Utility CEO Forum on Demand Side Management

Model State Policy on Utility driven Demand Side Management

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Introduction

Utility driven electricity demand side management (DSM) programmes in India have remained largely in the form of pilot projects and have not been scaled up for the mass of consumers. There is also no clarity around the obligation or targets on electricity distribution licensees (Utility) to acquire cost-effective DSM resources for meeting electricity demand in the short- or medium term. In the absence of an overall target or goal, DSM programmes are undertaken on a piecemeal basis and are often neglected in the annual multi-year planning process of Utilities.

Since the business of electricity distribution is licensed and regulated in India, the presence of an enabling legal and policy framework is fundamental to the up-scaling of Utility driven DSM investments in the country. Utility sponsored DSM efforts in India driven by legislation, policy and regulation started only about a decade ago.

The following sections identify the critical gaps in some of the major policy instruments in the Indian Electricity Industry and further propose necessary amendments for creating a conducive policy environment for Utility driven DSM investments in the country.

Review of legal and policy framework for Utility driven DSM in India

Energy Conservation Act, 2001

The Energy Conservation Act, enacted in 2011, created the Bureau of Energy Efficiency (BEE), under the Ministry of Power, as the designated nodal agency to promote energy efficiency and conservation in various sectors of the Indian economy. The act was primarily aimed at improving the energy efficiency norms in certain energy-intensive consumer segments and creating a mandatory framework for standards and labelling of appliances and buildings in India.

The Energy Conservation Act did not provide explicit provisions for the promotion and implementation of utility driven DSM in India.

Electricity Act (EA), 2003

The Electricity Act was enacted in 2003 to transform the power sector in India and has repealed three previously enacted laws namely the Indian Electricity Act, 1910, the Electricity (Supply) Act, 1948, and the Electricity Regulatory Commission Act, 1998, that were guiding the electricity supply and pricing mechanisms in the country. The EA has created a consolidated policy framework for generation, transmission, distribution, trading and consumption of electricity adhering to market-based mechanisms. The EA also aimed to promote efficient and environmentally benign policies across the value chain of electricity in India.

The Section 23 of the EA 2003, provides Directions to Licensees that "If the Appropriate Commission is of the opinion that it is necessary or expedient so to do for *maintaining the efficient supply*, securing the equitable distribution of electricity and promoting competition, it may, by order, provide for regulating supply, distribution, consumption or use thereof". Section 42 (1) of the EA 2003 states that "*it shall be the duty of a distribution licensee to develop and maintain an efficient, coordinated and economical distribution system in his area of supply and to supply electricity in accordance with the provisions contained in this Act*", section 62 (D) has empowered the State Electricity Regulatory Commission (SERC) to determine tariffs for retail sale of electricity, section 61 (C) allowed the SERC to regulate tariffs by considering "*the factors which would encourage competition, efficiency, economical use of resources, good performance and optimum investments*", section 61(D) allowed the commissions to *'reward utilities based on the principles of efficiency in performance'*, section 86 (2.1) allowed the regulatory commission to advise the state governments on matters of *'promotion of competition, efficiency and economy in activities of the electricity industry*', and section 86 (4) of EA

2003 provided that '*in discharging its functions, the SERCs shall be guided by the National Electricity Policy and the National Electricity Plan*'.

While these provisions in the EA 2003 call for efficiency and economical use of resources, DSM can only be an implicit alternative for utilities under such provisions as several other options exist for the utilities to bring about efficiency and economical use of resources.

National Electricity Policy (NEP), 2005

This policy was ratified in 2005 and provided a detailed set of initiatives and programmes to carry out the mandates of the Electricity Act 2003. The NEP sought to address issues related to rural electrification, generation, transmission, distribution, recovery of cost of services and targeted subsidies, technology development and R&D, competition, financing power sector programmes, energy conservation, environmental issues, training and human resource development, cogeneration and non conventional energy sources, protection of consumer interests and quality standards.

The section 5.9 of the NEP is dedicated to energy conservation and outlines several provisions to promote and advance energy efficiency and demand side management measures in the Indian economy.

5.9.1. There is a significant potential of energy savings through energy efficiency and demand side management measures. In order to minimize the overall requirement, energy conservation and demand side management (DSM) is being accorded high priority. The Energy Conservation Act has been enacted and the Bureau of Energy Efficiency has been setup.

5.9.2. The potential number of installations where demand side management and energy conservation measures are to be carried out is very large. Bureau of Energy Efficiency (BEE) shall initiate action in this regard. BEE would also make available the estimated conservation and DSM potential, its staged implementation along with cost estimates for consideration in the planning process for National Electricity Plan.

