



## *Utility CEO Forum*

ON DEMAND SIDE MANAGEMENT

# Proceedings: 5th Meeting



# Introduction and participant profile

The fifth meeting of the Utility CEO Forum on demand side management (DSM) was held on 11 April 2014, in New Delhi. It sought to discuss and debate cost effectiveness of utility driven DSM programmes through selective case studies and examples. Anil Razdan, Former Secretary, Ministry of Power, chaired the meeting and 24 other participants representing various state electricity distribution companies, electricity regulatory commissions, central nodal agencies and other stakeholders were present.

## Participant profile

<b>Chairman</b>	Anil Razdan, IAS (retired), Former Secretary, Ministry of Power
Electricity Regulatory Commissions (6)	<ol style="list-style-type: none"> <li>1. Rakesh Sahni, Chairman, Madhya Pradesh Electricity Regulatory Commission</li> <li>2. Umesh N Panjiar, Chairman, Bihar Electricity Regulatory Commission</li> <li>3. Pravinbhai Patel, Chairman, Gujarat Electricity Regulatory Commission</li> <li>4. R. N. Prasher, Chairman, Haryana Electricity Regulatory Commission</li> <li>5. M.R.Sreenivasa Murthy, Chairman, Karnataka Electricity Regulatory Commission</li> <li>6. V L Sonavane, Member, Maharashtra Electricity Regulatory Commission</li> <li>7. Rajendra Ambekar, Director, Maharashtra Electricity Regulatory Commission</li> </ol>
Utilities (8)	<ol style="list-style-type: none"> <li>8. Pramod Deo, Additional VP, DSM and EE, Reliance Infrastructure Limited</li> <li>9. Anup Mondal, Senior Executive VP, Business Development, Reliance Infrastructure Limited</li> <li>10. Ganesh Das, Head of Group, Strategy, Tata Power Delhi Distribution Limited</li> <li>11. N. Srivastava, MD, Uttar Gujarat Vij Company Limited</li> <li>12. S.K. Ray, Chairman &amp; MD, Tripura State Electricity Corporation Limited</li> <li>13. Shekhar Khadilkar, Group Head, Demand Side Management and Assistant General Manager, Tata Power Mumbai Distribution Limited</li> <li>14. Ms Meenu Mishra, Advisor, Regulatory Services, BSES Yamuna Private Limited</li> <li>15. N K Sardana, Chief Engineer, Uttar Haryana Bijli Vitran Nigam</li> <li>16. K N Parikh, Superintending Engineer, Madhya Gujarat Vij Company Limited</li> </ol>
BEE	<ol style="list-style-type: none"> <li>17. Ajay Mathur, Director General, Bureau of Energy Efficiency</li> <li>18. Smt. Pravatanalini Samal, Assistant Energy Economist , Bureau of Energy Efficiency</li> </ol>
Others	<ol style="list-style-type: none"> <li>19. Rahul Garg, Associate Director, UTC Climate, Controls and Security India</li> <li>20. Keshav Verma, Senior Manager, UTC Climate, Controls and Security India</li> <li>21. Dr. Mahesh Patankar, Managing Director, MP Ensystems Advisory Private Limited</li> <li>22. V. Ramakrishna, Former Member , Central Electricity Authority</li> </ol>
Secretariat	<ol style="list-style-type: none"> <li>23. Saurabh Kumar, Managing Director, Energy Efficiency Services Limited</li> <li>24. Krishan Dhawan, CEO, Shakti Sustainable Energy Foundation <ol style="list-style-type: none"> <li>i. Chinmaya Acharya, Chief of Programmes, Shakti Sustainable Energy Foundation</li> <li>ii. Natasha Bhan, Senior Programme Associate (Electric Utilities), Shakti Sustainable Energy Foundation</li> <li>iii. Vrinda Sarda, Programme Assistant, (Electric Utilities), Shakti Sustainable Energy Foundation</li> <li>iv. Kulbhushan Kumar, Senior Manager, (Energy and Utilities), PwC India</li> <li>v. Shuboday Ganta, Senior Consultant, (Energy and Utilities), PwC India</li> <li>vi. Neelima Jain, Program Co-ordinator GIZ, Energy Efficiency Services Limited</li> <li>vii. Pooja Shukla, Company Secretary, Energy Efficiency Services Limited</li> <li>viii. Ashish Sharma, Deputy Manager, Energy Efficiency Services Limited</li> <li>ix. Nitin Wadhwa, Assistant Manager, Energy Efficiency Services Limited</li> </ol> </li> </ol>



