some Other Facts

Some other important facts which could be gathered regarding RGGVY Project implementation in the two districts (Chamba and Lahaul & Spiti) is summarized as below:-

- Initially, due to some inherent teething problems in the execution of the first Turn-Key Project of Himachal Pradesh (in Chamba District), there was a lack of proper co-ordination between the PIA and HPSEB/State (being a totally maiden experience of the sort in the HPSEB) which resulted into delay in commissioning of the completed electrical works (e.g. sub-station transformer, HT Lines and LT Lines). However, with passage of time, a much better mechanism was gathered to have been worked out to have proper and regular co-ordination between the PIA and the HPSEB/State. This practically minimized such delays in the latter part of the project in Chamba District and in the Lahaul & Spiti District also.
- Due to the existing continuous power deficit management in the state by the utility (i.e. HPSEB Ltd.), there has been and shall be no problem in arranging additional power supply to the additional villages/hamlets/households brought under electrification cover through the RGGVY schemes.

  The HPSEB Ltd. has been able to provide 20 to 24 hours supply throughout the state barring, of course, some occasional power failure due to unavoidable break-downs (mainly due to hostile weather, terrain and geological conditions in the state)/arranged shut-downs/grid failures etc.

- The land acquisition process was vigorously pursued by the state utility with the quarters concerned to ensure that there was no delay in 33KV Sub-station execution under the RGGVY Project.

The REDB of the villages have been done in the conventional approach. They have not used HVDC design. The LT connection is provided from distribution transformer, which is installed at village periphery or at an appropriate location of the village. The length of LT connection is very high in some cases; hence the power loss for the consumer connection is also very high. HPSEB has adopted HVDS systems in 14 urban locations. HPSEB has reported very low transmission and distribution losses, and AT & C losses in comparison to other states. Considering the terrain and household distribution pattern; HVDS system can be designed and engineered for rural area electrification in Himachal Pradesh. There is need for optimization of hardware allocation and routing of HT and LT lines. Design template for Chamba, Lahul and Spiti, and Kinnaur districts will be different from the rest of the state. In these districts un-natural events also have to be considered for climate proofing the infrastructure. In the remote villages they find difficulties for identifying turnkey contractor through tendering process. The impression was given that they sometimes delegate the responsibility of local tendering to site engineers. In the villages surveyed, there were few irrigation pumps. They are drawing power from same network.

- Industrial connection is provided from the same network, based on need of the units. If their demand is more than 20 KW then they install a 25 KW transformer costing ~Rs. 40000. In most of the cases the connection amount including transformer is paid by the industrial consumer.
- The general impression given by HPSEB site executives was that the Cost of the project should be decided in a much more realistic manner. Current cost norms cannot be applied uniformly to all the districts of the states. There should be in built flexibility about the costing norms in RGGVY program according to terrains.
- The rural electrification had been initiated long time back. The existing infrastructure supporting the rural area supply will be inadequate as more consumers are linked to the network. For the real sustenance of RGGVY infrastructure the back ward transmission and distribution infrastructure (132/33/11 KV) has to be augmented systematically.

The quality of information available in the DPR for the different district varied significantly. Though no proper answer was available, but it appears that the capacity of sub-contractors of turnkey contractors making DPR based on the inputs from the HPSEB

varied significantly. As quality sub-contractors are not available for remote location electrification, local junior engineer was also being authorized for the task.

The Spiti valley is provided supply from the 66/22 KVA substation from Kotla and Nathpa. The distribution is coordinated at Kaza. The DT used for village electrification is 22/.4 KVA specification. Spiti Valle has two power generating station at Rongton and Ringte. During summer they provide the power to the region. During winter population tend to migrate.

The inspection report of REC and quality monitoring agencies indicated defects in project executions such as many improper earthling, lightening arrestors, fuses, improper painting of the transformer housing, coating and others. On visible inspection of the site the quality of construction appeared to be satisfactory except for (a) distance of LT line for providing connection to consumers (b) wooden poles that needs to be replaced.

The Status of Rural Electrification in the **Hamirpur district** was discussed with HPSEB executives. Preliminary information of the district is given in Table 11 below.

Table 11: Status of rural electrification in the Hamirpur district up to Nov. 2011

Sl. No.	**Village Parameter**	**Total No. of Villages**		**Total No. of House Holds**		**House Holds Connected**	
		Total Nos.	**Covered in RGGVY Nos.**	**BPL Nos.**	**APL Nos.**	**BPL Nos.**	**APL Nos.**
1	Grid Connected Villages	1635	107 partly since already electrified	18500 approx-	142000 approx-	18267	139737
2	Villages to be Connected to Grid	Nil Since all connected	-do-	NA	NA	NA	NA
3	Villages considered remote require DDG	NIL	NIL	NA	NA	NA	NA

Hamirpur district has its own Distribution Circles headed by Superintending Engineer. His task is delegated in three divisions and facilitated by three executive engineers, 19 assistant

engineers, and 91 junior engineers. The number of Meter Readers working in the Distribution Circles is 94.

The national grid connectivity of the District/Blocks/Villages are linked to the EHV Substation to feed the Distribution Circle. The substation with parameters 220KV/132KV is located at Hamirpur(M/Sidh) and parameter 132 KV/33 KV is located at Hamirpur (Anu). The number of HV Substations 33/11 KV to feed the Villages in the Distribution Circle is twenty.

Single line diagram representing EHV, HV and LV Substations including Source of Generation feeding the District Distribution Circle/Block/Villages to meet electricity demand is attached as Annexures.

Augmentations of the Electricity Supply infrastructure to enhance the supply to the respective Districts/Blocks/Villages in the State have been done over the years.

Table 12: Infrastructure Augementation – Hamirpur District

Year	**Infrastructure Augmentation**					
	11 KV Feeders		**Distribution Transformers**		**440 V Feeders**	
	Nos.	**Length Km.**	**Nos.**	**Total KVA**	**No. of Poles**	**Total Kms.**
2008-09	-	-	-	-	65	4.3
2009-10	Vari-ous	8.706	18	450	334	22.5
2010-11	Vari-ous	23.850	40	1000,	846	53.5

Broha Village has been electrified since year 2000, and 50% of APL families had electricity connection since 2002. Hence benefits accrued due to electrification could not be ascertained. Village Broha has a school in adjacent village. School has all facility. Average income of the BPL family is Rs 48600 and that of APL family is Rs 117000/- per annum. Both APL and BPL family have agricultural land. Every family is taking benefit of Electricity. 30% APL family have refrigerator. Average consumption of electricity and Kerosene for APL family is Rs 73 and 23 respectively. Average consumption of electricity and Kerosene for BPL family is Rs 60 and 23 respectively.

Sasan Brahmna Village has been electrified since year 1976.

The village has Middle school, and adjacent school has Secondary (up to 12th) school. Secondary school has computers and allied facility. School got electrified in 1986. Middle school does not hav computer facility. Average income of the BPL family is Rs 19000 and that of APL family is Rs 232000/- per annum. 70% of APL families are engaged in services (Government and Private) and they enjoy all electrical gadget. However their response showed less electricity consumption.. Both APL and BPL family have agricultural land. Every family is taking benefit of Electricity. 30% APL family have refrigerator. Average consumption of electricity and Kerosene for APL family is Rs 70 and 7 respectively. Average consumption of electricity and Kerosene for BPL family is Rs 50 and 5 respectively. The villages receive electricity bill tri-monthly. BPL families avail NREGA and their women work in Aanganwadi.

Gangot Khurad village has population of 27 households. The village has small school that is up to class 6. Village electrification was declared in 1988, and the School was electrified in 1993. In the village 2 BPL families were identified, who have received electricity in the programme. Both of them are engaged in NREGA scheme. They own small agricultural land. The income of BPL family is rupees 33000. The family spend on an average rupees 68 for electricity and rupees 35 on kerosene. Sample of 10 APL families were surveyed. Two Head of family were employed with government department. Few of them were engaged in NREGA scheme. The villagers were very happy with augmentation of electricity network. The average income of APL families are rupees 118000 and they consume Rs 84 and Rs 35 worth of electricity and kerosene respectively. The village has persons working with private enterprises.

Khurral-II has population of 38 households. The village has small school that is up to class 6. Village electrification was declared in 1971, and the School was electrified in 2010. In the village 1 BPL family was identified, and he owns agricultural land. The income of BPL family is rupees 30000. The family spend on an average rupees 50 for electricity and rupees 35 on kerosene. Sample of 10 APL families were surveyed. Three Head of family were employed with government department. Four of them were engaged in NREGA scheme. The villagers were very happy with augmentation of electricity network. The average income of APL families are rupees 90000 and they consume Rs 61 and Rs 35 worth of electricity and kerosene respectively. The village has persons working with private enterprises.

Pukhrani Village has population of 50 households. The village has small school that is up to class 6. Village electrification was declared in 1971, and the School was electrified in 1989. The school operates in the time slot 9 am to 3 pm. Health center was not found in the village. There are about 11 BPL families, and 10 of them own small land. They are mostly working as part-time labourers and NREGA scheme. The average income of BPL family is rupees 26400. The families spend on an average rupees 85 for electricity and rupees 28 on kerosene. Sample 12 APL families were surveyed. 50% of them had retired person as head of family. They were not forthcoming with profession of other household members. As they taken connection many years back hence could not explain benefits of electricity. The average income of APL families are rupees 137000 and they consume Rs 205 and Rs 30 worth of electricity and kerosene respectively. The village has two skilled workers, and persons working with private enterprises.

The status of village electrification in indicated in the table 13. The villages Gangot Khurad and Broha has been electrified for more than one year. The rest of the villages have been electrified in the second half of 2011.

Table 13: Project Progress in the Hamirpur District in Himachal Pradesh

HAMIRPUR					
	Gangot Khurad (1061800)	Khurral-II (1113000)	Pukhrani (984100)	Sasan Brahmna (987500)	Broha (1040300)
BPL Household electrified in the villages in Numbers	2	1	11	4	1
Total Number of BPL and APL Household in the villages in Numbers	27	35	50	54	BPL 7 & APL 53
APL connection after RGGVY in the Villages	0	0	0	2	59
Dates of village energization and handing over of Asset:	Aug-10	Sep-11	Jul-11	Jun-11	Oct-10
Energy supplied in the villages in Kwh	3250	5340	8700	8000	

Energy billed in the villages:	2800	5020	72080 KWH (Tri-monthly)	7770	
Collection of bills and bills outstanding in the villages.	100%	Collection 9372 outstanding 283		15330	14141
Transformer Capacity for the village and average BPL and APL load:	25 KVA BPL 1.96 APL 2.450	25 KVA BPL 0.180 APL 23.400	25 KVA BPL 46.04 APL 0.920	25 KVA BPL 1.00 APL 2.00	25 KVA 11.4 KWH
Transmission and Distribution losses on the feeders feeding the above villages (Feeder level Data	18%	19.20%	28%	25%	16.10%
Agriculture and Commercial Small Scale Industry		NIL	1 irrigation PS		1 Irrigation PS, 2 SSE,
Average electricity demand growth in rural areas in your circle.	2 % (Approx 2 Kw)	2% (Approx 2 Kw)	6%(3.28 Kw to 6.5 Kw in 3 years	6%	6% (1.7 Kw to 20 Kw in 3 years
Substation feeding the electricity supply	33/11 KV 2*3.15 MVA Barsar	33/11 KV 2*3.15 MVA Bhoranj	33/11 KV 2*5 MVA Nadaun	33/11 KV 2*1.60 MVA Rangaus	132 KV Substation at M/Sidh

Single line diagrams ;132 KV/ 33 KV/ 11 KV systems feeding the above villages.	Please refer the Annexure A to Annexure F				
HT and LT line	1.238 Ckt Km HT line 0.48 ckt Km of LT **line**	.1750 Ckt Km HT line 0.05 ckt Km of LT **line provided**	.7350 Ckt Km HT line 0.36 ckt Km of LT **line provided**	Nil	0.080 Ckt Km HT line 0.27 ckt Km of LT **line provided**
% of meter failed in the villages	7%	Nil	Nil	2%	Nil
Comments	Consumers of Village Ghangot Khurd are satisfied after installation of 25KVA; 11/0.4 KV S/Stn at Ganghot Khurd under RGGVY Scheme				

The Status of Rural Electrification in the **UNA DISTRICT** was discussed with HPSEB executive. The information gained is indicated in Table 14 below

Table 14: Status of rural electrification in the Una district up to Nov. 2011

Sl. No.	**Village Parameter**	**Total No. of Villages**		**Total No. of House Holds**		**House Holds Connected**	
		Total Nos.	**Covered in RGGVY Nos.**	**BPL Nos.**	**APL Nos.**	**BPL Nos.**	**APL Nos.**
1	Grid Connected Villages	All 758	94 partly	17600 approx	146500 approx	17450	145441
2	Villages to be Connected to Grid	NIL	NIL	-	-	-	-
3	Villages considered	NIL	NIL	-	-	-	-

	remote require DDG						

The district has one Distribution Circles supervised by one superintending engineer, supported by executive engineers in 3 divisions. The circle manpower consists of 15 assistant engineers, 68 junior engineers. There are 44 Meter Readers working in the Distribution Circles

The Connectivity of District/Blocks/Villages with Grid was discussed with them. The circle has the EHV Substation to feed the Distribution Circles at Jassour– 220KV/132 KV, and at Una,Amb, Gagret - 132 KV/33 KV. The 10 number of HV Substation are functioning to feed the Villages in the Distribution Circle 33/11 KV. The HV Substations 33/11 KV to feed the five Villages under survey in the District is located at Bangana, Basal, M/pur

The HPSEB has given to Franchisee the responsibility of **Billing. The departmental executives were positive that they can implement** RGGVY programme and **execute departmentally**

The district has potential for accelerated economic growth. Rural populations are happy with the development. Augmentation of the infrastructure in the circle will be needed to cater to growing consumer demand from agriculture sector and industrial activity developing in the rural area. The potential growth parameters envisaged by HPSEB for Rural Electrification and Distribution System planning in the district are redesigning supply Network and Capacity augmentation of transformer at various levels. The Augmentation of the Electricity Supply infrastructure is done as per yearly plan to enhance the supply carrying capacity to the respective Districts/Blocks/Villages in the State are indicated in table 15 below.

Table 15: Infrastructure Augementation – Una District

Year	**Infrastructure Augmentation**					
	11 KV Feeders		**Distribution Transformers**		**440 V Feeders**	
	Nos.	**Length Km.**	**Nos.**	**Total KVA**	**No. of Poles**	**Total Kms.**
2008-09	-	-	-	-	178	11.5
2009-10	Various	6.5	15	375	425	26.5

2010-11	vario us	18.5	32	800	965	60.5

The information compiled for the district is highlighted in table 16. The village infrastructure was recently energized and the BPL families have been covered. In general villagers are happy with the connection. The response from the JE and lineman can be obtained at the later date.