5.9.3. Periodic energy audits have been made compulsory for power intensive industries under the Energy Conservation Act. Other industries may also be encouraged to adopt energy audits and energy conservation measures. Energy conservation measures shall be adopted in all Government buildings for which saving potential has been estimated to be about 30% energy. Solar water heating systems and solar passive architecture can contribute significantly to this effort.

5.9.4. In the field of energy conservation initial approach would be voluntary and self-regulating with emphasis on labelling of appliances. Gradually as awareness increases, a more regulatory approach of setting standards would be followed.

5.9.5. In the agriculture sector, the pump sets and the water delivery system engineered for high efficiency would be promoted. In the industrial sector, energy efficient technologies should be used and energy audits carried out to indicate scope for energy conservation measures. Motors and drive system are the major source of high consumption in Agricultural and Industrial Sector. These need to be addressed. Energy efficient lighting technologies should also be adopted in industries, commercial and domestic establishments.

5.9.6. In order to reduce the requirements for capacity additions, the difference between electrical power demand during peak periods and off-peak periods would have to be reduced. Suitable load management techniques should be adopted for this purpose. Differential tariff structure for peak and off peak supply and metering arrangements (Time of Day metering) should be conducive to load management objectives. Regulatory Commissions should ensure adherence to energy efficiency standards by utilities.

5.9.7. For effective implementation of energy conservation measures, role of Energy Service Companies would be enlarged. Steps would be taken to encourage and incentivise emergence of such companies.

5.9.8. A national campaign for bringing about awareness about energy conservation would be essential to achieve efficient consumption of electricity.

5.9.9. A National Action Plan has been developed. Progress on all the proposed measures will be monitored with reference to the specific plans of action.

Although the section 5.9 of NEP accords high priority to energy efficiency, conservation and load management techniques, there is no mandatory framework to undertake DSM investments by Utilities. Therefore the following amendments are proposed, in the section 5.9 of NEP 2005, to strengthen the policy framework for Utility driven DSM investments in India.

- The Distribution Licensees should carry out load research and market research studies aimed at quantifying DSM resource potential at the beginning of every Five year plan period

- The Distribution Licensees should consider DSM as a resource to meet the demand for electricity in the annual planning process. The state governments should mandate that *"the Utilities, in meeting its energy needs for every control period, should evaluate options to invest in DSM resources, which are cost-effective, reliable, and feasible, along with other resources for electricity supply"*

Similarly the section 6 of National Tariff Policy should also be amended allowing the SERCs to provide incentives/disincentives through tariff structure to promote energy efficiency and load management. The amendments in the national tariff policy should also mandate SERCs to allow the recovery of DSM expenses from consumers after necessary due diligence.

Demand Side Management regulations in India

In May 2010, the forum of regulators published the Model DSM regulations for the SERCs in the country to adopt this as a guiding document while notifying DSM regulations in the state. As per this model, state distribution licensees need to make DSM an integral part of their day-to-day operations, and undertake planning, designing and implementation of cost-effective DSM programmes on a sustained basis. The model regulations have also made provisions for the distribution licensees in the state to recover all costs incurred by them in any DSM related activity, including planning, designing, implementing, and monitoring DSM programmes, by adding these costs to their annual revenue requirements and thus enabling rate payer funded DSM investments in the country.

Following this, states like Gujarat, Tamil Nadu, Maharashtra and Himachal Pradesh have notified DSM regulations by interpreting the relevant provisions under the Electricity Act 2003 (section 23, 42(1), 61, 62, 86(2.1), 86(4)) and the National Electricity Policy 2005 (sections 5.9.2/4/6).

The DSM regulations in the above mentioned states broadly covered the following aspects:

- DSM objectives, potential and targets

- Constitution of DSM cell and its roles and responsibilities

- DSM process guidelines

    - Load and market research and development of baseline data
    - Formulation of DSM plan
    - Review and approval of DSM plan by the commission
    - Preparation of DSM programme document
    - Approval of DSM programme document
    - Implementation of DSM programmes
    - Mechanism for cost recovery
    - Monitoring and reporting of DSM programmes
    - Evaluation, measurement and verification (EMV) of DSM programmes

Nevertheless, there are some critical gaps in the DSM regulations notified till date in the country. The absence of a clear quantified target or goal, in terms of reduction in kWh/MW or amount of

DSM investments in a specified period of time, is allowing the utilities to delay megawatt scale investments towards acquiring cost-effective DSM resources. Also, there is a lack of a clear, unambiguous and explicit regulatory mandate that the utilities, in meeting its energy needs, would invest first in energy efficiency and demand-side resources, before considering other resources for electricity supply[1].