---

# *Table of contents*

---

1. Inaugural session	7
Welcome address	7
Setting the context	7
2. Theme: Presentations and discussions	8
Presentation: Maharashtra Electricity Regulatory Commission (MERC)	8
Presentation: PwC	9
3. Case studies	11
Presentation: R Infra	11
Presentation: EESL	12
Presentation: United Technologies	12
4. Conclusion	13

--	--

# 1. Inaugural session

## Welcome address

Krishan Dhawan, CEO, Shakti Sustainable Energy Foundation (Shakti), addressed the meeting and gave a brief overview of the Forum's activities over the past year. He underlined the four themes that had evolved during the



Krishan Dhawan, CEO, Shakti Sustainable Energy Foundation

previous meetings of the Forum. He also expressed confidence about the Forum gaining traction owing to increased participation, especially from the senior management of various utilities and electricity regulatory commissions across the country.

Mr Dhawan announced Energy Efficiency Services Limited (EESL) as the co-promoter of the Forum. He expressed hope that EESL's technical assistance and advisory services will help boost the Forum's activity.

He further pointed that a sound methodology-in-place for analysing the cost effectiveness of DSM investments is an essential cog in the DSM process. This justified the selection of the Forum's

current theme, 'Cost Effectiveness of Utility Driven DSM investments'. Shakti had commissioned PwC to design a tool for an Indian state that would help in assessing cost effectiveness of DSM programmes. He thanked the chairpersons of the regulatory commissions, Dr Ajay Mathur from the Bureau of Energy Efficiency as well as other dignitaries for their presence.

## Setting the context

Anil Razdan, Chairperson, thanked all participants for their association with the Forum. He opined that, although the country has consistently increased the installed capacity of thermal power generation, at the rate of 20,000 MW per year, the supply side is still plagued by many issues, most notably, continually increasing prices of coal and gas supplies. He further asserted the need to focus on DSM. This is because its focus on efficiency and optimisation helps the environment as well as sustainability.

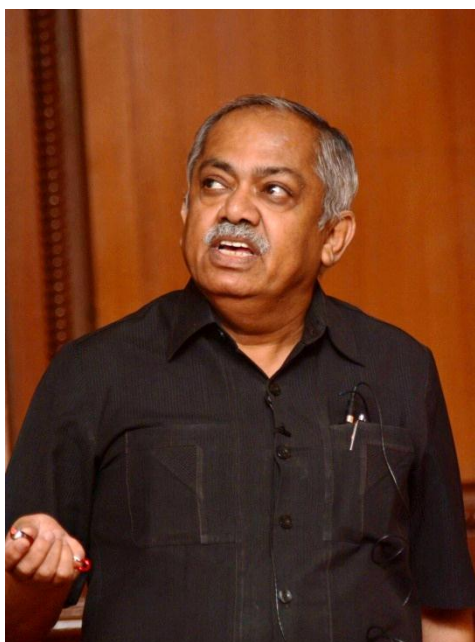
He cited the success of DSM initiatives in Maharashtra and emphasised on the role of the state electricity regulatory commission (SERC) in leading the way on DSM regulations. In addition to the capacity building of utilities, creating awareness among the consumer pool is an equally important factor that drives the outcome. He also suggested that the Forum's secretariat, with support from the participants, may study the DSM initiatives, piloted in four or five Indian metro towns, and identify the factors that contributed to the success or failure of these initiatives. In conclusion, he asserted that the SERCs have a pivotal role to play in driving and guiding the utilities' efforts towards DSM programmes operated on a MW scale.



Anil Razdan, Former Secretary, Ministry of Power

## 2. Theme: Presentations and discussions

### **Presentation: Maharashtra Electricity Regulatory Commission (MERC)**



V L Sonavane, Member, Maharashtra Electricity Regulatory Commission

V L Sonavane of the MERC spoke on the occasion. He presented the existing DSM legal, policy and regulatory framework in Maharashtra. Mr Sonavane initially spoke about the importance of DSM in general, various stakeholders and the potential for energy and demand savings in various sectors. He also detailed the progress of the DSM regulatory framework in India.