Table 16: Project Progress in the Una District in Himachal Pradesh

District: UNA					
Block --->	Dhundla	Dhundla	Amb	Una	Una
Villages --->	GHARTHOLI (01161600)	CHAKROA (6/13) (01163300)	Kuthar Khurd (01142400	CHAUKHYAL (01191900)	RAISARI UPPERLI(192) (01188100)
BPL Household electrified in the villages in Numbers	3	10	2	4	72
Total Number of BPL and APL Household in the villages in Numbers	3+20=23	10+29=39	2+34=36	4+ 26=30	72+418= 490
APL connection after RGGVY in the Villages	NIL	NIL	258	NIL	43
Dates of village energization and handing over of Asset:	Jan-12	Jan-12	Jan-12		Dec-11
Energy supplied in the villages in Kwh					
Energy billed in the villages:	Not Yet covered in Billing cycle	Not Yet covered in Billing cycle	Not Yet covered in Billing cycle	Not Yet covered in Billing cycle	Not Yet covered in Billing cycle
Collection of bills and bills outstanding in the villages.	Not Yet covered in Billing cycle	Not Yet covered in Billing cycle	Not Yet covered in Billing cycle	Not Yet covered in Billing cycle	Not Yet covered in Billing cycle

Transformer Capacity for the village and average BPL and APL load:	25 KVA BPL =0.5 APL = 1.5	25 KVA BPL =0.4 APL = 1.5	25 KVA BPL =0.8 APL = 2.4	25 KVA BPL =0.5 APL = 2.5	25 KVA BPL =0.2 APL = 1.5
Transmission and Distribution losses on the feeders feeding the above villages (Feeder level Data	25.72	25.72	18.94	3%	4.70%
Average electricity demand growth in rural areas in your circle.	5%	5%	5%	5%	5%
Substation feeding the electricity supply	33/11 kV S/S Bangana	33/11 kV S/S Bangana	33/11 kV S/S Amb	33/11 kV S/S Mahatpur	33/11 kV S/S Basal
Single line diagrams 132 KV/ 33 KV/ 11 KV systems feeding the above villages.	Annexure G to Annexure K				
Failure of Transformers in the villages:	NIL	NIL	NIL	NIL	NIL
% of meter failed in the villages	NIL	NIL	NIL	NIL	NIL
Comments	The above villages have been taken over recently; all the response can taken after six months				

Chakroa village has 39 families. Average monthly income of BPL families is rupees 1700. Electricity connection is yet to be provided to two more BPL facilities. Of the 10 APL families four are in government jobs and rest have low income. The average APL income is around Rupees 10700. Village does not have health centre. The average consumption of electricity is valued at Rs 150.00 and the bills are received bi-monthly. Village was declared electrified in 1987.

Ghartholi Village has 23 Families. Average monthly income of BPL families is rupees 1800. Electricity connection is yet to be provided to two more BPL facilities. The average APL income is around Rupees 4400. Village does not have health centre.

The average consumption of electricity by BPL family is valued at Rs 60.00 and APL family consumes approximately Rs 130. The bills are received bi-monthly in their area. The village was electrified in 1987, and the BPL families obtained connection under RGGVY programme. The villagers are aware of RGGVY programme by the government.

The Village Kataur Khurd has 484 families (26BPL + 258 APL). The village obtained electrification status in year 1988. Village has a school that provides education up to class 6 and the school was electrified in 1998. The village has a Small health Centre that has refrigerator. The public institutions are all electrified. Commercial activities were observed in the village, they had shops, Flour Mill. Average income of BPL families per annum is Rs 25000 and their expenses on electricity and kerosene Rs 133 and 35 per month respectively. The village has been using NREGA scheme in operation, where both APL, BPL work for village development. Average income of BPL families per annum is Rs 126000 and their expenses on electricity and kerosene Rs 560 and 205 per month respectively

The Village Raisari Upperli has (490) families (72 BPL + 418 APL). Village was declared electrified in 1971. The Village has school that provides education up to class 6. Commercial activities were observed in the village, they had shops, Flour Mill. Average income of BPL families per annum is Rs 23500 and their expenses on electricity and kerosene Rs 80 and 25 per month respectively. Average income of APL families per annum is Rs 75000 and their expenses on electricity and kerosene Rs 115 and 25 per month respectively.

The Village Chaukhyal has 30 families (4 BPL + 26 APL). Village was declared electrified in 1987. The Village has school that provides education up to class 6 . Electrification of School was done in 1994. Both BPL and APL family members are working NREGA scheme for development of village infrastructure. They all have agricultural land, where they grow crops. The APL families are also engaged in commercial activities. There was a tailoring shop, diesel pump set.

Himachal Pradesh has previous history of electrification. Hence overall benefits of electrification could not be captured. BPL families were happy with new connection. They

are in the process of gaining benefits of the programme. Benefits that was evident was implementation of social justice by providing equality in access to electrical energy.

The HPSEB had been engaged in rural electrification for many years before RGGVY programme. Consumers have also grown over time. The state SEB maintained healthy picture of rural electrification. In the focused meeting following points were highlighted:

1. There is frequent tripping of the transformer and the tripping 11 kV line. It was examined that because of long extension of LT lines that particular village in Mandi district feeder trips frequently. There is an urgent need to put additional 33/11 kV Substations to take of the load. RGGVY awareness among consumers is poor, must be increased

2. HPSEB employees mentioned that they do not have enough Manpower to handle the faults in Remote locations.

3. Almost all the villagers said that although there has been an improvement in the quality of life after the village got electrified but still supply of electricity has to be continuous to sustain the improved quality of life.

4. It was suggested that a village energy committee can be formed and a resolution will be passed in the village and will be communicated to the HPSEB staff. Also the Village energy committee will be trained and some capacity building will be needed with the support of the Junior Engineer, SDO. The suggestion was accepted by HPSEB engineers. The task of village energy committee has to be defined

5. It was also indicated that the 33/11 KV substation will be completed soon, which will reduce the Tripping problems. Challenge is how to maintain the RGGVY infrastructure in Future? Considering voltage drop, proper HT/LT ration has to be maintained in rural areas. The network design may be analysed, for better services.

6. The district, where-ever RGGVY is completed a dedicated work force should be created to look after the infrastructure otherwise planning of maintenance will be challenging. Ownership of the Infrastructure is a issue. There should be separate fund for maintaining RGGVY infrastructure. Average Cost of service on rural electrified village should be carried out. Commercial Viability of rural feeders should be carried out to properly plan how to bridge the viability gap.

7. A detailed study should be carried out for checking capacity of backbone infrastructure. If future augmentation is needed it can financed jointly by REC under RGGVY programme and State.

8. The detailed future demand estimation should be carried out. Small scale industry should be promoted in the villages through other schemes of the Government. So that a substantial demand can come up from the village which enhance the commercial viability of the rural electrification.

9. RGGVY infrastructure can be linked up to R-APDRP scheme. An intelligent distribution system for electrified village can be developed for effective monitoring.

10. DDG project can be undertaken. For this availability of good distribution infrastructure is the prerequisite.

11. Few Stakeholders proposed energy club concept should be extended to the village levels. The modalities and functioning of energy club could not be discussed.

GENERAL OBSERVATION

(i) The side by side inspection of the work execution by PIA is needed as the expertise in handling Turnkey projects is lacking.

(ii) The site engineers are facing big problems due to shortage and non availability of materials for repair and maintenance work. Tools are not available for maintenance work. Site technicians claim they use personal tools. Maintenance workers require rain coat and gum-boot during rainy season and snowfall time. The maintenance work is done without season dependent safety gears.

(iii) The Process cycle for maintenance is as following: (a) Consumer inform to concerned office for the breakdown of power supply (b) Complain is registered in the maintenance register (c) The work is attended to and reviewed

(iv) Performance of execution duration of time is as per the break-down as following: (a) For Pole maintenance take 5 to 6 days (b) For repair of damaged jumper, it takes 1 to 2 hour after travel time to reach the site. (c) For repair of damaged Transformer it takes 1 to 2 days depend on the availability of transformer at site. (d) For repair of damaged insulator is take 1 hour after travel time to reach the site (e) For repair of damaged disk it takes 2 hour after travel time to reach the site. The travel time to reach the site is common factor.

Feedback from Implementing Agency

Implementation of RGGVY in Hamirpur District was executed by Himachal Energy Pvt. Ltd. New Delhi. Apart from the VEI the agency erected more than 1800Km of LT Line and more than 500 Km of HT line. The implementation period allocated in the Districts was 15 months, completed in 30 months. Only response was teething problem. Their suggestion for improvement was as follows;

1. Identification of village should be done properly and D.P.R. should be prepared accordingly so that there is be no deviation in the scheme, financial as well as physical during the execution.
2. Provision should be kept for 3ø, 2ø and 1ø L.T. Lines/extensions including augmentation of existing system network e.g. conductor & poles etc.
3. Sufficient provision for compensation to the land owners in lieu of land, trees & crops should also be made in the scheme.
4. Identification of BPL families should be done before preparation of D.P.R.

Shyam Indus Power Solutions Pvt.Ltd.Delhi implemented RGGVY infrastructure in Una District, Apart from the VEI the agency erected more than 1500 Km of LT Line and more than 290 Km of HT line. The implementation period allocated in the Districts was 13 months, completed in 25 months.

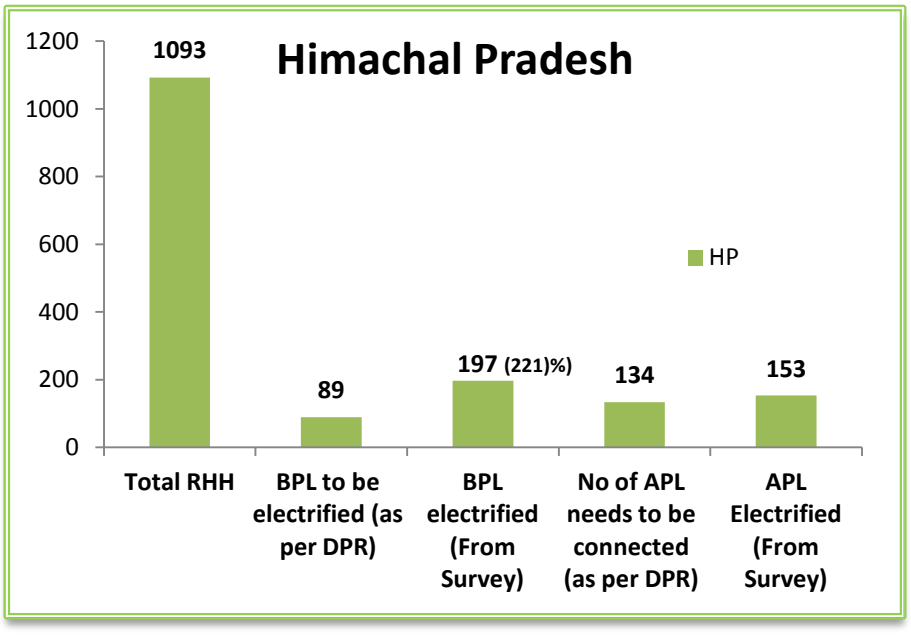


Figure 4.1: Progress made under RGGVY scheme in Rural Electrification.

The state has separate BPL list and that is available in the net. The three district of the state had been electrified, long back and had procedure to release connections. The progress made in rural electrification under RGGVY programme is shown in Figure 4.1. Considering five districts 221% of connections were released over DPR value. 153 APL connections were released with the newly available The state may consider separate feeder for electricity distribution to agriculture consumers, as has been done in Gujarat. The state is in the process of enhancing its irrigation potential from current 18%. Proper choice of irrigation pumps as recommended by BEE may facilitate in energy conservation in agriculture sector.

The implementations in all districts were done in double the time frame. The problem may have been in (a) specification and scope of work in the contract were not matching the ground reality (b) forest clearance from the appropriate agency for laying HT cables got delayed (c) land use permission from private landowner for right of the way for laying LT cables. And HPSEB were having first experience of managing turnkey contract, being planned in district wise in conformity of Bharat Nirman programme. Three villages in Mandi districts were in Bilaspur circle. Table below indicates the implementation in each district..

District	Average implementation time for Village connection	Delay
Chamba (10th Plan)	70	46
Mandi (11th Plan)	35	11
Una (11th Plan)	46	22
Hamirpur (11th Plan)	35	11

In Una, Mandi and Hamirpur delays in implementation has been reported. The reasons attributed are (a) material inspection clearances (b) public dealing and forest clearance, responsibility centre appears to be ambiguous (c) Approved BPL list availability and there were some BPL covered under state government scheme (d) flexibility in the scope of work and contract. However it may be noted that the SEB supervisory wing were handling turnkey contract for the first time, and there were ambiguity on content of DPR. There are slackness in professional management due to frequent change of responsibility on RGGVY, hence site inspection gets neglected. Material Inspection and GTP Approval should be done expeditiously

For addressing implementation issues the points need to be considered are (a) Clarity in Scope of works defined in the DPR may be with some flexibility specially for the hilly terrains and remote households, (b) clarity in the material specification, (C) Coordination between REC, HPSEB and (d) effective Collaboration between Project Implementing Agency (PIA) and the HPSEB; so as to resolve ground level problems with speed and clarity.

State government has streamlined the Rural electrification programme since 1988, managed by HPSEB. In future the task will be to augment the network, provide separate feeder for agriculture and commercial as approved by design. The HVDS design will be incorporated in the villages. During the programme the state has developed local contractors. Considering all these factors the state may be permitted to plan augmentation within the responsibility of Electricity distribution circle, and projects may be budgeted yearly basis.

Chapter 5

Socio-economic Status in the Surveyed Villages

Himachal Pradesh is the mountaneous state of India. Out of 13 hill states and regions, The Village of Himachal Pradesh is observed to be the most progressive state, which has made remarkable achievements in socio-economic development of its people. Demographic profile in the state are scattered and small. Schedule Tribes are concentrated in tribal districts of Lahaul & Spiti and Pangi valley of Chamba district. The villages are dominated by the Tribal population. The economic and social benefits achieved by rural electrification at the household level are multidimensional, and both tangible and intangible. The household level impacts are mediated through availability of electricity in the household as well as outside the household. The beneficiary sectors are agriculture, Horticulture, commercial activities—shops and establishments, and cottage industry etc. The multifaceted impacts and benefits are either direct or indirect. The direct impacts are mostly economic, livelihoods and reflected in enhanced income, and employment, and optimized expenditure pattern, surpluses, savings, and asset building. Most indirect impacts are related to the social aspects of life, which include, among others, such areas as education, health, women's status, modernization etc. Positive responses were Comfort (Yes); Education (yes, children can study in the evening); Increase in Income (no reply may be as the population has electricity facility since long); More Security (Yes) Water Supply (Yes); Better Health (Yes)

Arts and Crafts

In the surveyed villages very few families in each village were found to work in commercial activity other than agriculture. General talk with board executives highlighted that electric lighting makes evening activities possible, and many girls say they prefer to stay in the village and earn a living using a sewing machine, weaving or knitting. After Elecrification women were found engaed in handicraft practics for the finacial assistance to their family carpets; leather works, shawls, paintings, metal ware, woodwork and paintings are the area of Handicraft where many women were engaged themselves. Increased economic opportunities for women in the home and the village are perceived as one outcome of electrification.

Education

Primary schools is found in the surveyed villages but for medium and higher education people need go to nearby town or big villages of the villages. The schools have been provided with the facilties light light, fan, etc and the secondary schools have computers. There is a shortfall of several teachers in the rural schools. The girl education is being pursued.

Women and children benefit directly from electrification. They have additional hours to work in the evening in the domestic chores. Many house holds have television sets that offer comfort during evening leisure time. The overall literacy rate was claimed to be much higher after electrification. The overall literacy rates for both male and female in the electrified were significantly higher, especially due to the household's access to electricity which has contributed much both in economic terms as well as in raising awareness about value of education.

Employment

During survey the response Electricity generates employment. The impact on employment was both direct and indirect. In agriculture, several persons are directly involved in farmlands using rural electricity connected irrigation equipments. Rural and wholesale shops using rural electricity employ several persons. There has been an enormous spill-over effect of rural electrification on employment in various support-services.