Integrated Energy Policy (IEP), 2008

The IEP is the first comprehensive energy policy ratified by the Indian government and oversees all energy sectors in 2008. The chapter VI of IEP is dedicated to energy efficiency (EE) and DSM and details the potential for EE/DSM, identifies the major barriers that constrain the adoption of EE/DSM schemes in the country and further provides appropriate policy recommendations to overcome these barriers. Section 1.5 of chapter VI of IEP identifies high transaction costs, lack of incentives to utilities who perceive DSM as a loss of market base, inadequate awareness, lack of access to capital, perceived uncertainty concerning savings, a high private discount rate, limited testing infrastructure to ascertain savings and an absence of a reliable measurement and verification regime, as the major barriers for EE/DSM in the country. Some of the policy recommendations in the IEP that enable utility driven DSM in the country are listed below.

- Regulatory commissions can allow utilities to factor EE/DSM expenditure into the tariff structure.

- Each energy supply company or utility should setup an EE/DSM cell. The BEE can facilitate this process by providing guidelines and necessary training inputs. A large number of pilot programmes that target the barriers involved and have low transaction costs need to be designed, tested with different institutional arrangements, with different incentives and with varied implementation strategies. Innovative programme designs can then be rewarded.

- **Implementing time-of-day (TOD) tariffs:** All utilities need to introduce TOD tariffs for large industrial and commercial consumers to flatten the load curve. Utilities need to support load research to understand the nature of different sectoral load profiles and the price elasticity of these loads between different time periods to correctly assess the impact of differential tariffs during the day. The utility needs to have focus group meetings with industrial or large commercial consumers, document a few potential case studies illustrating the potential for shifting loads and provide information and analytical support along with implementation of the TOD tariff.

- **Facilitating grid interconnection for co-generators:** Enforce mandatory purchase of electricity at fixed prices from co-generators (at declared avoided costs of the utility) by the grid to encourage co-generation. The buying or selling price should be time- differentiated and declared by the state regulatory commissions at the time of each tariff notification.

- **Improving efficiency of industrial, municipal and agricultural water pumping:** Institute measures that encourage the adoption of efficient pumping systems and shifting of pumping load to off-peak hours. The public sector should be mandated to do so, and the private sector can be encouraged to do so through time-of-day pricing. This will help reduce peak energy demand.

- **Instituting an efficient motors programme:** Focus on manufacturers and rewinding shops and target market transformation, policy for energy efficiency and DSM by providing incentives to supply energy efficient motors.

[1] A similar policy was adopted in the state of California, which is generally perceived as the epitome of DSM investments in the world. This policy adopted in 2003 required all utilities in California to first meet their "unmet resource needs through all available energy efficiency and demand reduction resources that are cost effective, reliable, and feasible".

- **Promoting solar hot water systems:** Aim at both industrial and household needs of hot water.
- **Promoting variable speed drives:** Assess suitability of variable speed drives for major pumping and fan loads.
- **Undertaking efficient lighting initiative:** Pilot efficient lighting initiatives in towns and cities. Features should include warranties by manufacturers and deferred payment through utility bill savings.
- **Making energy audits compulsory for all loads Above 1 MW:** Periodic energy audits mandatory for public buildings, large establishments (connected load >1 MW or equivalent energy use >1MVA) and energy intensive industries.

National Mission for Enhanced Energy Efficiency (NMEEE)

The government of India has recently approved the NMEEE as one of the eight missions under the National Action Plan on Climate Change (NAPCC). The BEE is the designated agency to implement the activities planned under NMEEE. This mission outlines four new initiatives to promote the energy efficiency industry in India:

- **Perform achieve and trade (PAT) scheme:** A market based mechanism to enhance cost-effectiveness of energy-efficient initiatives in energy-intensive large industries and facilities through certification of energy savings that could be traded
- **Market transformation of energy efficiency (MTEE):** Accelerating shift to energy-efficient appliances in the designated sectors (residential, commercial, industrial, agricultural pumping, municipal water pumping and street lighting) of the economy
- **Energy efficiency financing platform (EEFP):** Creation of innovative mechanisms to finance energy efficiency and DSM projects through energy savings
- **Framework for energy-efficient economic development (FEEED):** Developing fiscal instruments to promote energy efficiency

BEE has achieved considerable progress in the development and implementation of the PAT scheme, the super efficient equipment programme (SEEP) and the partial risk guarantee fund (PRGF) to facilitate MTEE and EEFP. These initiatives designed by BEE may contribute to significant electrical energy and demand savings across the country. However, there is no framework to promote utility driven DSM among the abovementioned initiatives[2].