While elaborating on the case of Maharashtra, Mr Sonavane apprised the meeting of DSM Consultation Committee that meets frequently to plan, evaluate and approve various DSM programmes. The committee, under the Secretary, Energy Department, includes the MERC, representatives of the distribution licensees, consumer representatives, and research institutions such as Indian Institute of Technology Bombay and Veermata Jijabai Technological Institute. He further opined that the DSM consultation committee was successful in driving the establishment of the DSM cells within DISCOMs. He highlighted various DSM pilot projects initiated under the oversight of the DSM consultation committee, and further asserted that the DISCOMs in Maharashtra have submitted the DSM Plans up to 2015-16.

Speaking about the cost-effectiveness regulations (a first of its kind) released by MERC, he explained the various tests, which establish cost-effectiveness of DSM investments. He asserted that these indicators are jointly established by the DISCOMs and the consultation committee before petitioning the DSM programme proposal to the MERC for approval. He also explained the screening criteria adopted in the regulations as shown in the table below:

Test	Selection criteria	Action
Total Resource Cost (TRC) Test	Positive NPV of the benefits over the cost	Programme should be considered for the RIM test
Ratepayer Impact Measure (RIM) Test	Positive NPV of the benefits over the cost for ratepayers	Programme should be implemented directly without LCRIM test
Life Cycle Revenue Impact (LCRIM) Test	Tariff impact of programme less than 1PS /kWh or less than 1% of existing tariff, whichever is higher	Programme should be implemented (may check for PCT and SCT)

Mr Sonavane asserted that the MERC has been able to approve five DSM programmes, focussing on the efficient ceiling fans and LED lamps, based on the cost-effectiveness assessment framework.

He concluded by recounting the importance of regulations and guidelines on cost-effectiveness.



## Presentation: PwC

Kulbhushan Kumar, PwC, primarily focussed on the issues and challenges around the establishment of cost-effective indicators for different kind of DSM programmes. He gave an overview of the evolution of cost-effective tests globally and related it with the Indian scenario. The presentation also detailed a case study and a tool was demonstrated that can help discoms to overcome several issues in assessing cost-effectiveness. He provoked an in-depth discussion by participants on the application and the utility of such tools.



Kulbhushan Kumar, Senior Manager, PwC

He asserted that a DSM programme, if conclusively proved to be cost-effective, will be better placed to receive the attention (and funding) necessary for deployment. The Indian regulatory framework has recognised the importance of this assessment and mandated the establishment of cost-effectiveness to obtain the necessary regulatory approvals. He explained that the three most important factors that influence cost effectiveness indicators are the *cost of energy efficient equipment*, *revenue loss to the utilities* and the *avoided costs of energy and capacity*. He further illustrated three different scenarios to highlight the minimised costs derived from the application of DSM programmes.

Based on a review of the current regulatory framework, Mr Kumar enumerated the various challenges as well as proposed some recommendations that will help in establishing cost-effectiveness of DSM programmes in India. He also detailed a case study to evaluate cost-effectiveness of the DSM programmes in an Indian state. This was done through the application of an in-house tool developed under the sponsorship of the Shakti Foundation. The tool is expected to serve as a model for evaluating the cost-effectiveness of the DSM programmes by the DISCOMs and commissions in other states.

During tool demonstration, he showed the applicability of the tool for establishing the cost-effectiveness for six different programmes. Mr Kumar emphasised the rigour maintained in forecasting hourly load or demand as well as in analysing the supply curves of planned power resources. He demonstrated the flexibility to vary input parameters, according to user requirements, and assess test results in varied conditions. The tool also helps compute the maximum possible incentives to keep the programmes cost-effective.

A major recommendation was that the DSM resource acquisition needs to be undertaken during the power procurement planning stage in order to leverage the avoided capacity benefits that can be realised with DSM programmes resulting in peak demand reduction. A key insight gained while developing the tool was the *timing of the DSM resource acquisition which is a critical factor driving the cost effectiveness of DSM initiatives*.