Agriculture

Agriculture contributes nearly 45% to the net state domestic product. It is the main source of income as well as employment in Himachal. Agriculture practiced in the villages is both rain-fed and irrigated However, agriculture practices suffers from certain limitations, especially in the production of food grains due to Geographical nature. 18% of the total farm land is irrigated. One of these reasons is that the area under cultivation can't be extended to an appreciable extent due to unavailability of water for irrigation. Use of electricity for irrigation has potential for rapid growths. Here ESCos can play a significant role. A additional skill-set will be developed in the area. The villagers are so shifted more towards cultivating cash crops as per the agro-climatic conditions.

Hamirpur, Mandi and the Una District Villages are the major producers of the wheat, maize, rice and barley cereals.Though the state is deficient in food grains, it has gained a lot in other spheres of agricultural production such as seed potato, ginger, vegetables, vegetable seeds, mushrooms, chicory seeds, hops, olives and fig. Seed potato is mostly grown in the Mandi ,Una and Lahul areas. Villagers are being made to cultivate of crops like olives, figs, hops, mushrooms, flowers, pistachio nuts, sarda melon and saffron.

Health

As regards the accessibility of health facilities to the surveyed villages, maximum of villages have Sub-Centres within the village itself and as many of the villages are within 5 km. (However this facility is not available for remote and hostile regions) distance from a Sub-

Centre. Some of villages have a governmental health facility. There is dearth of doctors, only few of villages are having doctors. It varies from in Lahul & Spiti where less percentage comparison to other District Villages. Ther is a report that much higher proportion of child delivery (last birth) in the electrified households was assisted by medically trained persons. In terms of assistance in child delivery by medically trained persons, the electrified households show a much better. One of the most spectacular influences of electricity was found on the infant mortality rate. The infant mortality rate in the electrified households is reduced.

Drinking Water Quality

In the Survey it is found that villages were suffered from poor quality drinking water to drink and cook their meal before the Electrification. The water is, hard and not good to drink. It was observed that vilagers were dependent on rivers as a source of drinking water. After Electrification of village establiment of water pumpsets through which potable water is avalable in plentiful amount. Adding electric-powered wells that provide clean water that can prevent many water-borne diseases.

Chapter 6:

Long Term Village Electrification Initiative from State/ HPSEBs

The development of Himachal Pradesh have been catalyzed by the rural area development and development of hydropower projects. The consumption in the rural sector is increasing gradually, the consumtion in the rural industries and agricultural sector is increasing rapidly (refer to table 17). The state government is sustaining the growth rate in both these sector by various development scheme as is projected in the previous Himachal Pradesh development Report. This process will be sustained in future.

Table 17: Himachal Pradesh – Consumption in rural areas and its increas

	Consumption in rural areas	Increase in Consumption
	Kwh /person /pa	pa %
Rural per capita Energy Consumption (Domestic)		
FY 2007-08	350	5
FY 2008-09	368	5
FY 2009-10	385	5
FY 2010-11	405	5
Rural per capita Energy Consumption (Industrial)		
FY 2009-10	1450	15
FY 2010-11	1675	16
Rural per capita Energy Consumption (Agriculture)		
FY 2009-10	550	10
FY 2010-11	600	9

The state SEB has prepared Rural Electrification Plan (REP) and that has been notified and communicated to the Ministry of Power (MOP). The Rural electrification plan is for 11th five year plan. The state will have to revise the REP in the context of census 2011, experience gained in last seven years, approved hydro-power projects, Himachal Pradesh Development plan. Some of the observations of state SEB are

1. Once the RGGVY is completed, there will be large length (network) of LT lines in HP. This might increase the technical losses of the total system. Some measure must be thought of, in advance.

2. There is a need to augment the capacity of sub-transmission line. The Operation and Maintenance of RGGVY Infrastructure is going to be huge Challenge in Future. Human resource development is very important.

3. Currently there is no HVDS system, and none is being planned under RGVVY. However its potential is there but the commercial viability has to be carefully examined in RGGVY context. The village population is dispersedly located hence electrification of village having population less than 300/ 100 can be optimized with proper analysis.

The proposed rural electrification plan that is compliant with the 12th five year plan and the census 2011 may consider following growth plan:

- The state government may consider the Gujarat model of "Jyoti Gram Yojana" where they have separate feeder for agriculture and domestic and commercial. They can ration power supply to pump-set at stipulated schedule.

It is reported that lower regions of the state is attracting many industries as they find the state has sufficient power most of the year, water availability. This will generate power deficit in the long run. The state can look into development of efficient renewable energy system. Ministry of power has initiated trading of renewable energy certificates and renewable purchase obligations. The state has good renewable energy resources.

- Development of Decentralized Distributed Generation system based on renewable energy. The state has great potential for mini and micro hydel power station with many rivulets in the hilly terrain. A study may be conducted to estimate power generation potential from mini and micro hydel projects
- The Gurdwara in Solan District has developed model solar power system compatible to the slope of the hills. This model may be popularized in other district state offices.
- The state should have good wind power resources. The other renewable systems should be hybridized with wind power system that can be used to service the DDG schemes.

Chapter 7:

Decentralized Distribution Generation (DDGs)

Himachal Pradesh state is surplus in power availability, except for winter season when the glacier fed rivers dry up and there is no rain except for snow. The state has major (central) hydro-power projects, and these are primary source of power. During winter-season they import power to meet ~ 12% deficits from neighboring states. There are 9 rivers having multiple rivulets. Major river basins of the state are Chenab, Ravi, Beas, Sutlej and Yamuna Basin. The first four basins are part of Indus Basin and Yamuna Bain is part of Ganga Basin. The state-government owned hydropower stations in operation are 20 in number having power generation capacity of 467 MW. There are 9 HP systems having 5491 MW capacity that are due to centre and state collaboration effort. Two private controlled hydro power stations which have been constructed are having a capacity of 386 MW, and the Himurja projects contribute approximately 26 MW. The 11th five year plan hydropower projects are being implemented by central, state and private sectors. There is process of approval for the 12th five year plan project, totaling 5615 MW. The state government has announced investor friendly New Hydro Policy for encouraging Private investment.

The state has good repository of Biomass that can be sustained. On DDG system no answer was available.[3] The state has micro-hydel potential and also a very good forest cover. Forest fall outs can be collected and used for bio-generation for subsequent use.

The ministry of New and Renewable Energy has implemented a total of 2221 solar systems in the state of Himachal Pradesh. The break-up is (a) Solar Home Lights -500 (b) Solar Street Lights 1520 (c) Solar Lanterns 200 (d) Solar Power Plant 1(one).

In additions there are various corporates who are implementing renewable energy system in the state under the corporate social responsibility and obligation.

DDG scheme of RGGVY programme should have more flexibility. Considering the climate profile of the state and wind energy, they should encourage hybrid system. DDG project will be specific to the resource availability and location. This will vary from place to place and from project to project. The harnessing of wind energy should be encouraged, that can sustain power especially during the winters

Himachal Pradesh is endowed with a huge large estimated capacity of the category of Micro and Mini Hydroelectric Schemes. This sector development is in states' jurisdiction which may not have been investigated and accurately estimated. The development in this area will

[3] http://himurja.nic.in/

facilitate the state in obtaining Carbon neutral status as well as maintain water table level for sustaining developing irrigation network. The development of micro & mini-hydel system will not generate population displacement, submerged area issues, and environmental degradation hence this can be implemented quickly in comparison of major projects that take long duration.

A template for mini and hydro electricity projects can be standardized so that it can be attuned to the geo-morphology of the state. Himachal Pradesh lies in a sensitive seismic zone. The project package can be developed by the state SEB. The package can be awarded to turnkey contractor as per standard procedure. The project package will facilitate in standardizing DPRs.

Chapter 8:
Franchisee Models in Operation

Currently the HPSEB has not appointed any Franchisee for the rural electrification. They have just started the process of finalizing Franchisee by tendering process. The initial indicated rates were not commercially attractive for the entrepreneurs and rates are being revised. Currently, in certain places in H.P. billing and collection cost is accounted as high as 35 paisa per unit. The charges of the local agents (default franchisees) is (a) for preparation and distribution of bills is Rs 5/-00 per bills and (b) collection Rs2.5/-00 per bill.

The senior officers said that Franchisee system will be established in the state. Lack of manpower of HPSEB will pose serious constraint for successful operation and maintenance of RGGVY infrastructure. Initially, these franchisees will be assigned the task of billing and revenue collection only. HPSEB had tendered for requisitioning application from interested parties (on an individual basis, and how they will structure their services is up-to them) for assigned role in rural electrification. Franchisee scope of work will include all connection below 20 KW load. The average tendered quotation indicated is approximately Rs. 33.00 per house-hold. The tender had specified minimum qualification for potential tender as matriculation having 2 years experience of working in electrical system. The qualification may be relaxed in case of remote villages but their competencies will be ensured, considering electrical safety norms. The state has arranged training for its employee serviced by REC, Hyderabad. The services of REC, Hyderabad will requisitioned for enhancing capacities of newly appointed franchisee.

Chapter 9:
Performance of Distribution Utilities and Rural Network

Himachal Pradesh has rationalized the tariff structure and the State electricity regulation commission has announced a multiyear tariff as indicated in Table 18. The Himachal Pradesh Government provides subsidy support available to domestic and agriculture consumers in the rural area, upto a specific limit. The subsidy is considered on per unit basis while computing revenue for each of the consumer category. The state declared MYT in the year 2011 for 3 years (2012-14). The HPSEBL has stated that tariff of subsidized class of consumers should also be brought to 80% of the average cost of supply. The regulatory commission has ordered that the subsidy amount (~140 crores rupees) should be paid in advance to the SEB, as per provision of section 65 of the Electricity act 2003. The tariff order is defined in the table below;

Table 18: Applicable Tariff Rate in Himachal Pradesh Energy Charge[4]

Sl. No.	**Category of Consumers**	**Tariff Rates**				
		Consumption Range ….Kwh to …Kwh	**Rs/Kwh**	**Consumption Range ….Kwh to …Kwh**	**Rs/Kwh**	**Rebate/ Surcharge**
1.	BPL Domestic (Vill)	0--40	2.10	0--125	2.50	1.40/kwh rebate
2.	APL Domestic (Vill)	0--40	2.35	0--125	2.50	1.35/1.40 rebate
3.	Agriculture	0 --onwards	2.50	--	--	2.00
4.	Commercial	0.--onwards	4.60	--	--	--
5.	S S Enterprises	0--onwards	3.70/ 3.30	single part tariff two part tariff	--	--
6.	Others (Specify)	--	--	--	--	--
7.	Estimated Average Subsidy to Rural areas Rs/Kwh	75 crore	--	--	--	--

[4] Rates available from HPSEB web-site

Note:

In the case of **Below Poverty Line** beneficiaries, the concessional tariff will be available for use of electricity by these families upto a maximum of 40 units per month. In case this limit is exceeded, the normal domestic tariff slabs of 0-125, 126-250; and above 250KWh per month respectively will apply.

"With respect to consumers under Water and Irrigation Pumping Supply (WIPS) category, the energy charges shall be Rs. 0.50 per kWh to the consumer category upto 20kW under single part tariff and Rs. 0.50 per KVAh only for LT category under two part tariff. These revised energy charges on the account of Government subsidy would only be applicable to agricultural and allied activities, and which are paid for by individuals / user groups."[5] As such the Subsidized rates for Agriculture and Allied Activities of category of consumer shall be as under:-

Table 19: Subsidized rates for Agriculture and Allied Activities

Consumer Slab	Tariff (in Rs./unit)	Subsidized tariff of Govt. of H.P. (in Rs. Unit)	Per unit subsidy provided by GoHP.
Single part Tariff (<=20KW)	**2.50**	**0.50**	**2.00**
Two part Tariff (> 20KW) LT supply	**3.50**	**0.50**	**3.00**

Comments upon the Failure of the Distribution Transformer

A study was made regarding the percentage failure of distribution transformers in the state. As already mentioned in the report, Himachal Pradesh is a hill state with about 50% mountainous regions with high altitudes, clad with snow for most part of the year. It is having many remote areas having scarce population. The distribution network in the state is naturally having distribution transformers installed in many remote areas having long LT lines in the distribution network. Moreover this distribution network passes through mostly thick forest

[5] Himachal Pradesh Electricity Regulatory Commission Shimla; M.S.No.113/2010; M.A.No. 114/2010; Case No. 197 of 2009; In the matter of: subsidy to be provided by the Govt. of H.P. on assount of rollback of tariff in respect of Domestic and WIPS categories in the HPSEB schedule of tariff, 2010; 25.06.2010; Point 3; page 2; www.hperc.org/orders/order**subsidy**10.doc; Accessed February 2012

areas and many locations having perennial landslides. All these result into frequent unavoidable damage to the distribution network, especially in the remote areas and mountainous regions. All this does affect the health of the distribution transformer installed in the distribution network of the state. The distribution transformer failure rate is indicated in the table 20 below over the years.

Table 20: Distribution Transformer Failure Rate (FR) in %

Sl. No.	Financial Year	DTR FR
1	2004-05	5.2
2	2005-06	4.4
3	2006-07	4.9
4	2007-08	6.6
5	2008-09	4.0
6	2009-10	3.2
7	2010-11	4.2

Despite all above facts, clubbed with hostile weather conditions in the state, the H.P. State Electricity Board has been able to keep the rate of distribution transformer failures at much lower level as compared to many other states in the country, by adopting and ensuring the following measures :-

- No compromise to be made with the quality of the DTR's during the complete process of procurement.
- Proper installation of the DTR-substations, with special reference to proper Earthing system layout.
- Lightning arrestors has to be connected to separate independent effective earth.
- Transformer neutral to have two separate earths connected to it.
- Balanced loading upon all the three phases of the transformer by ensuring properly designed and laid out LD system network. This is taken care during downstream design of LT line
- No overloading to be allowed upon the DTR. They monitor the load requirement of villages, and block and take pre-emptive measure to change the transformer, if the load on the transformer increases and reaches design capacity.

- Adding new DTR's or augmenting the substation capacity as and when required.
- Regularly monitoring and updating the transformer earths and transformer oil for its dielectric strength.
- Periodically dehydrating the substation transformer as and when required.
- Regularly monitoring the phase-wise loading of the transformer, especially during the peak loading hours and balancing it accordingly.
- Other utilities may also follow above tips to achieve similar results.

Transmission and distribution Losses

A study was made regarding the transmission and distribution losses in the state. With all the geographical challenges, population distribution in view, it is natural to expect a high degree of Transmission and Distribution losses in the power system of the state. But, on the contrary, it has been pleasantly and commendably found to be one of the lowest in the whole country. The actual figures have been shown in the table 20 for the last ten years, starting from the FY-2001-02 to FY-2010-11. The table 21 shows a general decreasing trend starting from 21.16% in FY-2001-02 to 11.35% in FY-2010-1. The state has been able to achieve this mainly by adopting and ensuring the following measures regularly and meticulously:-

(i) 100% metering of all the consumers in state.
(ii) 100% billing & collection for all the consumers.
(iii) Regularly and vigilantly monitoring and checking the power thefts and strictly and sternly dealing with the consumers indulging in power theft.
(iv) Promptly replacing the dead-stop and defective energy meters.
(v) Regularly monitoring the consumer ledger-accounts with regard to doubtful or nil consumption cases so as to suitably and regularly rectify the same as and when they occur.
(vi) Regularly educating and updating the staff, along-with officers too, with regard to monitoring the T & D losses so as to keep them pegged low.
(vii) Proper technical-designing of the power system, especially the distribution system and regularly continuously augmenting and reorganizing the power system network, with special stress upon the
(viii) Distribution Network; so that the technical losses are able to be pegged at low level.

