

AEEE Comments on Draft Demand Flexibility and DSM Regulations Published by MERC

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About AEEE

Alliance for an Energy Efficient Economy (AEEE) is India's foremost energy efficiency policy support and market enablement not-for-profit organisation. AEEE advances energy efficiency as a resource and provides policy and implementation support to catalyse responsible energy use for a climate-resilient and energy-secure future. We collaborate with government, industry, and civil society organisations and drive policy research, innovation, and on-ground impact, targeting national and state-level energy savings and greenhouse gas emission reductions. Our three organisational goals to foster an efficient and equitable energy transition are - enabling 100 GW of demand offset, facilitating INR 1,00,000 crore in green investments, and empowering 500K+ green professionals for India's net-zero goals. We are committed to supporting India's 2030 Nationally Determined Contributions (NDC), Kigali amendment to the Montreal Protocol, and the UN Sustainable Development Goals (SDG) 2030.

AEEE believes that a decarbonizing the power sector substantially will require building enough flexibility in power system to match supply and demand. The Smart and Resilient Power and Mobility vertical at AEEE has developed frameworks to help utilities integrate demand-side strategies and create a resilient energy system that supports the transition to a low-carbon economy. Some of the recent and ongoing works at the SRPM vertical include research on catalysing the demand flexibility market in India, creating standards for demand response ready appliances, analysing behavioural demand response in the residential category of consumers and accelerating utility-driven demand side management programmes.

Background and Highlights of the Regulation

The Maharashtra Electricity Regulatory Commission issued Draft MERC (Demand Flexibility and Demand Side Management – Implementation Framework, Cost-effectiveness Assessment; and Evaluation, Measurement and Verification) Regulations, 2024, and invited comments from the public.

The electricity requirement in Maharashtra is expected to rise to 250-290 terawatt hours (TWh) by 2029-30 [1]. To meet this requirement, Maharashtra would need a cumulative procurement of 107-125 TWh/BU of renewable energy by FY 2030 [2]. As renewable generation depends on weather conditions (like sunlight and wind) and is highly intermittent, a high share of renewables in the generation mix can create a potential supply-demand mismatch, causing grid imbalance or unpredictable price fluctuation. There, demand side management (DSM), particularly demand flexibility (DF), can quickly aid in shaping demand profiles to better match the generation profiles by allowing electricity demand to respond to grid conditions strategically. To meet growing demand reliably, a substantial increase in demand-side management and storage capacity will need to be secured in the coming years.

We commend MERC for its proactive approach to promoting demand-side management, particularly demand flexibility. These regulations offer a framework for Maharashtra's DISCOMs to engage in demand-side management and effectively manage electricity demand while integrating the increasing share of renewable energy in the grid. In the long term, demand flexibility can potentially contribute to Resource Adequacy (RA). Hence, this regulation is a much-needed and welcome step. On behalf of its members, AEEE would like to submit the following comments on the draft regulations (highlighted in green).

Comments and Suggestive Recommendations

Primary Recommendations

1. Definition of Demand Flexibility

The draft highlights demand flexibility as the ability of the demand-side load to vary their consumption to help integrate a higher share of renewable energy. However, another crucial application of demand flexibility worldwide is managing peak demand and offering demand reduction capacity to utilities during periods of urgency.

Therefore, we suggest the change in the definition of demand flexibility in clause 2.1.6 of the draft:

"Demand Flexibility" means the capacity of demand-side loads that can vary their consumption patterns hourly or on another timescale **in response to system conditions (such as price, stability, and reliability) as determined by the licensee** to help integrate higher amounts of renewable energy, **and managing electricity demand (peak or otherwise)** resulting in making electricity more affordable to consumers with the co-benefits of reducing or deferring system costs.

Furthermore, we recommend that regulations should clearly state that diesel generators (DGs) should be ineligible for participation in demand flexibility measures.

2. Definition of Consumers and Aggregator

2.1 The draft does not define consumers eligible for participating in demand flexibility. Therefore, we suggest defining the demand flexibility of eligible consumers in the draft as:

“An entity that participates in a demand flexibility programme, utilises, supplies, installs, procures, or commissions equipment to provide demand flexibility services.”

2.2 We also suggest **adding the demand aggregator definition in the draft**. The aggregator shall be defined as:

“An entity that aggregates and represents a portfolio of customers for the purpose of providing flexibility services through an agreement.”

3. Database of Demand Flexibility Consumers/Load and DF Assets

3.1 Database of DF Consumers:

In clause 4 (e), related to **DF/DSM Guiding Principles**, the draft mentions that the Demand Flexibility programmes shall also include Demand Response initiatives involving consumers agreeing to modulate their load shapes through a contract with the licensee.