Need for state intervention to strengthen the DSM policy framework

In summary, utility driven DSM in India has been recognised and accorded priority with several actions initiated to facilitate and ensure its implementation. However, the electricity industry, being regulated, needs a clear, unambiguous and explicit mandate to invest in demand-side resources.

[2] The incentives proposed under the SEEP programme could be directed to consumers and channelled through the electric utilities to promote DSM. Another widely acknowledged financing instrument for promoting DSM is the '*On-bill financing (OBF)*', which is successfully adopted across the world. OBF generally refers to a financial instrument that is serviced by or in partnership with a utility company for energy efficiency improvements and repaid by the customer on its monthly utility bill. Integrating loan payments with energy bills and allowing utilities to cut off energy supply to defaulting customers has the potential to both lower collection costs and enhance credit quality of the financing scheme, thereby lowering financing costs. Payment via the utility bill reduces the risk of credit default and lowers collection risk. OBF instruments can leverage a utility's unique relationship with energy customers to provide convenient access to funding for energy efficiency investments.

Apart from this, as discussed before, the absence of a clear quantified target or goal, in terms of reduction in kWh/MW, is allowing Indian utilities to delay investments towards megawatt scale DSM programmes. There is also a lack of mechanism for coordination between various stakeholders such as state designated agencies (SDAs), state distribution licensees, BEE and SERCs to undertake DSM activities.

The state governments can play a crucial role in overcoming these gaps. This paper aims to provide a guiding document to the Indian states for establishing a policy framework, and setting reasonable targets to undertake DSM investments. The paper also aims to present a model DSM process, programme implementation, and institutional framework for the administering of related activities at the state level.

The structure of this paper resembles that of a typical policy notification by Indian states. The state governments while taking cognisance of the slow progress of DSM investments can use this paper to develop a 'state DSM policy' that can guide its stakeholders for scaling up the DSM investments.

Utility driven Demand Side Management policy for Indian states

In exercise of powers conferred by Section 108 of the Electricity Act, 2003, the state government hereby notifies the following policy for promoting the Utility driven Demand Side Management in the state.

Preamble

This section should adequately address the need for DSM investments in the state. The section should be reflective of the current scenario of the state's power sector, issues with rising power demand, financial health of the utilities and other driving factors for investing in DSM resources. Modifications may be required to incorporate state specific conditions and attributes. Trends relating to electricity consumption, peak demand and per-capita consumption of electricity can be provided to substantiate the claims made in this section.

Various factors such as increasing economic activity and population growth are resulting in additional pressure on ever-increasing power demand when the state is already facing acute power shortages. Bridging demand supply gaps through cost-effective resource acquisition has been one of the biggest challenges for state governments.

International experience suggests that DSM can be successful in acquiring cost-effective resources for bridging demand-supply gaps. DSM explicitly refers to all those activities that involve deliberate intervention by the utility in the marketplace so as to alter the consumer's load profile. DSM programmes can help utilities meet peak power requirements in a cost-effective manner, flatten the overall load curve, reduce energy costs for both the utility, and its customers, and in the long term, limit or delay the requirement for further generation capacity augmentation. In summary, well designed DSM measures can improve the service quality of the utility through enhanced system reliability, promote efficient end use of electricity by utility customers and enhance customer satisfaction. Apart from the direct benefits to utilities and their customers, there are environmental benefits derived from DSM programmes. DSM programmes can substitute for power plants and result in fewer green house gas emissions and also help the country improve its energy intensity. Therefore DSM has never been more important than it is now.

Utility driven DSM in the state has been recognised and accorded priority with several actions initiated to facilitate and ensure its implementation. However, the electricity industry, being a regulated industry, needs a clear, unambiguous and explicit mandate to invest in cost-effective DSM resources. The absence of a clear quantified target or goal, in terms of reduction in kWh/MW, is also allowing the state's utilities to delay investments towards megawatt scale DSM programmes. There is also a lack of mechanism for coordination between various stakeholders such as state designated agency (SDA), state distribution licensee (Utility), bureau of energy efficiency (BEE) and state electricity regulatory commission (SERC) to undertake DSM activities.