Table 21: Statement of T & D Losses in %

Fin. Year	Within the state	Overall
2001-02	26.61	21.16
2002-03	24.85	19.25
2003-04	24.03	15.63
2004-05	22.44	16.38
2005-06	18.98	15.29
2006-07	15.94	13.77
2007-08	15.41	13.47
2008-09	14.24 (revised)	13.17
2009-10	14.72	14.7
2010-11	13.42	11.35

Table 22: Statement of Distribution Losses (33 KV & below), within State in %

Financial Year	Distribution Losses in percent
2003-04	25.89
2004-05	25.58
2005-06	21.53
2006-07	17.74
2007-08	16.73
2008-09	15.41
2009-10	15.38
2010-11	14.61

The table 21, 22 and 23 indicates the losses at different stages of distribution in electricity network. The losses are high in Table 22; that has been reduced with improved operation management. There is a scope of further reduction in Transmission and distribution system. HPSEB has been optimizing HT/LT ration by redesigning HVDS network in the urban areas. Based on their experience they will adopt HVDS in rural area

Table 23: Statement of AT&C Losses (33 KV & below), within State in %

Financial Year	AT & C Losses
2002-03	48.46

2003-04	38.63
2004-05	35.89
2005-06	30.98
2006-07	26.16
2007-08	25.85
2008-09	24.29
2009-10	26.28
2010-11	24.12

The state is actively pursuing R-APDRP programme. The programme may be extended to the rural electrification. The instrument system needs to be upgraded SCADA compatible metering system. The readings of intelligent meters should be periodically analysed and the load balancing in the network should be achieved.

Provision of Meters existing in State

HPSEB executives have told that all consumers are provided with operational meters. The defective meters are replaced at the earliest (see table 24).

Table 24: Status of Metering for Different Types of Consumers

Sl. No.	Type of Consumer	Metering %
1	Domestic (BPL)	100%
2	Domestic (APL)	100%
3	Irrigation Pump Sets	100%
4	Commercial	100%
5	S S Enterprises	100%
6	Others	100%

Table 25: Consumption, Billing and Collection in Rural Area in UNA District

	Dec-11	May-11	Ratio
Average Monthly Supply in specified Villages Kwh/Month	52430	31360	1.7
Average Monthly billing in Villages Agriculture Kwh/Month	520	315	1.7

Billing Rate per unit (Calculated)	1.74	1.69	
Average Monthly billing in Villages Rs./Month	92320	53450	1.7
Average Monthly Revenue Collection in Villages Rs./Month	89250	51320	1.7
Bill Collection Efficiency in %	97	96	
Average Cost of Electricity Purchased into HPSEB Rs./Month	225000	94500	2.4

The consumer realed information were available for the district of UNA and Hamirpur. The data in table 25 and 26 indicates the power consumption, billing to the consumer against it and the revenue collection for the rural area in the distict of Una and Hamirpur respectively.

Table 26: Consumption, Billing and Collection in Rural Area in Hamirpur District

	Dec-11	**May-11**	Ratio
Average Monthly Supply in specified Villages Kwh/Month	41510	25640	1.6
Average Monthly billing in Villages Agriculture Kwh/Month	480	320	1.5
Billing Rate per unit (Calculated)	2.00	1.97	
Average Monthly billing in Villages Rs./Month	84060	51040	1.6
Average Monthly Revenue Collection in Villages Rs./Month	81820	49360	1.7
Bill Collection Efficiency in %	97	97	
Average Cost of Electricity Purchased into HPSEB Rs./Month	195000	78000	2.5

The highlights of the two tables are:

a. Ratio of cost of Power purchase in the month of December and May is in the ratio of 2.5 approximately. The state government can plan their power purchase in advance to reduce the ration. The cost of power is high in the winter months. The muti-year tariff may include seasonal variation in tariff fixation.
b. The billing efficiency is of the order of 97%
c. The billing process in the district of Hamirpur is good or can be taken to be tter. This factor may be analyzed

Chapter 10: Comments, Observations and Recommendations

To make the RGGVY Programme more effective so that the optimum benefits of this programme can reach the targeted beneficiary population, in particular, and all people, in general, the following suggestions need to be considered in future:-

(A) Policy Matters

(i) In small hilly and mountainous states like Himachal Pradesh, most of the un-electrified populating households including the BPL families reside in small scattered pockets, particularly in remote hilly/mountainous areas, having a population of less than/far less than 100. Therefore this Population- Norm needs to be revised downwards to cover either for all un-electrified houses, irrespective of the pocket-population or, at least, to cover a population of more than 25.

(ii) The transformers to be provided should be of, at least, 63KVA capacity, since 25 KVA capacity is practically obsolete these days in most parts of our country. This will take care of the ever increasing per capita power consumption, and opportunities provided for additional economic activity in the state.

(iii) The cost provision for a BPL family connection raised from Rs.2200/- to Rs.3000/-per connection. During survey it was told that cost of providing connection to BPL household amounts to Rs 4200 to 4800/-

(iv) For reduction of line-losses in the system, High Voltage Distribution System (HVDS) needs to be incorporated in the RGGVY Programme, where the number of household is more. This may be taken-up in a phased manner.

(v) Norms of DPR should be made a bit more flexible for executing the RGGVY works for those states who show (a) better quality of work, (b) financial discipline (c) targeted time bound achievements (d) hostile terrain such as in Chamba and Lahaul & Spiti.

(vi) Provision for Replacement of the existing old and rotten wooden poles with P.C.C./steel tubular poles should be made.

(B) Technical Matters

For better power supply quality, the following need to be incorporated in future in the RGGVY Schemes:-

(i) Provisions for supply system reorganization be made for rural electrification.

(ii) Supply system strengthening should be allowed by:-

1. augmenting the existing L.D. System and link it with R-APDRP programme,
2. Augmenting the existing sub-station transformer capacity.
3. Integrating the adjoining L.D. Systems suitably, with protective system
4. Providing one Tapping Structure along with one G.O. control Switch in each H.T. Spur line for each new transformer.

(C) General Matters

(i) The contractors complained that they faced problems during the installation of poles form consumer, while providing connection to consumer.

(ii) Though HPSEB has long experience of managing electrification of the state, however it has been opined that the HPSEB officers need training on how to execute projects with turnkey contractors and issue of tender for turnkey contracts. HPSEB executives are not very clear about the financial and taxation part of RGGVY projects, which creates delays. Executives from REC site office have gained experience on process of monitoring and inducing expeditious implementation. The process of sharing experience between REC executives and state HPSEB should be formalized.

(iii) Cost of RGGVY Projects should be much more realistic and cannot have a standard cost for the hilly state like Himachal Pradesh. The cost varies from place to place depending upon terrain. Norms should be more flexible with some limits which will reduce delays in project implementation. The contractor is not able to carry out the job because of cost factor. REC executives maintain that such flexibility exists, the HPSEB executives have to explain the additional cost.

(iv) Sequencing of village electrification in a distribution circle is an issue highlighted, as the turnkey contractors operate on more execution fronts at a time. Lack of BPL, desired network layout information results in incomplete work execution in many villages.

(v) HPSEB executives at distribution circle think that they should be encouraged by Central Govt, REC, may be CPSU-PIA to execute RGGVY programme departmentally. They are already procuring material for repairs and maintenance and in remote location they are providing substantial enabling services to PIA/ Contractors or sub-contractors.

(vi) The rural population must be provided with quality power supply and their involvement must be ensured for development of mini and micro hydel projects. State government can encourage developers in respect of Resettlement, Area Development, Catchment Area Treatment and Afforestation around these projects. These will provide a boost to the rural economy by providing economic opportunities associated with development of this sector. Hydro projects will be located in the hilly regions of the State. These will induce development of transport infrastructure and road network.

(vii) The DDG funded projects will facilitate in development of new and local Contracting Agencies with experienced manpower. They can also form nucleus of Franchisee for high level of maturity. Initially the state government can provide inventory of construction machinery and logistics and capacity building for development.

(viii) Rural electrification plans are difficult to become financially sustainable unless these become part of the commercial operations of Distribution Circles combining urban and rural distribution network.

(ix) National rural electrification policy should be the basis of evolving State rural electrification policy and plan so that electricity could reach each and every house hold.

(x) Policy on providing subsidies for rural electrification should be clearly defined so that the subsidies could be gradually reduced to zero as per the intent of the EA-2003.

(xi) DPRs for further investments need not be District based or Centralised Investments should be made, Distribution Circle wise and these should be made cost and profit centres to improve the accountability and efficiency of investments.

(xii) Tariff Structure in Villages should be uniform for Domestic Commercial and Industrial activity to attract growth in economic activities and to speed up commercialisation.

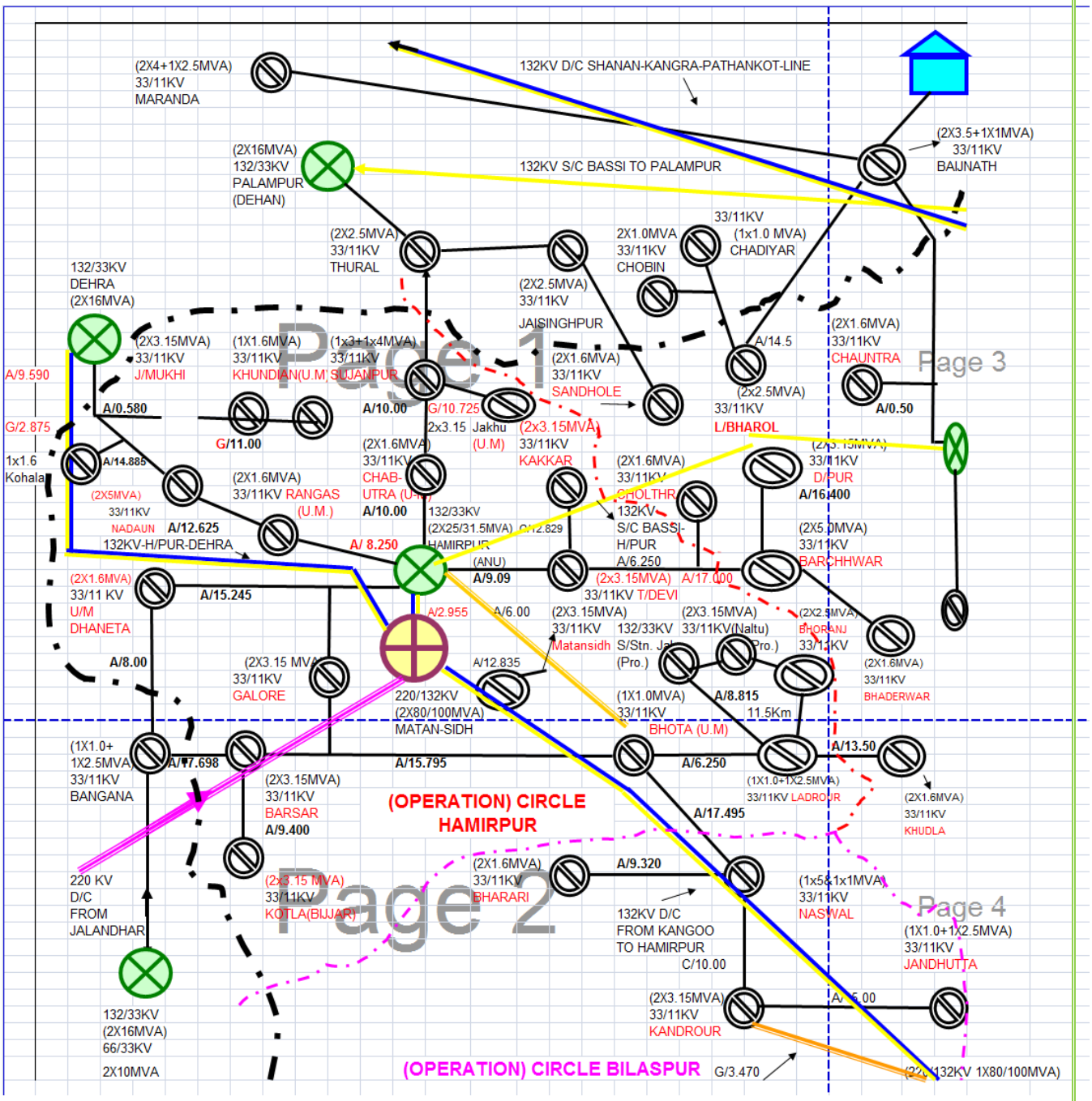
(xiii) Cost Standards used for DPRs in 11th Plan should be re-looked in a more comprehensive way. The role of Central and State Governments in promoting rural electrification to households in villages should be clearly defined in DPRs and MOUs.

(xiv) The assets created under RGGVY should be taken over by DISCOMS soon after completion to prevent theft of material, effective O&M of assets.

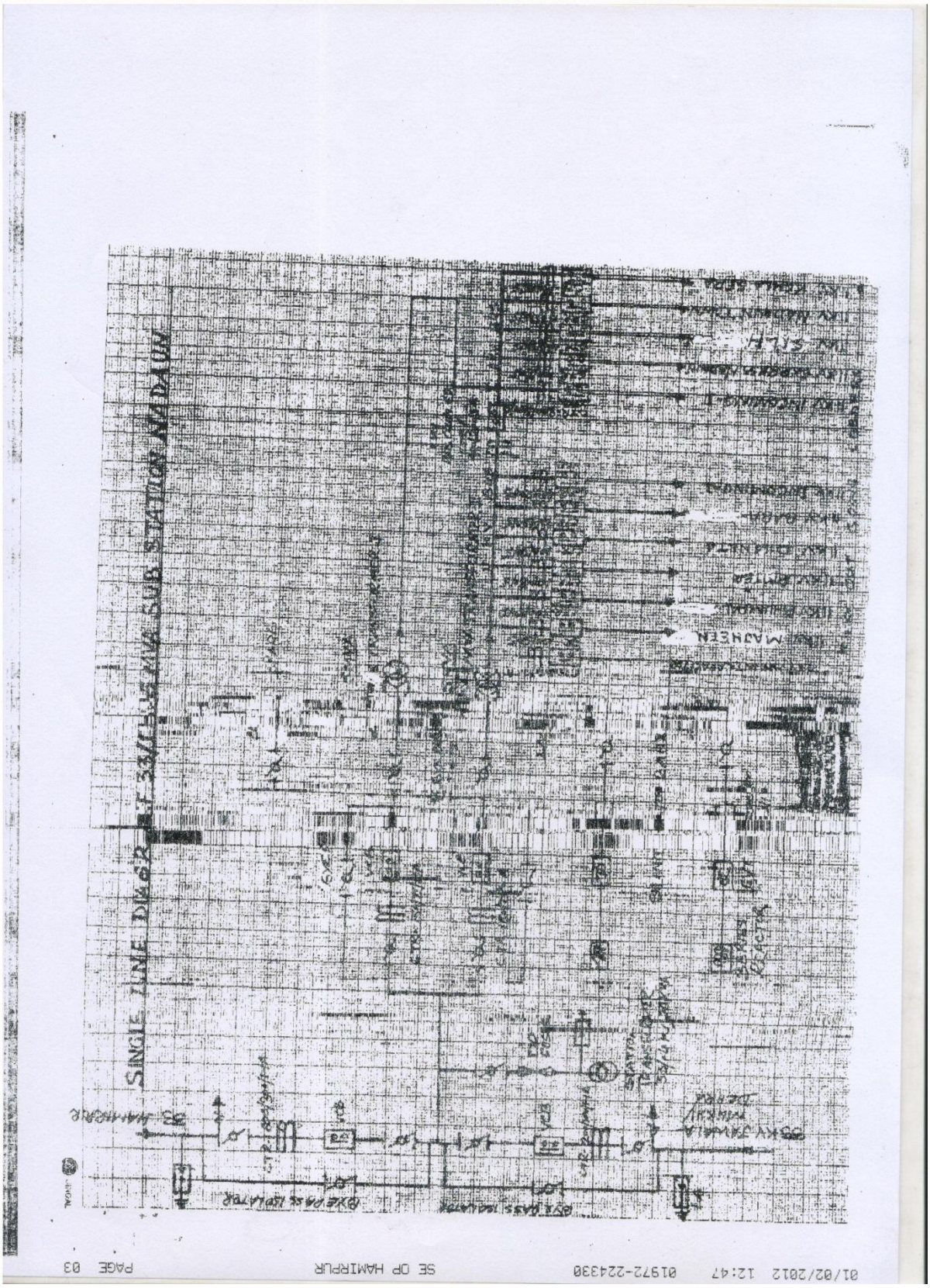
(xv) REDB and VEI for Village electrification need to be commercially handled and effective O&M mechanisms be instituted to prevent deterioration.