The chairperson suggested conducting a workshop for the technical and financial staff of utilities and commissions to help them understand the computational methodology and the robustness of this tool. Following such a workshop, the tool could then be discussed with the senior management of utilities.

The following questions were posed to the participants during the discussion.

1. *Are there any other indicators, apart from the five cost effectiveness tests discussed in this session, for establishing the cost effectiveness of DSM programmes?*
2. *Which indicators will establish cost effectiveness of a DSM programme in an ESCO's perspective?*
3. *What are the indicators for screening DSM programmes based on cost effectiveness?*

4. *Is there a need for the model regulations on establishing cost effectiveness for DSM programmes?*
5. *Is there a need to standardise methods for computing the avoided costs of power resulting from DSM programmes?*
6. *Is there a need to disaggregate the avoided costs of power across time of the day and calendar month in the forecasting time frame?*
7. *Is there a need to consider DSM programmes which have an impact on consumer tariffs? If yes, what should be the permissible extent of impact?*

Key points of the discussions that ensued are listed in the table below:

Key points of discussion	
Indicators representing cost effectiveness of the DSM programmes	<p>Dr Mahesh Patankar suggested that the power quality and availability may also be factored into the assessment as a benefit to the utilities.</p>
Robustness and versatility of the tool	<ul style="list-style-type: none"> <li>▪ R N Prasher, Chairperson HERC suggested that the primary purpose of the hydro resources, i.e. irrigation and drinking water supply, needs to be considered while analysing availability.</li> <li>▪ Rakesh Sahni, Chairperson, MPERC, stated that standardising the load patterns may prove difficult owing to the diverse factors. He suggested that a menu be provided along with the tool. This will help the utility or regulator select the most appropriate option during assessment.</li> <li>▪ Meena Mishra, BYPL, also supported this view of the MPERC.</li> <li>▪ <i>PwC and Shakti informed the participants that the proposal was to standardise the methodology of deriving the load patterns and not load patterns.</i></li> <li>▪ U N Panjiar, Chairperson, BERC pointed out that many utilities resort to load shedding. They rely on long-term power purchase agreements and avoid short-term power purchase. Hence, a reduction in peak demand by implementing a DSM measure may contribute to a reduction in the quantum of load shedding rather than avoiding power purchase costs. This may have to be incorporated into the tool as well.</li> <li>▪ <i>PwC stated that the tool has been developed to incorporate various scenarios as desired, according to user flexibility. A utility may use their own methods to generate data on load forecasts and supply stacks.</i></li> <li>▪ There was a general consensus that state-specific cost effectiveness assessment models will greatly help regulators shape up their decision making process.</li> </ul>
Validity of the tool	<p>The chair suggested that the limitations of applying the tool should be clearly articulated. This will lend validity to the developed tool.</p>
Consumer awareness	<ul style="list-style-type: none"> <li>▪ U N Panjiar, BERC suggested that cost effective assessments needs to incorporate criteria that reflect benefits to consumers in addition to the benefits of other stakeholders.</li> <li>▪ Meena Mishra, BYPL, also laid emphasis on the importance of raising consumer awareness about DSM initiatives.</li> <li>▪ Dr Ajay Mathur, DG, BEE, recalled the implementation of appliance labelling, when a massive consumer outreach programme was launched to create awareness about the benefits of star labelled products.</li> </ul>

## 3. Case studies

### **Presentation: R Infra**



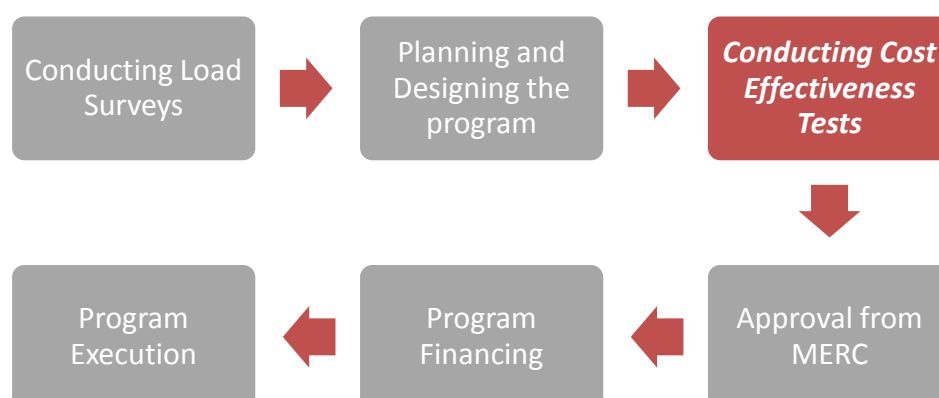
Pramod Deo, Addl. VP, R Infra

This case study was presented by Pramod Deo, Reliance Infrastructure Limited. He began his session describing the R Infra's approach to DSM programmes from concept to execution.