In this regard, the state government, while taking cognisance of the slow progress of DSM investments in the state, intends to notify the 'state DSM policy', focussed to provide a clear vision, target, obligatory functions, incentives and a roadmap that can guide its stakeholders for scaling up the acquisition of cost-effective DSM resources in meeting the state's electricity demand.

Definitions and scope

Cost effectiveness means an indicator of the attractiveness of any investment in the DSM programme or when compared to the costs of energy produced and delivered in the absence of such an investment.

Demand side management means actions of a utility, *beyond the customer's meter*, to alter the end-use of electricity, whether it be to increase demand, decrease it, shift it between high and low peak periods, or manage it when there are intermittent load demands, in the overall interests of reducing the cost of power to create a win-win situation for both utilities and consumers.

The broad set of DSM resources that fall under the scope of this definition is mentioned below[3].

Load management techniques:

- *Dynamic or real-time pricing*: This pricing mechanism is based on real-time system of supply and demand characteristics. Time of day (TOD) tariffs, load factor and power factor incentives introduced by many utilities in the country is one of the examples of this category of DSM measures.
- *Demand response*: This is a voluntary load curtailment measure adopted to manage peak system load. Electronic media including web-based communication systems and tools can be used to convey information on the prevailing demand, supply, and prices on a real-time basis and award incentives for voluntary curtailment of the load.

Load reduction techniques:

- Utility sponsored incentives to adopt energy-efficient technologies, equipment, appliances across various classes of end-users in the economy
- Utility sponsored incentives to install rooftop solar PV and thermal technologies that can offset the power demand on the power grid.

Demand savings means the avoided capacity augmentation (MW) calculated using the formula mentioned below.

$$Demand\ savings, MW = \frac{Energy\ Savings\ (MWh) * PCF}{PLF * (1 - T\&D) * Annual\ hours\ of\ operation}$$

- Energy savings in MWh
- PLF = Plant load factor
- T &D = Transmission and distribution loss
- PCF= Peak coincidence factor

Distribution licensee means a licensee authorised to operate and maintain a distribution system for supplying electricity to the consumers in this state.

DSM resource acquisition means a mechanism to implement DSM projects through customers, energy service companies, non-government organisations, manufacturers and suppliers, or other private sector organisations, with payment made to them by the distribution licensee for resultant energy and load reductions.

[3] Loss reduction techniques like infrastructure up-gradation, feeder segregation and many other interventions, which are not actions beyond the customer's meter, cannot be considered DSM resources.

Energy services company (ESCO) means a company in the business of providing energy-efficient and load management equipment or services to end-users.

Economic potential refers to the technical potential of those energy efficiency measures that are cost-effective when compared to supply-side alternatives. The cost effectiveness of energy efficiency measures is perceived based on the results of the utility test.

$$Economic\ potential = \sum Technical\ potential * Bi$$

B_i = Binary factor representing the result of utility cost effectiveness test of individual energy efficiency measures

Cost elements for the utility test shall be determined considering the following.

- Incentive shared by the utility
- Programme administration, monitoring and evaluation costs
- Programme marketing costs

The benefits of the utility test should be equal to the marginal cost of energy sold by the utility minus the loss of revenue resulting from the energy savings.

$$Benefit = Marginal\ cost\ of\ energy - Tariff$$

The benefits have to be valued over the period which the assessment is to be carried out. While calculating energy and demand savings as benefits, year-on-year escalation rate of 5% should be considered. Tests should consider a discount rate of 10.5%. Both benefits and costs shall be calculated over the 'life' of the technology being deployed. The 'life' should be the 'warranted' life of the retrofit by the technology provider as it is important to ensure that the savings considered are realised over the life-span of the equipment or appliances.

Monitoring and reporting means activities which monitor and evaluate the progress of DSM/energy efficiency programmes of the distribution licensee.

Notification means notification published in the official gazette and the consequent expression 'notify' shall be construed accordingly.

Technical potential is a theoretical construct of the technical upper bound of energy efficiency and conservation potential with complete market penetration of energy-efficiency practices, deemed technically feasible from an engineering perspective. Technical potential does not consider cost or acceptability factors of the customer. It does not reflect a level of potential that is achievable through voluntary energy efficiency programmes. Technical feasibility limits installation to situations where installation is physically practical (e.g., available space, noise considerations, and lighting level requirements are considered, among other things). This potential can be estimated using a bottom-up approach by evaluating the entire umbrella of energy efficiency measures. Annexure-1 provides a broad set of energy efficiency practices, technologies, appliances and equipment for different end-use applications, categorised under various sectors of Indian economy.

$$\text{Technical potential} = \sum \text{Energy savings per measure} * \text{market size} * \text{penetration factor} * \text{feasibility factor}$$

The market size is an estimate of the overall connected load of the specific end-use appliance or technology in a definite geographical region. The penetration factor is an estimate of the current market penetration of energy efficiency technology in the overall market size. The penetration factor and the market size can be estimated through primary surveys using questionnaires.

