



Executive Summary

Design and Implementation of DSM-Bidding Pilot Project in Rajasthan



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Executive Summary

The power sector in India has seen significant advancements in the areas of generation and transmission, but further growth is limited by inefficiencies in distribution. Rising costs and constraints on tariff chargeable to consumers have crippled the finances of distribution utilities. Innovative measures to curtail costs while benefitting consumers can be implemented with the help of new technologies and methods such as advanced metering, monitoring and optimisation of load and dynamic power pricing. Demand Response with a Demand Side Bidding mechanism can be one such solution which can be implemented in the short term and provide benefits to utilities as well as consumers in a sustainable manner.

With the objective of establishing a case for demand response and demand side bidding, the consortium of ICF along with IEX and AMP Energy had undertaken the “Design and Implementation of DSM-Bidding Pilot Project in Rajasthan”, implemented over 2013-14. The aim of the project was to set up a mechanism for carrying out Demand Response amongst a set of consumers, showcasing the benefits to the utility as well as the consumers. After studying the consumer profile and preliminary discussions with the energy department of Government of Rajasthan, Jaipur Discom was identified for the pilot study.

During the roll-out of the pilot study, the consortium had engaged with the stakeholders from the Jaipur discom at various levels and stages. Workshops were conducted for discom officials as well as the industrial consumers to explain the concept of demand response and its benefits, as well as their role in the pilot study. The discom accepted the proposed project, assigned the Chief Engineer, Rajasthan Discoms Power Purchase Centre as the Nodal Officer and pledged its support for the pilot. The consortium then installed the necessary hardware and software at consumers’ premises and meters, set up a Network Operating Centre at the utility premises and designed the mechanism for identification of DR events, bidding of potential DR provided, monitoring and evaluation of results and payment of incentive to the consumers for providing DR.

The project succeeded in carrying out four Demand Response events of 1 hour duration each with a set of 17 industrial consumers. Each event saw participation of 10 consumers, providing cumulative DR of 22 MW in each event on average. The table below gives a summary of the key parameters of the DR events and the benefit to the discom:

Event no.	Date	Time (hrs)	No. of participants	MW of DR proposed	MW of DR provided	Impact on discom
1	13-03-2014	1900-2000	10	26.00	21.99	Trial event
2	29-04-2014	1915-2015	10	26.70	22.13	Saving of INR 2,00,017
3	21-05-2014	1700-1800	10	28.40	22.07	Saving of INR 8,894
4	23-05-2014	2200-2300	10	29.00	21.70	Savings of INR 78,478

The implementation of the pilot project presented some unique challenge, though at the same time provided insights into consumer and utility behaviour which were lessons to be learnt for a large scale program implementation. Capacity building, training and creating awareness amongst utility officials as well as consumers was a vital part of the implementation process with DR being a new and advanced market mechanism.

On the utility side, the key challenge was identifying the need for DR and establishing the benefits that it could provide. The utility was also concerned about loss of revenue from reduction in load of the industrial consumers and the benchmarking or capping of incentive payout to the consumers for providing DR. On the consumer side, the challenge was to obtain their willingness for participation in the program. The consumers were sceptical about the benefits they could derive from it and felt it might interfere with their day-to-day core business operations.

Some of the key lessons learnt for implementation of the program on a larger scale included:

- 1) Awareness amongst consumers and utilities about the concept and benefits of DR and DSM-Bidding needs to be spread through various forums, conferences and workshops
- 2) Incentive paid out to consumers needs to be attractive for the consumers and approved by the state regulator
- 3) Role of demand aggregators needs to be defined along with its scope of services a. This would also help in identifying the entities that can play the role of aggregators.
- 4) Capacity building and skill development needs to be carried out amongst state utilities to help the operators identify the DR events and monitor load to optimize the economic benefits for the utility
- 5) Thorough understanding of the consumer's operational processes, energy consumption pattern and power supply scenario needs to be built in order to define the consumer's role in the DR process in a more suitable manner
- 6) Regular meetings and workshops at various stages with the utility officials and the management as well as operational personnel of the consumers need to be held. These are crucial in addressing the concerns and ensuring the participation of all the stakeholders involved throughout the program

The results were presented to the discom officials and were well received and appreciated. The need for a larger utility-scale demand response program was discussed and agreed upon. Rajasthan as well as other states can develop Demand Response programs suited to their requirements and available consumer mix. Utilities would need to define the program framework, obtain regulatory approval for the incentive mechanism and roll-out, engage with demand aggregators and consumers and create awareness for the program in their states through various means. A multi-state framework could then be developed for implementation of a national level Demand Response program, which would go a long way in enabling utilities to manage their peak power demand.