We suggest regulations to inform the licensee to obtain written consent from customers enrolling to provide a DF service and maintain a database of consented customers to avoid double counting of the DF Resource during the term of its agreement with the licensee/provider. Therefore, we suggest the following change to clause 4 (e) of the DF/DSM Guiding Principles:

The Demand Flexibility programmes shall also include Demand Response initiatives involving consumers agreeing to modulate their load shapes through a contract with the licensee/aggregator. The licensee/aggregator shall obtain written consent from customers enrolling to provide a demand flexibility service and maintain a database of consented customers, and flexible load to avoid double counting of the DF Resource during the term of its agreement with the licensee/aggregator.

The location, size, and type (e.g. fast/slow response) to be mapped for all the assets across the distribution network for better visibility and awareness.

Additionally, the license shall update the database in case of new flexible load and maintain such database through a web-portal. Consumers can apply with their new flexible load in the portal. The distribution Licensees shall share the database with regulators and other stakeholders whenever requested.

4. Incentive for Participating Licensees

Clause 4 (d), related to DFPO incentives and disincentives, mentions that the Distribution Licensee shall be eligible for an incentive of INR 0.20 Crore for every MW achieved in excess of DFPO. Similarly, the Distribution Licensee shall be subjected to a disincentive of INR 0.20 Crore for every MW underachievement of DFPO.

- a. It is unclear how the incentive of INR 0.20 Crore per MW is determined. Does it also factor in the reduction in transmission infrastructure requirements, or is the value determined on the basis of distribution network avoidance?
- b. While the proposed incentives and disincentives for achieving Demand Flexibility Portfolio Obligations (DFPO) are a step in the right direction, consider **introducing tiered incentives that reward higher performance levels**. This could motivate distribution licensees to exceed basic

compliance.

- c. What kind of **accountability mechanisms will be in place** for distribution licensees that fail to meet these targets?

5. Residential ACs for Demand Flexibility

Clause 4 (e), related to DF/DSM portfolio deployment in key sectors, outlines several strategies for demand flexibility but does not specifically include **residential ACs**. According to projections by Prays Energy Group, the residential air conditioners (ACs) stock in Maharashtra is expected to increase from 5.2 million units in 2024 to 40.5 million units in 2041[3]. Therefore, residential air conditioners should be a key focus in the demand flexibility strategy, especially in managing peak electricity demand. In line with our suggestion, we suggest the following changes in the draft:

DF/DSM portfolio deployment in key sectors: Distribution Licensees shall implement programmes that add to the structures of resource adequacy and those that include demand flexibility to provide quick ramp-up and ramp-down services, reduce peak demand and associated costly power purchase, specifically in the urban centres and embedding cheaper renewable energy available within and from outside of the distribution licensee area of supply. The Demand Flexibility programmes shall also include Demand Response initiatives involving consumers agreeing to modulate their load shapes through a contract with the licensee. Given the new loads that are now experienced by the Distribution Licensees, the programme basket proposed and implemented through these Regulations shall include, but not be limited to, the following:

- a) time-based and selective pumping (based on the cost of energy) in Lift Irrigation Schemes, Municipal Corporations, Urban Local Bodies, Nagar Parishads, drinking water schemes at villages and cluster of villages;
- b) smart charging of electric vehicles in the 2-wheeler, 3-wheeler, passenger cars, fleet vehicles, public transportation buses, freight carriers, first-mile and last-mile delivery vehicles;
- c) behind-the-meter battery energy storage systems;
- d) heat pumps in residential, hospitals, hotels, industries, commercial buildings;
- e) thermal energy storage systems in residential, hospitals, hotels, industries, commercial buildings;
- f) heavy load appliances in the residential sector, like air conditioners.

6. Consumer Representation in DF/DSM Consultation Committee (DSM-CC)

In clause 5, related to the DF/DSM Consultation Committee (DSM-CC), the draft mentions that a separate DF/DSM Consultation Committee shall be set up under these Regulations through a specific notification of the Commission with a stated tenure and terms of reference. The DF/DSM Committee shall be a group of experts working under the direction of the Commission to review and provide suggestions and objections on the DF/DSM programme portfolio submitted by the distribution licensees and recommend its findings on DF/DSM Programmes to the Commission for approval. Secretary to the Commission shall act as the Convenor of the DF/DSM Committee with participation from distribution licensees, Maharashtra Energy Development Agency (MEDA) representing the Bureau of Energy Efficiency (BEE), Chief Electrical Inspector, sectoral experts including representatives of

academic/research institutions and private sector with specific knowledge of DF/DSM opportunities. The DF/DSM Consultation Committee shall evaluate the “DF/DSM Programme Portfolio and Implementation Plan” submitted by the distribution licensees and provide its recommendations to the Commission, and assist in the evaluation of the “Status report on DF/DSM implementation” submitted by licensees. The DF/DSM Committee shall also assist in the creation of sectoral expertise in the stakeholder groups to actively guide the design, implementation and evaluation of DF/DSM programmes.