(xvi) Distribution Circles concerned in the States should effectively coordinate with REC during preparation of DPRs for RGGVY investments.

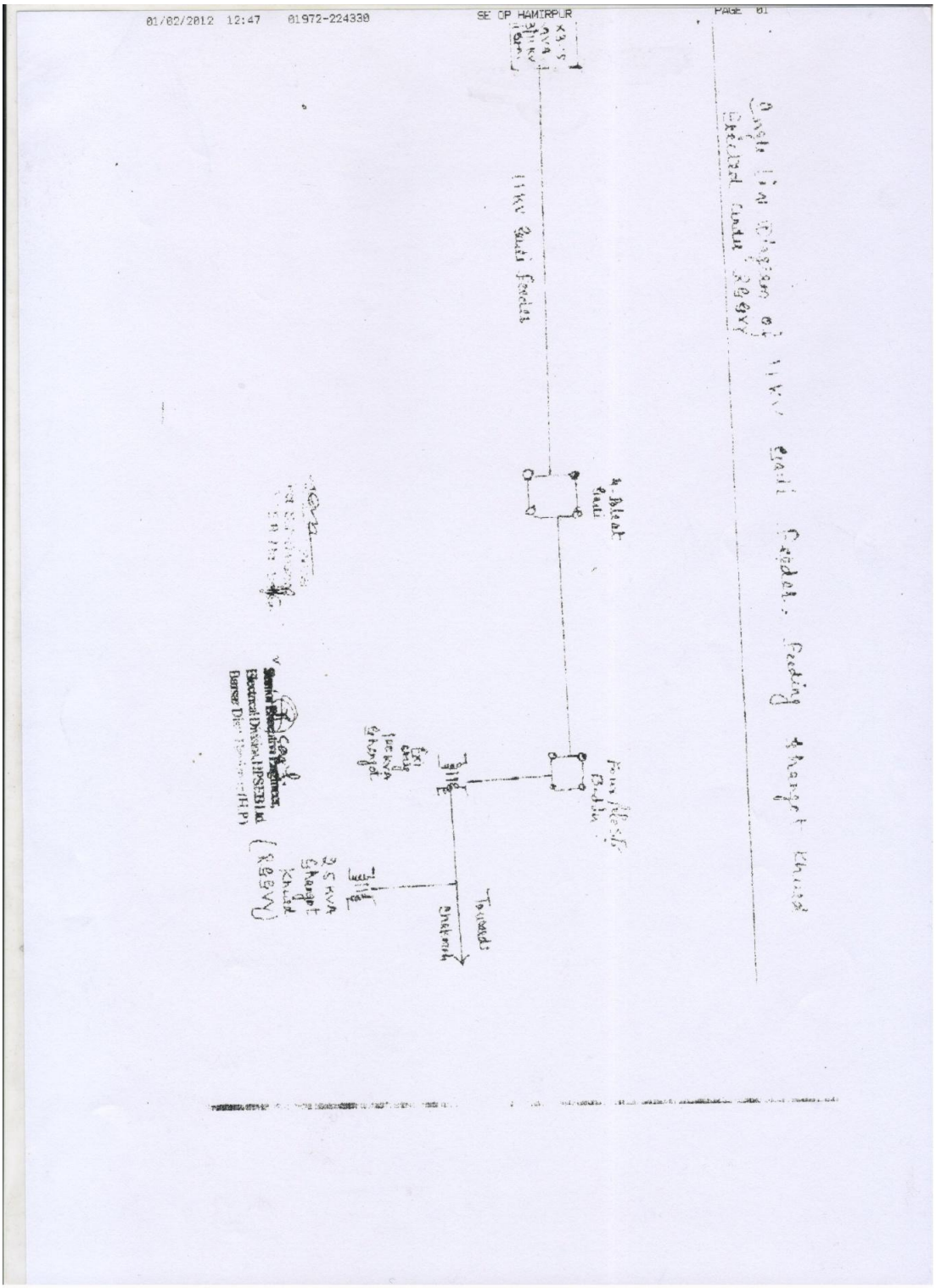
Annexure A: Operation Circle Hamirpur



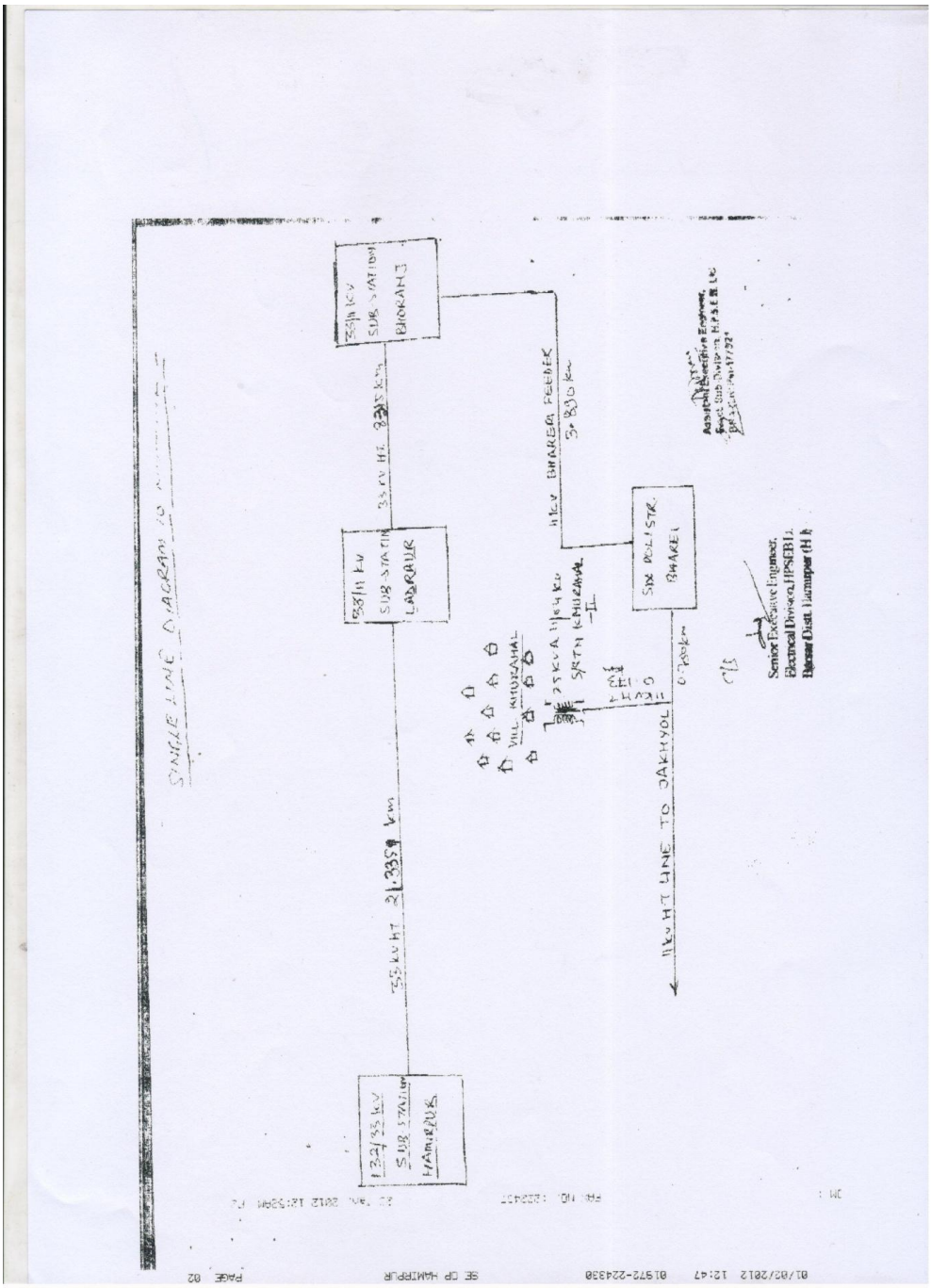
Annexure B: Single Line diagram: 33/ 11 KV 2.5 MVA S/S at Nadaun, Hamirpur



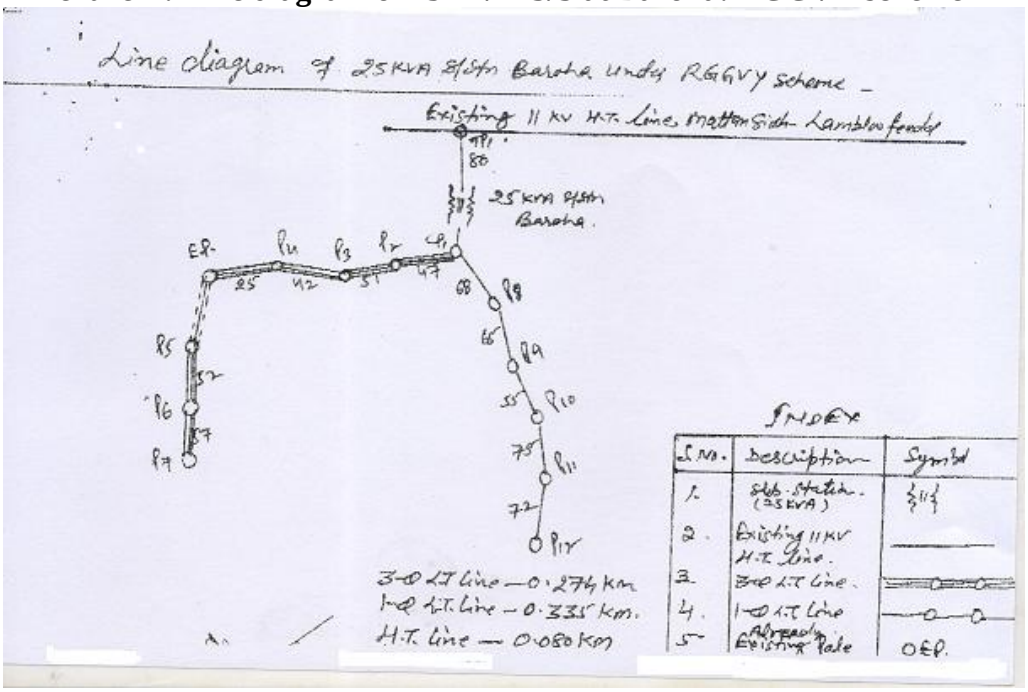
Annexure C: SLD of 11 KV Feeder --Ghangot Khurd electrified under RGGVY (Hamirpur)



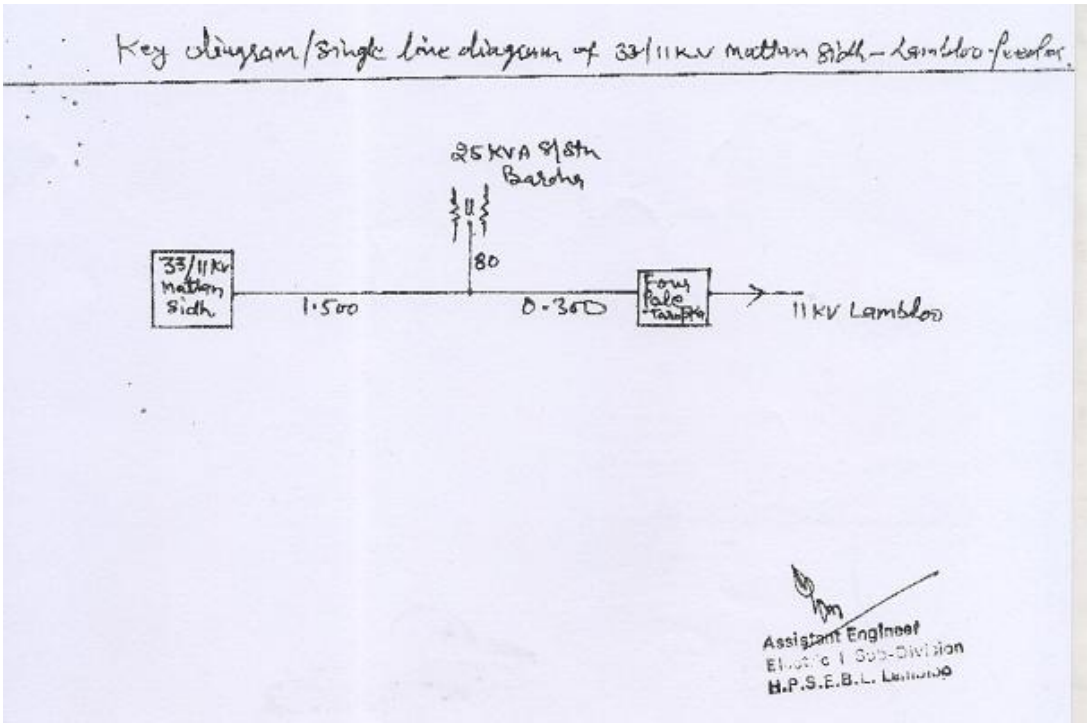
Annexure D: SLD of 11 KV Feeder -- Khural electrified under RGGVY (Hamirpur)