State designated agency (SDA) means the agency designated, under clause (d) of section 15 of the Energy Conservation Act 2001, to coordinate, regulate and enforce provisions of this act within the state.

State electricity regulatory commission (SERC) means the agency constituted under sub-section (1) of section 82 of the Electricity Act 2003.

Utility means the distribution licensee.

DSM policy objectives

The objectives defined here should focus on achieving the key drivers for DSM investments, discussed in the preamble.

- To control, reduce and influence electricity demand by implementation of suitable energy efficiency and load management measures
- To encourage consumers to amend their electricity consumption pattern both with respect to timing and level of electricity demand for efficient use of energy
- To complement supply side strategies to help licensees avoid or postpone costly capacity (generation, transmission and distribution network) additions by slowing demand growth
- To lower overall cost of electricity to consumers by economical and efficient use of resources
- To reduce environmental damage by reducing emission of greenhouse gases
- To supplement national level efforts for implementation of various DSM schemes set out by the Ministry of Power, Govt. of India
- Strategic efforts to induce lasting structural or behavioural changes in the market that result in increased adoption of energy-efficient technologies, services and practices

Vision of the state government

The DSM vision should be guided by the economic potential for energy and demand savings in the state.

The state is committed to eradicate power shortages and become a leader in providing reliable electric power to its people. Therefore, the state has a vision of saving _ _ _ _ GWh of electricity consumption and _ _ MW of peak electric demand by Year.

This vision of the state is also committed to provide clean environment to its people by translating the envisaged savings to delay _ _MW of generation capacity augmentation through fossil fuels and avoid _ _ thousand tonnes of CO_2 emissions into the atmosphere.

Policy title and enforcement

This policy will be known as the *state demand side management policy Year'* and will be enforced from the date of its notification in the official gazette of the state government. The state government will undertake a review of this policy as and when required in view of any technological breakthrough or any changes taking place in the policy at the national level.

Target for promotion of utility driven DSM at the state level

- 5% reduction in electricity consumption by Year
- 1% reduction in peak electric demand by Year

The baseline for the above mentioned targets shall be the overall electricity sales and average peak electric demand recorded in the last financial year.

DSM obligation

Through this policy, the state, in meeting its energy needs for every control period, would evaluate options to invest in DSM resources, which are cost-effective, reliable, and feasible, along with other resources for electricity supply. However, the investment towards DSM resources may be limited to the available capacity, which shall be guided by the targets notified by the appropriate authority.

Financing of DSM Programs

The Distribution licensees shall avail soft loans through guarantee of the state government to fund the DSM program expenses. Further the distribution licensees shall budget the DSM programme costs (inclusive of the administrative, promotional/marketing and outreach costs) every year in the annual revenue requirement (ARR) and seek the SERC approval to recover the same through consumer tariffs.

Incentive to the state's distribution licensees

For all the DSM investments that materialise beyond the achievement of the target notified in this policy, within the same control period, the Distribution licensees shall be allowed to recover higher return on equity (ROE) from the consumers. This is intended to compensate the perceived loss of return on equity investments of distribution infrastructure, which would have been necessary to accommodate the rising power demand, in the absence of large-scale DSM investments.

DSM investments contribute to efficient use of resources to meet the energy demands of the state. In this regard, the gains or losses derived from the investments in DSM resources shall be treated as controllable and the relevant mechanism approved by SERC for sharing of gains and losses from controllable factors shall prevail.

Apart from this, the empowered committee shall evaluate, at the end of every control period, the impact of DSM investments made by the Distribution Licensees in the state and a consolidated rating shall be published, rewarding top performing utilities for their performance in implementing utility driven DSM programs.

Nodal agency

The state designated agency (SDA) for energy efficiency and conservation will be the nodal agency for facilitating and implementing this policy. The nodal agency shall advise the state electricity regulatory commission (SERC) to notify relevant regulations, in alignment with this policy, and enable the state's distribution licensees to invest in DSM resources. The nodal agency shall undertake a comprehensive load and market research in order to estimate the technical and economic potential for DSM resources in the state. The nodal agency shall facilitate the capacity building of DSM cells within the state owned distribution licensees and ensure that these DSM cells are provided with essential resources to plan, design and implement the megawatt scale DSM programmes. The nodal agency shall also promote capacity building of energy service companies that play a vital role in the value chain of DSM programmes.

