



## AERC (Demand Response) Regulations, 2024 [Draft]

The AERC Demand Response (DR) regulation aims to integrate DR into regular distribution operations to improve efficiency, manage load, reduce costs, and facilitate renewable energy integration. It promotes dynamic pricing, network reliability, congestion relief, and participation in ancillary services. Guidelines issued by the Commission ensure the design, implementation, evaluation, and monitoring of DR programs, emphasizing cost-effectiveness, data protection, and robust database systems.

### Objectives of AERC Demand Response (DR) Regulation:

1. **Integration into Distribution Operations:** Incorporate DR into the daily activities of Distribution Licensees to enhance efficiency and asset utilization.
2. **Load Management and Environmental Benefits:** Promote load shifting, reduce seasonal peaks, address power shortages, and lower greenhouse gas emissions.
3. **Cost Efficiency:** Decrease reliance on short-term power procurement and lower overall electricity costs.
4. **Dynamic Pricing:** Introduce Time-of-Use tariffs and other mechanisms to encourage energy-efficient consumption.
5. **Network Security and Reliability:** Improve network security while ensuring a balance between electricity supply and demand.
6. **Network Congestion Relief:** Mitigate congestion in the distribution network.
7. **Participation in Ancillary Services:** Enable consumers and aggregators to contribute to ancillary services through DR programs.
8. **Renewable Energy Integration:** Facilitate the smooth integration of renewable energy sources and distributed generation into the grid.

Additionally, DR participants may qualify to contribute to secondary and tertiary reserve ancillary services.

### Key Guidelines for Demand Response Implementation:

The Commission issue directives for Distribution Licensees to ensure effective execution of DR activities, including:

- a) **Design and Development:** Establish DR programs tailored to system needs.
- b) **Implementation:** Define methodologies for energy consumption measurement and demand reduction validation.
- c) **Cost Effectiveness:** Assess the financial feasibility of DR initiatives.
- d) **Evaluation and Verification:** Measure and verify program outcomes.
- e) **Monitoring and Reporting:** Ensure comprehensive program oversight and transparent reporting.
- f) **Customer Data Protection:** Safeguard consumer information.
- g) **Database and Systems:** Develop data frameworks and systems to support DR operations.

The document can be accessed [here](#)

### CER opinions



1. **Qualifying Criteria for Aggregators:** In the Clause 2.1(b) definition of the aggregator is given as ““Aggregator” is an entity registered with the Distribution Licensee to provide aggregation of one or more of the services like demand response services under the demand response mechanism, Distributed Generation, Energy Storage etc. within a control area;”

The regulation mandates registration of the Aggregators with the Distribution. There should be an online registration process for the same. The regulation should set clear qualifying criteria for the aggregator so as to avoid potential disputes. **The qualifying criteria may include** the following:

- Minimum net worth
- At least one employee with technical background, especially qualified energy manager or, one with electrical engineering background with adequate training in regulatory aspects
- Adequate IT and metering capabilities for real-time monitoring
- Conflict of interest declaration – with reference to the relationship with employee of the Distribution Licensee and the entity managing power procurement on behalf of the Distribution Licensee<sup>1</sup>

The registration process including qualifying criteria, registration fee, registration timeline, conditions for revoking registration, reporting requirement including format thereof, format for application, dispute resolution mechanism, required IDs, certifications etc. Furthermore, **a compliance mechanism, especially in terms of reporting requirement**, should be clarified upfront and be strictly followed. Clarity on these aspects will ensure a transparent and efficient role of aggregators in the demand response program across the state.

All details for the registered aggregators along with key qualifying criteria and status of registration should be uploaded on the Distribution Licensee’s website. **Report on monthly activities of the Aggregators should also be archived and accessible from the Distribution Licensee’s web portal.**

2. **Definition of Control Area:** In the clause 2.1 (b) “Aggregator” is an entity registered with the Distribution Licensee to provide aggregation of one or more of the services like demand response

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<sup>1</sup> This is ensure that selected aggregators are not unduly favoured by insider/advance information or in terms of deployment of DR services.



services under the **demand response mechanism, Distributed Generation, Energy Storage etc. within a control area;**” (emphasis added)

For a distribution licensee, a “Control Area” typically refers to a specific geographical region, often corresponding to district boundaries. It seems that the regulation may be referring to the licensee area rather than control area. If so, appropriate correction may be made.

- 3. Compliance mechanism for Services Offered by the Aggregators:** The distribution licensee should also have a credible and effective compliance mechanism vis a vis the aggregators. In case of deviation from schedule, the suppliers of electricity face consequences under the Deviation Settlement Mechanism. Similarly, in case of the services offered by the aggregators, a compliance mechanism must be in place. This can be embedded as a part of the contractual agreement or be designed to be an integral part of the pricing/incentive mechanism.

For instance, if a DL seeks 10 MW demand reduction during identified time blocks and the aggregator, who has committed to provide that service, falls short of its commitment. This has consequences in terms of higher cost, or unserved energy to consumers (in this case) and thus reduction in its standard of performance targets.