Mr Deo gave a detailed description of each step, laying emphasis on the cost effectiveness tests. He presented the results of the various tests computed while designing the DSM programme focussing on refrigerators. As a part of this programme, 3725 units of refrigerators were replaced, resulting in total annual savings of up to 1.07 MU in 2012-13. In order to measure the savings, meters were installed at sites to capture readings and

compute the average consumption values before and after the replacement. On completion of the programme, a survey was conducted by a marketing agency to understand the acceptance of the offer, product, and reasons for non-participation. He concluded the session by listing various DSM programmes rolled out by R Infra in the Mumbai distribution circle.

#### **Reliance's approach to DSM Programs – Concept to Execution:**



Key points of the discussions that ensued are listed in the table below:

#### **Key points**

Handling of replaced refrigerators	The chair enquired about the appropriate treatment of the discarded refrigerators. He stated that steps need to be taken to ensure their proper disposal. Mr Deo pointed that R Infra had taken the support of a prominent domestic manufacturer to ensure environmental friendly disposal of the discarded refrigerators.
Environment cost	The chair opined that the regulators need to introduce mechanisms to realistically incorporate environment cost in the DSM programme appraisal process.
Impact of improved technology	One of the participants opined that the effects of improvement in technology need to be factored into the DSM programme evaluation and an assessment of the increase in savings as well as the comparative rise in cost should be done. Dr. Patankar put forth that such a scenario was encountered while implementing the Refrigeration program. An upgrade in technology enabled higher amount of energy savings

## Purchase of EE equipment

Rakesh Sahni, MPERC suggested that procurement of energy efficient equipment could be made simpler if the agency mandates manufacturers to supply directly under an agreed area-wise price band and the choice be left to customers in purchasing the equipment. This can increase transparency and avoid misconceptions about DISCOMs procurement principles in such bulk purchases of equipment.

## ***Presentation: EESL***

Saurabh Kumar, Managing Director of EESL, presented three case studies of evaluating the cost-effectiveness of the DSM programmes, which benefitted from EESL's investments through energy performance contracting. Based on the investments considered by EESL in the past years, he also highlighted some issues on scalability and evaluation of the DSM programmes.



Saurabh Kumar, Managing Director, EESL

The first case study presented was on DSM based Efficient Lighting Programme (DELP scheme), a scheme similar to- the Bachat Lamp Yojana, which aims to replace incandescent bulbs with LEDs. The second case study was an Agriculture DSM programme in Karnataka, replacing about 600 pumps with energy efficient star labelled pump sets. The third case study was an example of the municipal street lighting programme.

## ***Presentation: United Technologies***



Rahul Garg, United Technologies

Mr Rahul Garg of United Technologies explained innovative solutions and services to improve the energy efficiency in the fast growing commercial buildings market in India. Retrofitting existing building systems and integrated solutions for new buildings was the primary focus of the ensuing discussion.

---

## ***4. Conclusion***

The Forum acknowledged that the cost-effectiveness assessment of the DSM programmes will help utilities recognise and quantify the cost effective potential of demand side resources which in turn will enable utilities to judge the competitiveness of the DSM measures against conventional resource and supply options. Many participants also agreed that the existence of regulations and guidelines will ensure guidance and transparency in the regulatory process of the DSM programme appraisal and approval. The meeting was unanimous that proactive Regulators can help establish a culture of DSM.

'DSM awareness among the consumers' was another important theme discussed actively among the participants. In order to enhance this aspect, the chairperson recommended a study of DSM programmes initiated in four to five metros. He also suggested that such a study needs to be able to effectively communicate and conclusively prove the benefits of DSM programmes to the consumers. Success stories need to be analysed, propagated and replicated.