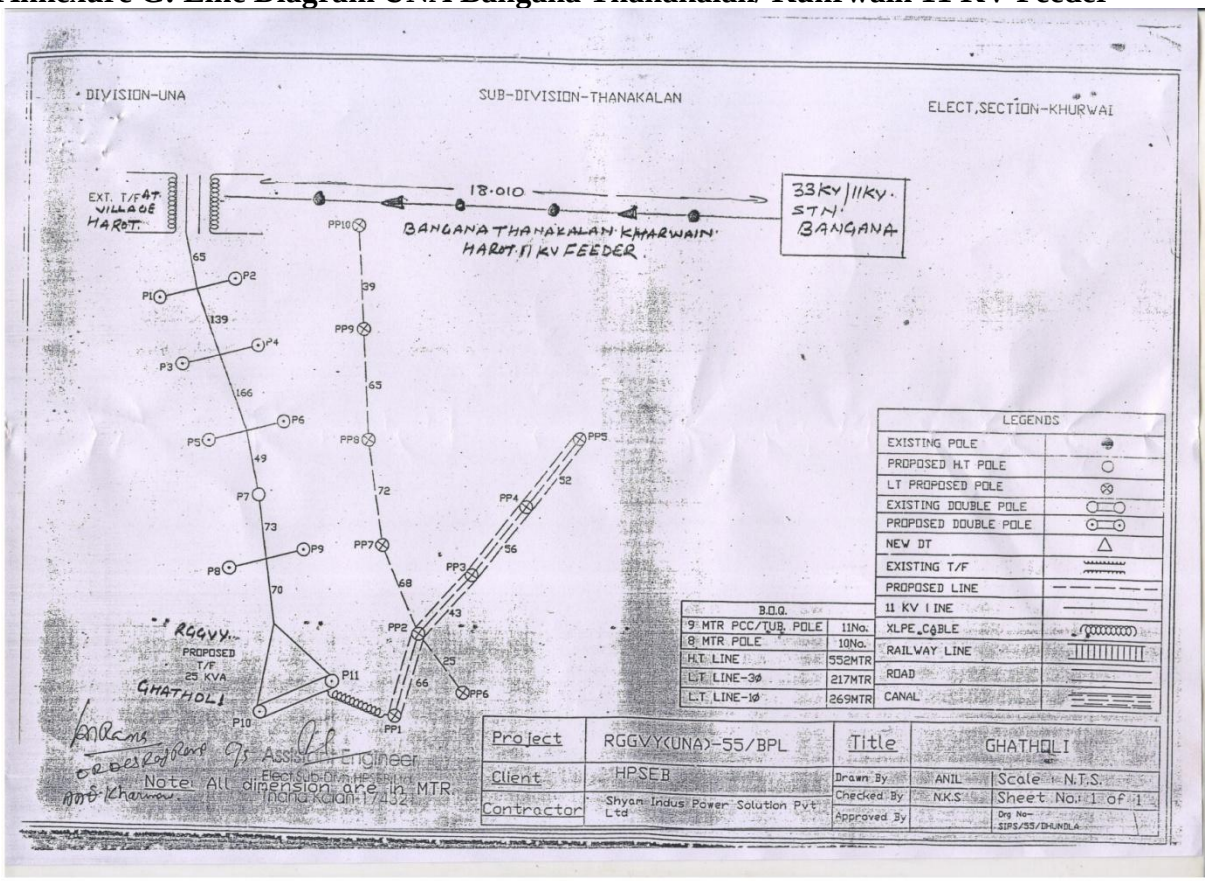
Annexure E: Line diagram of 25 KVA S/S at Baroha: RGGVY scheme



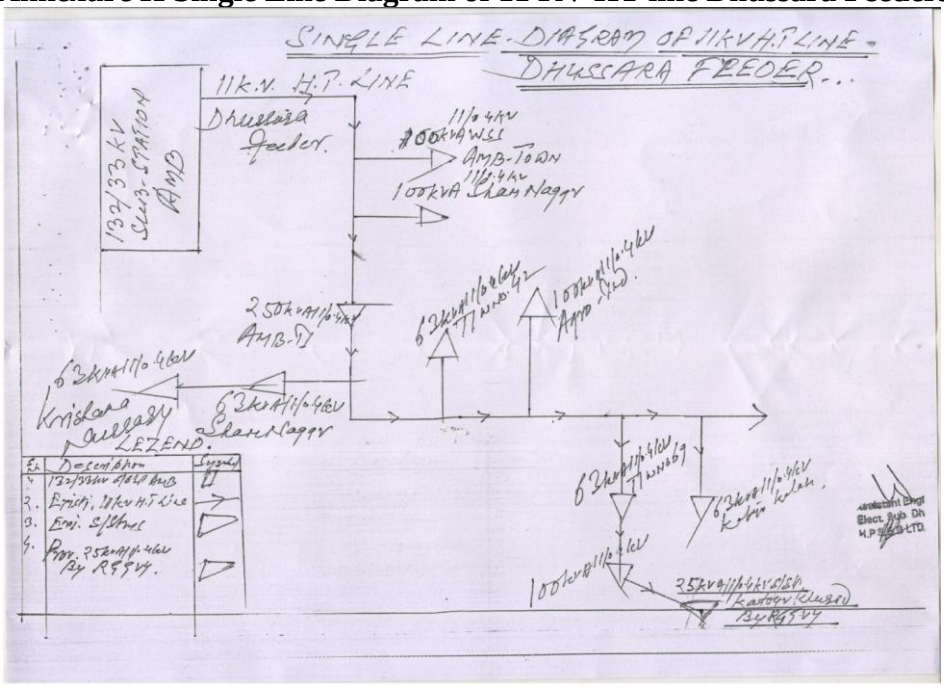
Annexure F: Key /Line diagram of 33/ 11 KV Mattan Sidh – Lambloo Feeder (Hamirpur)



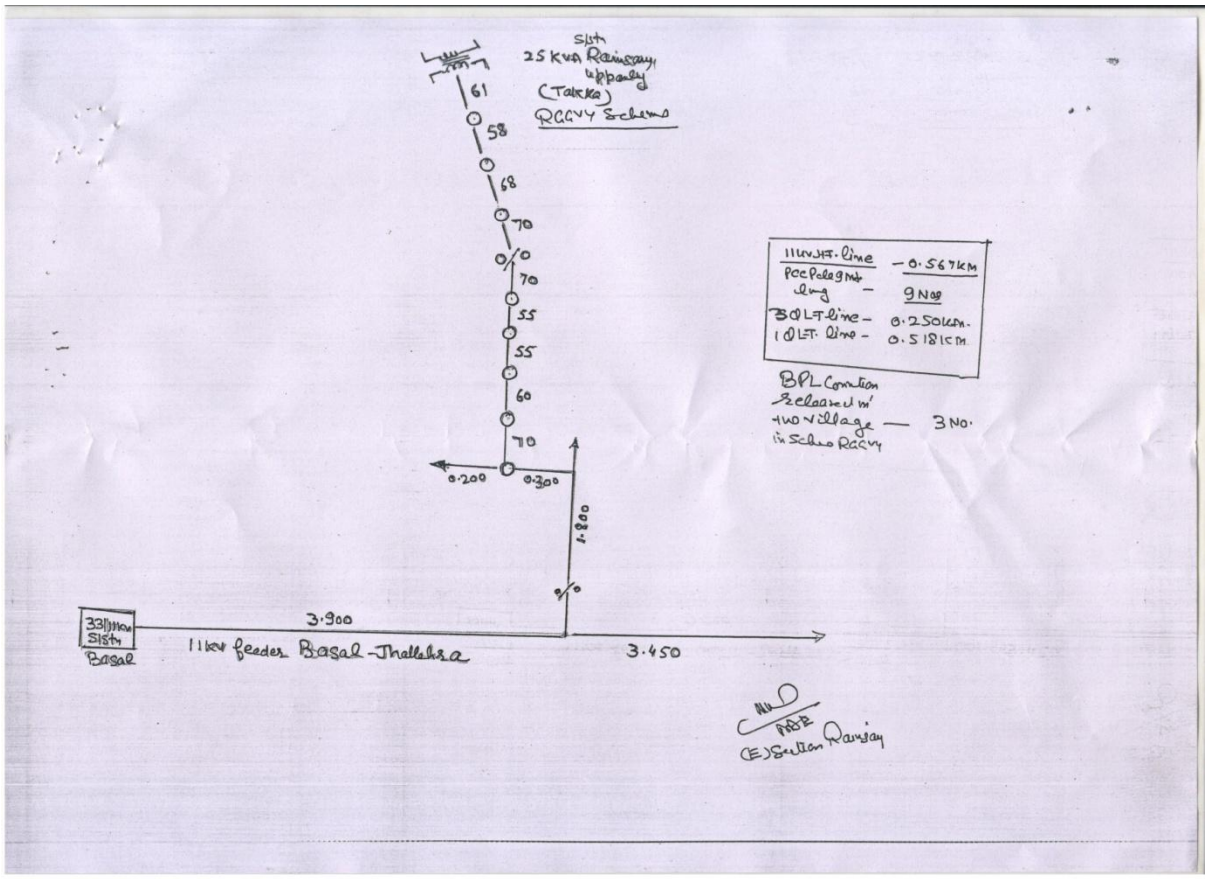
Annexure G: Line Diagram UNA Bangana Thanakalan/ Kuhrwain 11 KV Feeder



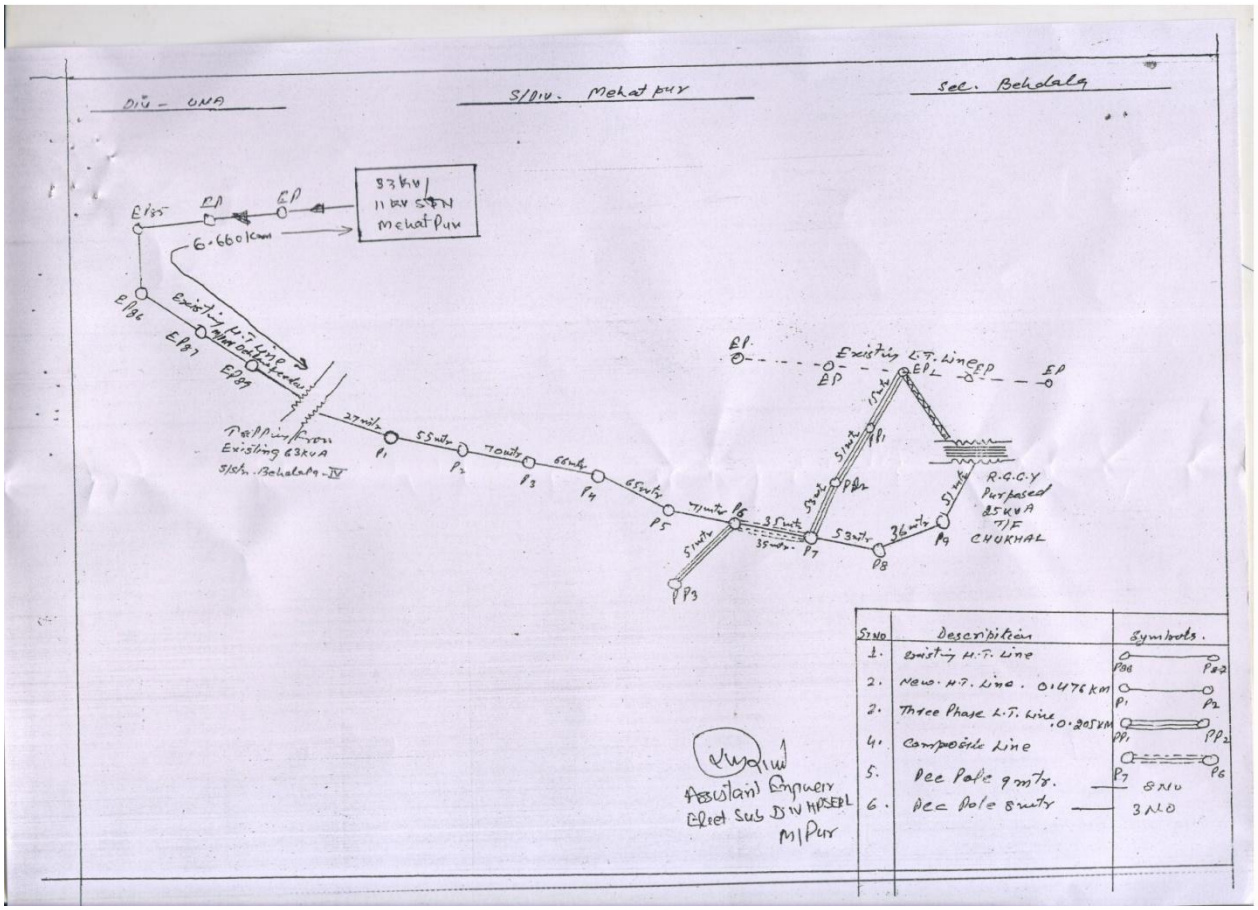
Annexure H Single Line Diagram of 11 KV HT line Dhussara Feeders



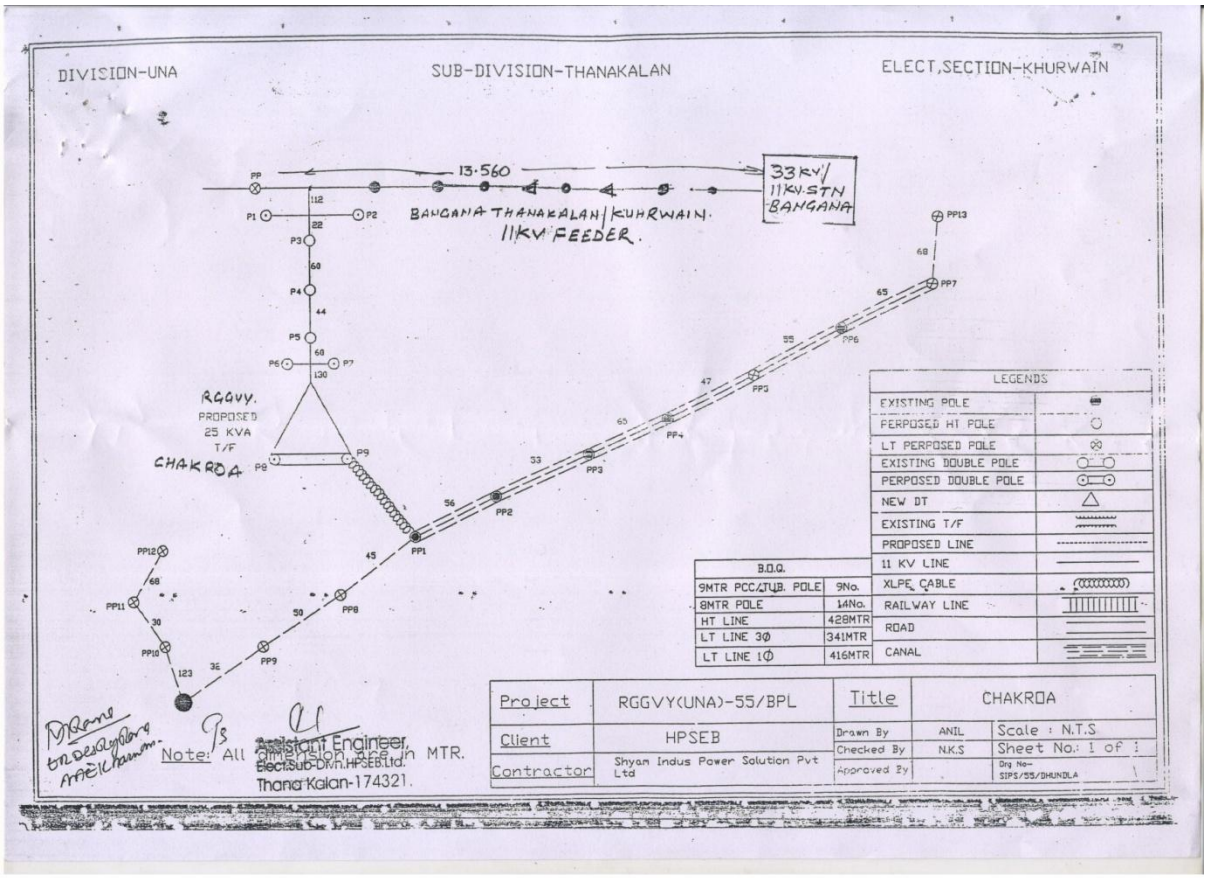
Annexure I Line Diagram Una 11 Kv feeded Basal Jhallehra 25 KVA Substation