Formation of empowered committee

An empowered committee, under the chairmanship of the Principal Secretary, Energy Department, will review and monitor the progress of the state's DSM policy at the end of every control period and take appropriate actions to achieve the policy objectives. The committee may also undertake a review of this policy as and when required in view of any technological breakthrough or any changes taking place in the policy at the national level. The empowered committee will comprise the following members.

- Principal Secretary, Energy Department
- MD, State Designate Agency for Energy Efficiency and Conservation

- CMDs of state's distribution licensees

Roadmap for DSM process and programme implementation

DSM regulations

The SERC shall notify DSM regulations within three months of the date of announcement of this policy in the official gazette of the state government. The DSM regulations shall be in alignment with the state's DSM policy, specify the envisaged loading order, provide the DSM resource acquisition framework and also specify a mechanism that allows the distribution licensees in the state to recover DSM resource costs from the rate payers/consumers.

Constitution of DSM cell

Every distribution licensee in the state shall constitute a DSM cell within one month of adoption of these regulations. The distribution licensee is required to constitute a dedicated team of officials with necessary authority and resources to undertake the functions assigned to it under these regulations.

DSM potential in the state

The nodal agency shall, within one year of the notification of this policy, undertake a comprehensive load and market research in order to estimate the technical and economic potential (indicated in this section) for utility driven DSM practices in the state. The nodal agency may adopt questionnaire based primary surveys to collect relevant information, from various sectors of the economy, in order to understand the load profiles of different consumer categories and capture end-use appliance contribution in the overall load profile. The primary surveys should also capture information required to estimate the market size and penetration factors of proven energy efficiency technologies, appliances, equipment across various end-use applications. Annexure 1 provides a comprehensive list of these proven energy efficiency practices categorised under major sectors of the economy. The nodal agency should also adopt a bottom-up approach and study the load profile, market size and penetration factors separately for various distribution licensees in the state.

The nodal agency shall submit the assessment of technical and economic potential of DSM, studied through load/market research, to the empowered committee within one year of the notification of this policy.

Goal and target setting

The empowered committee shall review the DSM potential within 3 months of submission of the same by the nodal agency. This review may recommend suitable target enhancements, which should be guided by the economic potential for energy/demand savings in the state and also the impact of DSM investments on consumer tariffs. The empowered committee shall make suitable amendments in the state DSM policy to reflect the target enhancements.

Based on the policy amendments published by the empowered committee, the SERC shall make suitable amendments in the DSM regulations for allowing the revision of annual or multi-year DSM targets. The SERC shall be guided by the state's DSM policy targets while setting up such annual or multi-year DSM targets for distribution licensees. The SERC shall also advise the state government in periodic review of targets and suggest revisions if required.

Multi -year DSM planning

The distribution licensee shall formulate and submit to the SERC, a perspective Multi-year DSM plan corresponding to the MYT control period, within six months of notification/revision of DSM goals and target by the SERC.

The plan shall include the following:

- An overall goal for DSM plan guided by the target set by SERC
- Description of DSM programmes, measures, baseline, programme design, incentives, target consumer segment, technology, appliance, marketing strategy
- Implementation mechanism and schedule of each programme in the plan as a whole
- Monitoring and reporting plan of DSM programmes
- Detailed cost effectiveness assessment of programmes

While formulating the Multi-year DSM plan, the Distribution licensee shall be guided by the following guidelines, issued by the SERC. Such guidelines shall be accompanied along with the regulations notified by SERC.

- Guidelines for preparing a Multi-year DSM Plan document - should specify the key elements of the DSM plan and DSM Programme documents to be developed by Utilities
- Guidelines for DSM programme design and implementation mechanisms
- Guidelines for monitoring and reporting of DSM programmes
- Guidelines for evaluation, measurement and verification of the impact of DSM programme implementation
- Guidelines for establishing cost effectiveness of DSM programmes

Review and Approval of multi -year DSM plan

The SERC shall review the multi-year DSM plan submitted by the state's distribution licensees and adopt procedures as specified in the conduct of business regulations for according approval to the DSM plan. While approving the DSM plan, the SERC shall ensure that it is aligned with the state's DSM policy and may direct modifications if required.

DSM plan implementation

The distribution licensees in the state shall implement the DSM programmes in the manner of the DSM plan as approved by the SERC.