In the current draft, consumer participation must be added to the committee. The committee should also ensure that consumer voices are included in the planning and implementation phases. Therefore, we recommend the following changes:

A separate DF/DSM Consultation Committee shall be set up under these Regulations through a specific notification of the Commission with a stated tenure and terms of reference. The DF/DSM Committee shall be a group of experts working under the direction of the Commission, to review and provide suggestions and objections on the DF/DSM programme portfolio submitted by the distribution licensees and recommend its findings on DF/DSM Programmes to the Commission for approval. Secretary to the Commission shall act as the Convenor of the DF/DSM Committee with participation from distribution licensees, Maharashtra Energy Development Agency (MEDA) representing the Bureau of Energy Efficiency (BEE), Chief Electrical Inspector, sectoral experts including representatives of academic/research institutions and private sector with specific knowledge of DF/DSM opportunities. **The committee shall also ensure that consumer voices are included in the planning and implementation phases.** The DF/DSM Consultation Committee shall evaluate the “DF/DSM Programme Portfolio and Implementation Plan” submitted by the distribution licensees and provide its recommendations to the Commission, and assist in the evaluation of the “Status report on DF/DSM implementation” submitted by licensees. The DF/DSM Committee shall also assist in creation of sectoral expertise in the stakeholder groups to actively guide design, implementation and evaluation of DF/DSM programmes. **The terms of reference for such a committee will be prepared by the commission.**

7. Evaluation, Measurement and Verification

In clause 13, related to Impact Evaluation, the draft mentions that impact evaluation shall primarily be carried out using either of the three approaches:

1. Measurement & verification approach;
2. Deemed savings approach; and
3. Large-scale data analysis

The draft also mentions using the Deemed Savings approach, where savings are reported based on historical values from typical DSM projects. However, savings can vary significantly on a daily basis across different DSM projects, meaning these reported savings may need to reflect actual project outcomes accurately. The draft mentions analysing savings through a time series analysis in a large-scale data analysis. However, a time series analysis typically requires a substantial amount of data, and with sufficient data, the impact evaluated using this method may be accurate. In this scenario, we have the following question:

1. In **which scenario** would a deemed saving approach and large-scale data analysis be applicable? Could you **provide an example** of this?
2. The option to be exercised in **order of priority** based on the **associated costs and efforts**.

Secondary Recommendations

8. Other Comments

8.1 Relying More on Sub-Metering Instead of Primary Survey

In clause 14, related to Process Evaluation, the draft mentions that the primary instrument used in the process evaluations shall be data collection (e.g., surveys, questionnaires, and interviews) from administrators, designers, participants (such as facility operators), implementation staff (including contractors, subcontractors, and field staff), and key policymakers. Other key elements of a process evaluation shall be workflow and productivity measurements; reviews, assessments, and testing of records, databases, programme-related materials, and tools; and collection and analysis of relevant data from third-party sources (e.g., equipment vendors, trade allies).

The data collection through primary surveys is often influenced by social desirability bias, enumerator bias, and limitations in long-term memory. Therefore, we recommend increasing sub-metering instead of relying heavily on primary surveys.

8.2 Calculation of Demand Flexibility Portfolio Obligation

In clause 4 (c), related to **DFPO multi-year targets**, draft mentions that the distribution licensees shall adhere to specific demand flexibility portfolio obligations (DFPO). The draft specifies demand flexibility portfolio obligations starting at 3% of the peak demand from the previous financial year for FY 2025-26, equivalent to 660 MW. **However, it is unclear how the 3% is determined.**

Year	DFPO as the percentage of peak demand experienced in the previous financial year	DFPO Capacity (in MW)
FY 2025-26	3%	~660 MW

Contributors to this draft

1. Sumedh Agarwal
2. Pramod Kumar Singh
3. Paras Bhattarai

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Office Address:

37 Link Road, Ground Floor, Lajpat Nagar III

New Delhi-110024, T.: +91-11-41235600

E.: info@aeee.in W.: www.aeee.in