Annexure J Line Diagram Una; Substation Mehatpur (33/ 11 KV)



Annexure K: Subdivision Thanakalan



Additional Data

Sl. No.	State/Discom	2007-08		2008-09		2009-10	
		Agricultural		Agricultural		Agricultural	
		Revenue		Revenue		Revenue	
		Rs. Crores	Rs./Kwh	Rs. Crores	Rs./Kwh	Rs. Crores	Rs./Kwh
2	Himachal Pradesh						
	HPSEB	17	6.39	16	5.55	19	5.3

Electricity Demand Projection[1]

	Electrical Energy Requirement (GWh)			Peak Electrical Load (MW)		
States	2011-12	2016-17	2021-22	2011-12	2016-17	2021-22
Himachal Pradesh	9504	13136	17657	1611	2194	2907
Total all India	968659	1392066	1914508	152746	218209	298253

[1] http://www.scribd.com/doc/57505120/17th-Electric-Power-Survey-Report (Central Electricity Authority Report)

Actual Power Supply Position of States								(MU)
States	Apr 10-Jan. 11				April 09-March 10			
	Requirement	Availability	Deficit	( )	Requirement	Availability	Deficit	( )
Himachal Pradesh	7626	7364	-262	-3.4	7047	6769	-278	-3.9

Data Compiled from the State

Whether Electrification done as per DPR														
S.No.	State	Name of State/District	Name of Block	Name of Village	Category (UE/PE)	Quantity as per DPR				Quantity as per present survey				33/11 KVA Substation in the Block
						DTs (In Nos.)	DT capacity	HT (in Ckt. Km.)	LT (in Ckt. Km.)	DTs (In Nos.)	DT capacity KVA (each)	HT (in Ckt. Km.)	LT (in Ckt. Km.)	
51	Himachal	CHAMBA	Pangi	HUNDAN BHATORI (18) (00001300)	UE	1	25	2.1	7.8	1	25KVA	33 KV HT Line 16 ckt Km (25.% completed) 11 KV HT Line 22.91 ckt KM (64% completed) LT Line 33.43 Ckt Km (33% completed)		Killar(P/H)(Not energizrd)
52	Himachal			MICHAM (53) (00005700)	UE	1	25	2.7	4.7	1	25KVA			Sach Gharat(P/H)
53	Himachal			MOJHI (73) (00009500)	UE	1	16	1.8	2.6	1	16KVA			Sach Gharat(P/H)
54	Himachal			SAICHU (65) (00009800)	UE	1	25	1.8	12.8	1	25KVA			Sach Gharat(P/H)
55	Himachal			SURAL BHATORI (16) (00001100)	UE	1	25	2.4	5.86	1	25KVA			Sural(P/H)(Not energizrd)
56	Himachal	LAHUL & SPITI	Spiti	DUPHUK (177/2) (00596800)	UE				3			11 KV Single phase line		

57	Himachal			LAPCHA (174/2) (00596400)	UE				3			with ACSR 6/1/2.11 mm on steel poles. 1.33 cKm 22 KV Lines with ACSR-6/1/3.35mm on steel Poles 20.5 cKm 3-Phase 5 Wire with ACSR 6/1/2.11 on Steel Poles 5.51 cKm 1-Phase 2 Wire with ACSR 6/1/2.11 on steel poles 22.926 cKm		
58	Himachal			MULCHE (155/3) (00593200)	UE				5.2				
59	Himachal			PINJOOR (61/2) (00581500)	UE	1	16	1.5	0.6		25		
60	Himachal			TARBOLE (151/3) (00592500)	UE				4.7				
61	Himachal	MANDI	Karsog	GALIOG(86) (00884700)	IE				0.4		25 (at Galiog)		33/22KVA Pangoana X--------X 25KVA

													Galiog
62	Himachal		Mandi Sadar	D.P.F. KHOTI (455) (00762500)	UE Special Case)			0	0				
63	Himachal		Rewalsar	GHARBASRA (165) (00776400)	IE			0	0				
64	Himachal		Seraj	DPF CHHATRI (416) (00843500)	UE Special Case)						100KVA (at Chhatri –II)		66/22KVA KumarsainX---------- 100KVA,Chhatri-II X----------63KVA Magrugalu
65	Himachal			PATAK (421) (00840600)	IE				0.5		63 KVA at Magrugalu		
66	Himachal	UNA	Amb	BATUHI(439) (01184200)	IE (Kuthar Khurd)			0	0				
67	Himachal		Amb	Kataur Khurd		1	25	0.85	1.4		25 KVA		Amb
68	Himachal		Dhundla	CHAKROA (6/13) (01163300)	IE	1	25	0.5	0.6		25 KVA		bangana
69	Himachal			GHARTHOLI (01161600)	IE	1	25	1.5	0.6		25 KVA		bangana
70	Himachal		Una	CHAUKHYAL	IE	1	25	0.5	1		25 KVA		Mahatpur

				(01191900)										
71	Himachal			RAISARI UPPERLI(192) (01188100)	IE	1	25	0.8	1.1		25 KVA			Basal
72	Himachal	Hamirpur	Bijhar	Gangot Khurad (1061800)	IE	1	25	0.74	0.96		25 KVA	1.238	0.48	2*3.15 MVA Barsar
73	Himachal		Bhoranj	Khurral-II (1113000)	IE	2	25 (?)	0.89	0.7		25 KVA	0.175	0.05	2*3.15 MVA Bhoranj
74	Himachal		Nadaun	Pukhrani (984100)	IE (special)						25 KVA	0.735	0.36	2*5 MVA Nadaun
75	Himachal			Sasan Brahmna (987500)	IE	1	25	0.77	0.88		25 KVA	0	0	2*1.60 MVA Rangaus
76	Himachal		Sujanpur	Broha (1040300)	IE (special)						25 KVA	0.08	0.27	132 KV Substation at M/Sidh
Himachal	**Total**													

Whether Electrification done as per DPR

S.No.		Name of State/District	Name of Block	Name of Village	Category (UE/PE)	Nos. of HHs in a Village at the time of present survey	Nos. of HHs covered under RGGVY (as per DPR)	Nos. of HHs actully electrified at the time of present survey	Reasons for difference/ gap	Nos. of HHs energised

	State					No. of BPLs	No. of APLs	Total	No. of BPLs	No. of APLs	Total	No. of BPLs	Other BPL	No. of APLs	Total		No. of BPLs	No. of APLs	Total
51	Himachal	CHAMBA	Pangi	HUNDAN BHATORI (18) (00001300)	UE	45	23	68	20	16	36	0		0	0	Not Energized	0	0	0
52	Himachal			MICHAM (53) (00005700)	UE	10	12	22	10	12	22	5		2	7	Energized Recently	5	2	7
53	Himachal			MOJHI (73) (00009500)	UE	8	9	17	8	4	12	7		4	11	Energized Recently	7	4	11
54	Himachal			SAICHU (65) (00009800)	UE	32	24	59	30	29	59	32		9	41	Energized Recently	32	9	41
55	Himachal			SURALBHATORI (16) (00001100)	UE	30	35	65	15	12	27	0		0	0	Not Energized	0	0	0
56	Himachal	LAHUL & SPITI	Spiti	DUPHUK (177/2) (0059680	UE	0	0	1	0	1	1	0		0	0	Incomplete project till July 2011	0	0	0

				0)															
57	Himachal			LAPCHA (174/2) (0059640 0)	UE	0	0	1	0	1	1	0		0	0	Incomplete project till July 2011	0	0	0
58	Himachal			MULCHE (155/3) (0059320 0)	UE	0	0	1	0	1	1	0		0	0	Incomplete project till July 2011	0	0	0
59	Himachal			PINJOOR (61/2) (0058150 0)	UE	0	0	9	0	9	9	0		0	0	Incomplete project till July 2011	0	0	0
60	Himachal			TARBOLE (151/3) (0059250 0)	UE	0	0	2	0	2	2	0		0	0	Incomplete project till July 2011	0	0	0
61	Himachal	MANDI	Karsog	GALIOG (86) (0088470 0)	IE	10		10	0	3	3	10		2	12		10	2	12
62	Himachal		Mandi Sadar	D.P.F. KHOTI (455) (0076250 0)	UE Special Case)	2		2	0	3	3	2			2		2		2

63	Himachal		Rewalsar	GHARBASRA (165) (0077640 0)	IE				0	6	6	3		1	4				0
64	Himachal		Seraj	DPF CHHATRI (416) (0084350 0)	UE Special Case)	1		1		0		1		3	4		1	3	4
65	Himachal			PATAK (421) (0084060 0)	IE	1		1	0	3	3	1		3	4		1	3	4
66	Himachal	UNA	Amb	BATUHI (439) (0118420 0)	IE (Kuthar Khurd)	2	34	36	0	4	4	2		25	27		2	25	27
67	Himachal		Amb	Kataur Khurd		26	258	284	4	0	4	26		0	26		26	258	284
68	Himachal		Dhundla	CHAKROA (6/13) (0116330 0)	IE	10	29	39	1	4	5	10		0	10		10	0	10
69	Himachal			GHARTHOLI (0116160 0)	IE	3	20	23	1	3	4	3		0	3		3	0	3

70	Himachal		Una	CHAUKHYAL (0119190)	IE	4	26	30	0	12	12	4		0	4		4	0	4
71	Himachal			RAISARI UPPERLI(192) (0118810)	IE	72	418	490	0	9	9	72		43	115		72	43	115
72	Himachal	Hamirpur	Bijhar	Gangot Khurad (1061800)	IE	2	25	27	0	0	0	2		0	2		2	0	2
73	Himachal		Bhoranj	Khurral-II (1113000)	IE	2	37	39	0	0	0	1		0	1		1	0	1
74	Himachal		Nadaun	Pukhrani (984100)	IE (special)	11	39	50	0	0	0	11		0	11		11	0	11
75	Himachal			Sasan Brahmna (987500)	IE	11	43	54	0	0	0	4		2	6		4	2	6
76	Himachal		Sujanpur	Broha (1040300)	IE (special)	1	59	60	0	0	0	1		59	60		1	59	60
Himachal	**Total**					**283**	**1091**	**1391**	**89**	**134**	**223**	**197**	**0**	**153**	**350**	**0**	**194**	**410**	**604**

Electrificaiton of Public Places										
S.No.	**Name of State/District**	**Name of Block**	**Name of Village**	**Category (UE/PE)**	**No. of Public places in Village at the time of present survey**				**No. public places having electricity before RGGVY**	**No. public places having electricity after RGGVY**
					School	**Health Center**	**Community Center**	**Total**		
1	CHAMBA	Pangi	HUNDAN BHATORI (18) (00001300)		1			1		0
			MICHAM (53) (00005700)		1			1		1
			MOJHI (73) (00009500)		1			1		1
			SAICHU (65) (00009800)		1			1		1

			SURAL BHATORI (16) (00001100)		1			1		0
2	LAHUL & SPITI	Spiti	DUPHUK (177/2) (00596800)		0			0		0
			LAPCHA (174/2) (00596400)		0			0		0
			MULCHE (155/3) (00593200)		0			0		0
			PINJOOR (61/2) (00581500)		1			1		0
			TARBOLE (151/3) (00592500)		0			0		0
3	MANDI	Karsog	GALIOG(86) (00884700)		1	0		1		1

		Mandi Sadar	D.P.F. KHOTI (455) (00762500)		0	0		0		0
		Rewalsar	GHARBASRA (165) (00776400)		1	0		1		1
		Seraj	DPF CHHATRI (416) (00843500)		0	0		0		0
			PATAK (421) (00840600)		1	0		1		1
4	UNA	Amb	BATUHI(439) (01184200)					0		0
		Amb	Kataur Khurd		1	1		2		2
		Dhundla	CHAKROA (6/13) (01163300)		0	0		0		0
			GHARTHOLI (01161600)		1	0		1		1

		Una	CHAUKHYAL (01191900)		1	0		1		1
			RAISARI UPPERLI(192) (01188100)		1	1		2		2
5	Hamirpur	Bijhar	Gangot Khurad (1061800)		1	0		1		1
		Bhoranj	Khurral-II (1113000)		1	0		1		1
		Nadaun	Pukhrani (984100)		0	0		0		0
			Sasan Brahmna (987500)		1	0		1		1
		Sujanpur	Broha (1040300)		0	0		0		0

Adequacy of completion schedule, causes of delays										
S.No.		**Name of**	**Name of**	**Name of**	**Award**	**Date of**	**Scheduled**	**Actual**	**Delay**	**Reasons**

	State	District / DPR Sanction date	Block	Village	Based on Substation	Award/ DPR Sanction Date	Completion time (in mths)	Completion Time (in mths)	(in Mths)	for Delay
51	Himachal	CHAMBA 02-12-2005	Pangi	HUNDAN BHATORI (18) (00001300)		02-12-2005				Not Energized
52	Himachal			MICHAM (53) (00005700)		02-12-2005		11-09-2011	69	
53	Himachal			MOJHI (73) (00009500)		02-12-2005		06-11-2011	71	
54	Himachal			SAICHU (65) (00009800)		02-12-2005		11-09-2011	69	
55	Himachal			SURAL BHATORI (16) (00001100)		02-12-2005				Not Energized
56	Himachal	LAHUL & SPITI 01-09-2008	Spiti	DUPHUK (177/2) (00596800)		14-03-2007		31-03-2012	61	
57	Himachal			LAPCHA (174/2) (00596400)		14-03-2007		31-03-2012	61	
58	Himachal			MULCHE (155/3) (00593200)		14-03-2007		31-03-2012	61	
59	Himachal			PINJOOR (61/2) (00581500)		14-03-2007		31-03-2012	61	

60	Himachal			TARBOLE (151/3) (00592500)		14-03-2007		31-03-2012	61	
61	Himachal	MANDI 08-04-2008	Karsog	GALIOG(86) (00884700)		08-04-2008		23-03-2011	35	
62	Himachal		Mandi Sadar	D.P.F. KHOTI (455) (00762500)		08-04-2008				
63	Himachal		Rewalsar	GHARBASRA (165) (00776400)		08-04-2008				
64	Himachal		Seraj	DPF CHHATRI (416) (00843500)		08-04-2008		15-06-2011	38	
65	Himachal			PATAK (421) (00840600)		08-04-2008		20-11-2010	31	
66	Himachal	UNA 05-03-2008	Amb	BATUHI(439) (01184200)		05-03-2008				
67	Himachal		Amb	Kataur Khurd		05-03-2008		Jan-12	46	
68	Himachal		Dhundla	CHAKROA (6/13) (01163300)		05-03-2008		Jan-12	46	
69	Himachal			GHARTHOLI (01161600)		05-03-2008		Jan-12	46	
70	Himachal		Una	CHAUKHYAL (01191900)		05-03-2008				
71	Himachal			RAISARI UPPERLI(192) (01188100)		05-03-2008		Dec-11	45	

72	Himachal	Hamirpur 28-03-2008	Bijhar	Gangot Khurad (1061800)		28-03-2008		Aug-10	28	
73	Himachal		Bhoranj	Khurral-II (1113000)		28-03-2008		Sep-11	41	
74	Himachal		Nadaun	Pukhrani (984100)		28-03-2008		Jul-11	39	
75	Himachal			Sasan Brahmna (987500)		28-03-2008		Jun-11	38	
76	Himachal		Sujanpur	Broha (1040300)		28-03-2008		Oct-10	30	
Himachal	**Total**									