Monitoring and reporting of DSM programmes

The distribution licensees in the state shall implement the monitoring and reporting of DSM programmes in the manner of the DSM plan as approved by the SERC.

Verification and evaluation of DSM plan implementation

The SERC shall verify and evaluate the impact of the DSM plan implementation at the end of every control period. The SERC can engage an independent third party for undertaking this task. The distribution licensee shall make available necessary information or data to the SERC or third parties assigned by the commission to measure and verify the savings from DSM programmes.

Review and assessment of DSM targets

Before the beginning of every new control period, the SERC may revise the DSM targets and goals set for the state's distribution licensees if deemed necessary and should ensure the alignment of targets with the state's DSM policy.

Funding the activities of nodal agency

Option 1: The SERC shall introduce a DSM surcharge for the selected consumers in the state and the revenue collected shall form a revolving fund which shall be managed by the nodal agency to implement this policy.

Option 2: The nodal agency shall utilise the State energy conservation fund to finance all the activities required to implement this policy.

The nodal agency shall use this fund for undertaking load/market research to study the DSM potential in the state after every control period. The nodal agency shall also use this fund to undertake capacity building activities and reward distribution licensees for achieving the targets.

Annexure 1

Description of DSM programmes	
Residential programmes	
Refrigeration	Provide incentives (rebates) for the purchase of BEE star rated (>3) refrigerator
Air conditioning	Provide incentives (rebates) for purchasing BEE star rated (>3) air conditioners, installing direct load control devices on air conditioners, or home insulation systems
Lighting and ceiling fans	Provide incentives (rebates) to purchase BEE star rated (>3) CFL, T8, T5 lamps with electronic ballasts Incentives for purchase of LED based lighting systems Incentive for purchase of BEE star rated (>3) ceiling fans
Water heating programmes	Designed to offer: • Rebates/incentives to install solar water heaters • Rebates to install jackets and low-flow, shower heads or high efficiency water heaters • Direct load control of water heaters • Water heating storage for load shifting
Comprehensive building	Provide incentives (rebates) to builders and architects to incorporate energy efficient technologies into new building construction, energy audits to customers and incentives to incorporate energy saving technologies recommended
Time of day rates	Offer time of day pricing to encourage residential customers to shift usage to off-peak periods
Off grid renewable energy applications	Designed to offer: Rebates/incentives to install captive solar PV systems and other reenwable energy applications
Commercial programmes	
Refrigeration	Provide an incentive to replace existing compressors and motors with high efficiency models
Commercial heat/ vent/ AC	Offer incentives: • To replace existing fan and pump motors with high efficiency units • For installing commercial office building and retail building cool storage systems • To install office building economiser controls • To install thermal energy storage systems
Lighting	Offer incentives (rebates) to upgrade existing fluorescent bulbs and fixtures with high efficiency lights and electronic ballast
Comprehensive building	Offer: • Time of day rates • Energy audits to customers and incentives to incorporate energy saving technologies recommended
Water heater	• Rebates/incentives to install solar water heaters • Provide a water heater wrap and installation through an independent contractor
Time of day rates	Offer time of day pricing to encourage commercial customers to shift usage to off-peak periods
Off grid renewable energy applications	Designed to offer: Rebates/incentives to install captive solar PV and thermal systems
Industrial programmes	
Motor programme	Provide an incentive to replace standard efficiency motors at time of failure

	with high efficiency motors
Lighting	Offer incentives (rebates) to upgrade existing fluorescent bulbs and fixtures with high efficiency lights and electronic ballast
Comprehensive building	Includes energy audits and various energy efficiency improvements, motor programs and industrial water heater programmes
Time of day rates	Offer time of day pricing to encourage industrial customers to shift usage to off-peak periods
Miscellaneous	Provide incentives for installing high efficiency fans, blowers, compressed air systems, variable speed drives
Off grid renewable energy applications	Designed to offer: Rebates/incentives to install captive solar PV and thermal systems
Agricultural programmes	
Pumping system	Provide incentives for installing high efficiency pumping systems that include motors, pumps, high efficiency foot valves, replacing GI pipes to PV pipes, impeller retrofits, variable speed drives etc. Provide incentives for installing solar powered pumping systems
Municipal water pumping programmes	
Pumping system	Provide incentives for installing high efficiency pumping systems that include motors, pumps, impeller retrofits, variable speed drives, changing pumping schedules to off peak periods etc.
Municipal street lighting programmes	
Street lighting	Provide incentives for installing high efficiency street lighting systems, smart controls, etc.

Closing statement

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