S.No.	State	Name of State/District	Name of Block	Name of Village	Hours of Supply	Quality of Supply
51	Himachal	CHAMBA	Pangi	HUNDAN BHATORI (18) (00001300)		
52	Himachal			MICHAM (53) (00005700)	18-24 Hrs	Good
53	Himachal			MOJHI (73) (00009500)	18-24 Hrs	Voltage Drop
54	Himachal			SAICHU (65) (00009800)	18-24 Hrs	Good
55	Himachal			SURAL BHATORI (16) (00001100)		
56	Himachal	LAHUL & SPITI	Spiti	DUPHUK (177/2) (00596800)		
57	Himachal			LAPCHA (174/2) (00596400)		
58	Himachal			MULCHE (155/3) (00593200)		
59	Himachal			PINJOOR (61/2) (00581500)		
60	Himachal			TARBOLE (151/3) (00592500)		
61	Himachal	MANDI	Karsog	GALIOG(86) (00884700)	18-24 Hrs	Good
62	Himachal		Mandi Sadar	D.P.F. KHOTI (455) (00762500)	18-24 Hrs	Voltage Drop
63	Himachal		Rewalsar	GHARBASRA (165) (00776400)	18-24 Hrs	Good
64	Himachal		Seraj	DPF CHHATRI (416) (00843500)	18-24 Hrs	Voltage Drop

65	Himachal			PATAK (421) (00840600)	18-24 Hrs	
66	Himachal	UNA	Amb	BATUHI(439) (01184200)	18-24 Hrs	
67	Himachal		Amb	Kataur Khurd	18-24 Hrs	
68	Himachal		Dhundla	CHAKROA (6/13) (01163300)	18-24 Hrs	
69	Himachal			GHARTHOLI (01161600)	18-24 Hrs	
70	Himachal		Una	CHAUKHYAL (01191900)	18-24 Hrs	
71	Himachal			RAISARI UPPERLI(192) (01188100)	18-24 Hrs	
72	Himachal	Hamirpur	Bijhar	Gangot Khurad (1061800)	18-24 Hrs	
73	Himachal		Bhoranj	Khurral-II (1113000)	18-24 Hrs	
74	Himachal		Nadaun	Pukhrani (984100)	18-24 Hrs	
75	Himachal			Sasan Brahmna (987500)	18-24 Hrs	
76	Himachal		Sujanpur	Broha (1040300)	18-24 Hrs	
Himachal	**Total**					

Electricity Demand Projection						
	Electrical Energy Requirement (GWh)			Peak Electrical Load (MW)		
States	2011-12	2016-17	2021-22	2011-12	2016-17	2021-22
Himachal Pradesh	9504	13136	17657	1611	2194	2907
Total all India	968659	1392066	1914508	152746	218209	298253

S.No.	State	Name of State/District	Name of Block	Name of Village	Category (UE/PE)	RH H	No. of APL HHs at the time of Survey	APL connections before RGGVY	APL connections after RGGVY	APL HHs not applied for connection	APL HHs applied for connection but not released
51	Himachal	CHAMBA	Pangi	HUNDAN BHATORI (18) (00001300)	UE		23	0	0		
52	Himachal			MICHAM (53) (00005700)	UE		12	0	2		
53	Himachal			MOJHI (73) (00009500)	UE		9	0	4		
54	Himachal			SAICHU (65) (00009800)	UE		24	0	9		
55	Himachal			SURAL BHATORI (16) (00001100)	UE		35	0	0		
56	Himachal	LAHUL & SPITI	Spiti	DUPHUK (177/2) (00596800)	UE		0	0	0		
57	Himachal			LAPCHA (174/2) (00596400)	UE		0	0	0		

58	Himachal			MULCHE (155/3) (00593200)	UE		0	0	0		
59	Himachal			PINJOOR (61/2) (00581500)	UE		0	0	0		
60	Himachal			TARBOLE (151/3) (00592500)	UE		0	0	0		
61	Himachal	MANDI	Karsog	GALIOG(86) (00884700)	IE			0	2		
62	Himachal		Mandi Sadar	D.P.F. KHOTI (455) (00762500)	UE Special Case)			0			
63	Himachal		Rewalsar	GHARBASRA (165) (00776400)	IE			0			
64	Himachal		Seraj	DPF CHHATRI (416) (00843500)	UE Special Case)			0	3		
65	Himachal			PATAK (421) (00840600)	IE			0	3		
66	Himachal	UNA	Amb	BATUHI(439) (01184200)			34	0	25		
67	Himachal		Amb	Kataur Khurd			258/260 (1092)	258	2		2

68	Himachal		Dhundla	CHAKROA (6/13) (01163300)	IE		29/30 (137)	29	1		
69	Himachal			GHARTHOLI (01161600)	IE		30 (135)	0	0		
70	Himachal		Una	CHAUKHYAL (01191900)	IE		26/34 (146)	31	3		
71	Himachal			RAISARI UPPERLI(192) (01188100)	IE		418 (1667)	375	43		
72	Himachal	Hamirpur	Bijhar	Gangot Khurad (1061800)	IE		25	0	0		
73	Himachal		Bhoranj	Khurral-II (1113000)	IE		37	0	0		
74	Himachal		Nadaun	Pukhrani (984100)	IE (special)		39	0	0		
75	Himachal			Sasan Brahmna (987500)	IE		43	0	2		
76	Himachal		Sujanpur	Broha (1040300)	IE (special)		59	0	59		
Himachal	**Total**							0			

Billing to and payment by BPL and APL consumer

S.No.	State	Name of State/District	Name of Block	Name of Village	Time taken in release of first Bill in Month	Average Amt. of first Bill	Periodicity of Subsequent Bills	Energy Billed in Units	Average Amount every two months	Reason for Delay	Bills paid on time	Delay in Bill Payment (in mths)	Reason for Delay
51	Himachal	CHAMBA	Pangi	HUNDAN BHATORI (18) (00001300)									
52	Himachal			MICHAM (53) (00005700)									
53	Himachal			MOJHI (73) (00009500)									
54	Himachal			SAICHU (65) (00009800)									
55	Himachal			SURAL BHATORI (16) (00001100)									

56	Himachal	LAHUL & SPITI	Spiti	DUPHUK (177/2) (00596800)									
57	Himachal			LAPCHA (174/2) (00596400)									
58	Himachal			MULCHE (155/3) (00593200)									
59	Himachal			PINJOOR (61/2) (00581500)									
60	Himachal			TARBOLE (151/3) (00592500)									
61	Himachal	MANDI	Karsog	GALIOG(86) (00884700)				1330 KWh					
62	Himachal		Mandi Sadar	D.P.F. KHOTI (455) (00762500)									
63	Himachal		Rewalsar	GHARBASRA (165) (00776400)									
64	Himachal		Seraj	DPF CHHATRI (416) (00843500)				320 KWh					
65	Himachal			PATAK (421)									

				(00840600)									
66	Himachal	UNA	Amb	BATUHI(439) (01184200)									
67	Himachal		Amb	Kataur Khurd				15234 units					
68	Himachal		Dhundla	CHAKROA (6/13) (01163300)				3520 units				Bi-monthly	
69	Himachal			GHARTHOLI (01161600)									Billing will start from 05/2012 due new installation of DT
70	Himachal		Una	CHAUKHYAL (01191900)				3410 units					
71	Himachal			RAISARI UPPERLI(192) (01188100)				60528 units					
72	Himachal	Hamirpur	Bijhar	Gangot Khurad (1061800)				3250					
73	Himachal		Bhoranj	Khurral-II (1113000)				5340					

74	Himachal		Nadaun	Pukhrani (984100)				8700					
75	Himachal			Sasan Brahmna (987500)				8000					
76	Himachal		Sujanpur	Broha (1040300)									
Himachal	**Total**												

		Commercial loss w/o subsidy		Subsidy		cost of Supply		Average Tariff		AT & C Losses		Agriculture consumption		Agri. Tariff	
		2008-09 (Prov)	2009-10 RE	2008-09 (Prov)	2009-10 RE	2008-09 (Prov)	2009-10 RE	2008-09 (Prov)	2009-10 RE	2008-09 (Prov)	2009-10 RE	2008-09 (Prov)	2009-10 RE	2008-09 (Prov)	2009-10 RE
3	Himachal Pradesh	43.11	127.06	0	0	421.59	407.06	405.98	381.99	19.55	18.24	0.41	0.4	5.56	3.68

Actual Power Supply Position of States								**(MU)**
States	**Apr 10-Jan. 11**				**April 09-March 10**			
	Requirement	**Availability**	**Deficit**	**( )**	**Requirement**	**Availability**	**Deficit**	**( )**

Himachal Pradesh	7626	7364	-262	-3.4	7047	6769	-278	-3.9

3. PHOTOS FROM THE SURVEY

Figure 1 Last Mile Household is being Surveyed by IRADe- Remote villages/households has been electrified, bringing access to power

Figure 2 Transformer installed in the Village under RGGVY

Figure 3 School Electrified under RGGVY

Figure 4 A Below Poverty Household has been Electrified

Figure 5 Electricity Access and Availability is helping in ensuring communication and Connectivity at the Last Mile Household

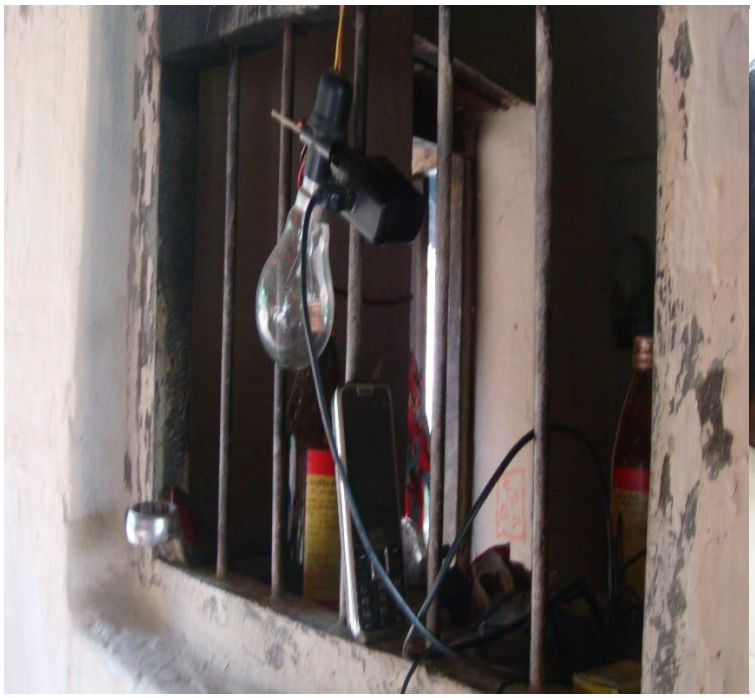


Figure 6 IRADe team carrying out Door to Door Household Survey

Figure 7 IRADe team Gathering direct Feedback from the beneficiaries

Figure 8 The connection arm is installed on Ground due to unavailability of proper mounting Structure-Practical Challenges being faced

Figure 9 IRADe Project Member is Verifying the RGGVY Name Plate in one of the village surveyed in the Mandi District in Himachal

Figure 10 Properly sealed meters

Figure 11 Group photo after a focused group discussion in one of the villages in Mandi district of Himachal Pradesh

Figure 12 Group Photo after focused group discussion

Figure 13 IRADe Team Member is a surveying a village which faces a low voltage problem and interacting with the Official from HPSEB on the issue.

Figure 14 Women are being surveyed to assess the impact of RGGVY on women empowerment in Rajasthan

Figure 15 A focused group discussion is being carried out by the IRADe team in one of the villages in the Bharatpur district of Rajasthan

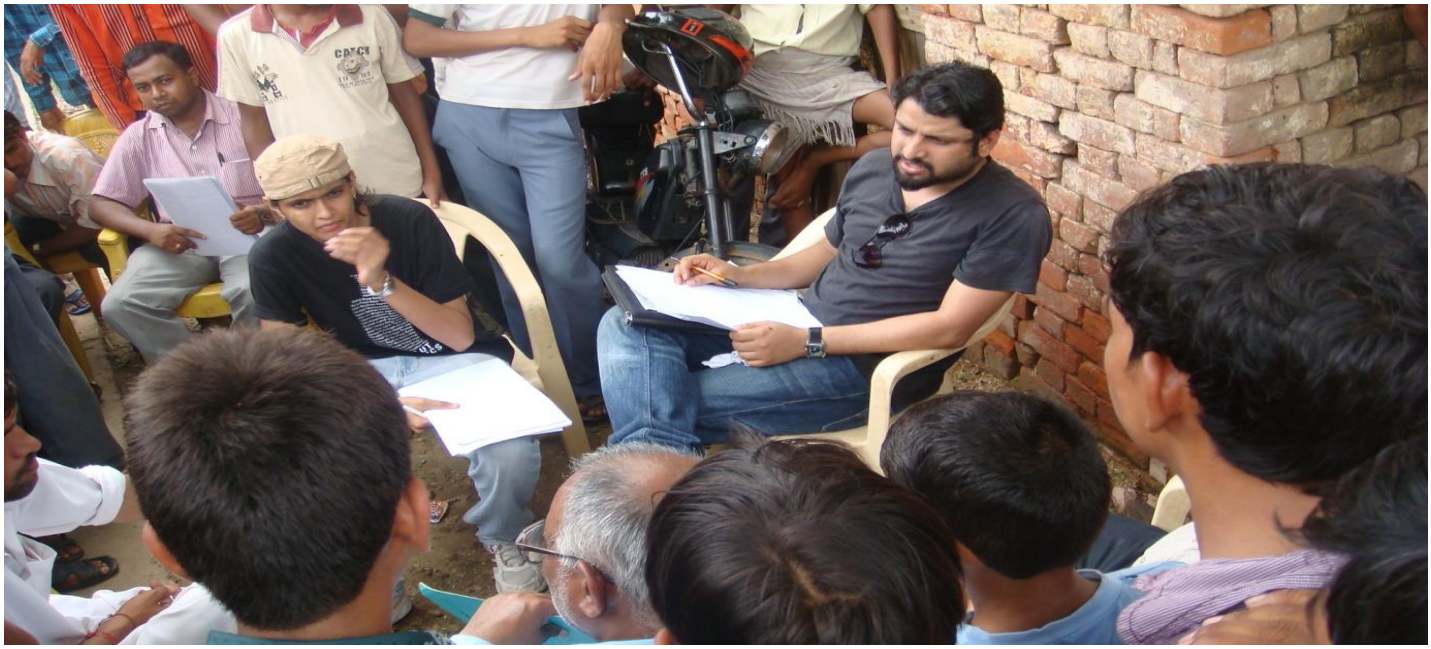


Figure 16 Figure 14 IRADe team is Interacting with the Official from HPSEB

Figure 17 RGGVY has helped in opening small business activities such as small Tea cum kiran Shops which are now being run during evening hours due to the access and availability electricity in Himachal Pradesh

Figure 18 One of surveyed villages, Transformer needs Proper maintenance

Figure 19 IRADe Team Interacting with Senior Officials of DISCOMs

Figure 20 Some of the villages the supply of electricity is very irregular, therefore to know whether electricity is available or not villagers put an electric bulb along the main supply line to check the supply status.

Figure 21 Door to Door Household survey is being carried out by the IRADe Team.

Figure 22 Meter Condition is being checked by the IRADe team member

Figure 23 Household Meter, Meter Reading and Electricity Bills are being Cross Checked and Verified to ascertain current status of the Electricity Connections







Figure 24 IRADE team Interacting with the Household, Children and Women about the Benefits of electricity Connection

Figure 25 BPL household has been Electrified