- 4. Ensuring Compliance by Third Party:** In the clause 3.2, “*The Licensees shall ensure that aggregator and/ or other third parties involved in demand response program comply with these Regulations through appropriate conditions in the respective contracts.*” (emphasis added)

Who are the ‘other’ third parties? Third party may include an IT service provider, an entity supplying/installing special meters, or the consumer (?) etc. The licensee may not be able to ‘ensure’ compliance with the provision of the regulations, but it can include a mechanism, with adequate penalty, to seek its compliance. However, this would also require that the regulation itself has a penal mechanism for non-compliance by the licensee.

The compliance mechanism should include a reporting framework for the aggregators. This should be in line with the reporting framework to be prepared by the Commission for the licensee vis a vis services to be offered by the aggregators.

## **5. Pricing Mechanism for DR Services:**

The regulations do not provide any guidance on the mechanism for pricing of DR services to be provided by the aggregators. While this would be a ‘commercial’ decision by the licensee, a guiding framework can help meet the objective of peak demand reduction in an economical manner. We suggest that, subject to an effective compliance mechanism, **compensation/pricing mechanism for DR services delivered by an aggregator should be linked to the prevailing market price** (i.e. short-term avoided cost for the distribution licensee). This would ensure that there are correct pricing signals for the distribution licensee as well as the aggregators.

The DR mechanism should generate net savings in the power procurement cost. One third of additional

saving, beyond the cost reduction under the demand response target, may be provided as an incentive to the distribution licensee. In its absence, compliance towards provision of DR services would be weakened. An incentive mechanism may also be put in place by the distribution licensee for consistent and reliable delivery of DR services by an aggregator.

6. **‘Market Access’ – Locking up Consumers with an Aggregator:** An aggregator may need to install metering and communication systems on the premises/equipment of, say, specific C&I consumers. To avoid lock-in of the consumer to a single aggregator<sup>2</sup>, the regulation should provide for easy switchover by specifying a limit for removal of the existing metering/ communication system in a time bound manner, else the consumer should have the right to get it replaced by another aggregator’s metering/communication system. In its absence, the market for DR services would be characterized by an ‘entry barrier’ thus reducing competition thereof.

To ensure that the aggregators do not impose restrictive conditions or impeded/delay switchover to other aggregators, the regulation should ensure that such switchover is smooth and, if required, the communication/control equipment of the existing aggregator are either removed or handed over (as per pre-defined terms) to the consumer in a time bound manner. Clearly defining these terms and conditions is crucial to prevent potential disputes in the future.

7. **Demand Response Target Setting:** In the clause 6.2 *“The Commission shall review and establish DR targets based on DR potential assessed by the distribution licensees such as % reduction in overall demand, % reduction in peak demand, % reduction in peak demand in different seasons, % reduction in short term power procurement for DR, etc. within 3 months from submission of the DR potential assessment report by the distribution licensee.”*

It is suggested that **target setting for the DR should be avoided in the very beginning** and such target setting should not just be based on post submission of a Detailed Project Report (DPR) but should consider **experience from a broad based DR pilot targeting various consumer categories**. The Commission should set a clear timeline for completion of DPR and pilot. In case of any delay in doing so, the Commission may proceed with setting a DR pilot thus ensuring that any laxity on this part does not lead to delay in setting DR target. **The targets set should be measurable and have a compliance mechanism in place.** To ensure that there is overall economics in achieving those targets, it would be prudent to adopt an **overall DR target**, especially in terms of cost reduction through DR, and **avoid setting service-specific target**, unless required due to the differentiated services that does not have a common metrics of measurement. Some of the alternate targets may be on the basis of:

- Reduction in peak demand (in MW) – by demand reduction or through discharge of storage
- Reduction in need for short-term power procurement
- Saving in power procurement cost during deployment of DR
- Avoided additional cost of new distribution assets/infrastructure<sup>3</sup>

<sup>2</sup> A consumer may wish to switchover to another aggregator due to lack of sufficient incentives/revenue sharing or a dispute between the consumer and the existing aggregator.

<sup>3</sup> This is difficult to measure and may be a long-term objective, rather than a specific target.



Target setting for DR includes setting a baseline, this would require seamless collection of data by the Distribution Licensee and its analysis. Institutional mechanism should be put in place to ensure that such high frequency data is compiled across targeted consumers and is also available for research to estimate appropriate baseline and DR potential. A provision for the same be incorporated in this regulations.

## 8. DR Target and Resource Adequacy:

CER, IIT Kanpur pointed out in numerous submissions that demand response (DR) can and should play a role in assessment of resource adequacy by the distribution licensees<sup>4,5,6,7</sup>. DR can help postponement of the capacity additional/capacity contracting, especially for thermal power generation and/or storage services thus economising on cost of power procurement.

To the extent that the distribution licensee would be able to reduce peak demand due to DR, it would result in lower resource adequacy requirement and, thus, should be reflected in **‘updated’ resource adequacy projections for the projection horizon.**

## 9. Timeline to assess Demand Response Potential: In the clause 6.1 “Distribution licensees shall assess the DR potential before 9 months of the start of the control period and submit DR potential assessment report to the Commission;

*Provided that for the next control period (FY 2025-26 to FY 2027-28), the distribution licensees shall assess the DR potential for FY 2026-27 and FY 2027-28 within 6 months from the date of notification of these regulations and submit DR potential assessment report to the Commission.”*

Assessment of demand response potential is a time taking task and must also be accompanied with pilots to assess implementation challenges and address the same. It may be difficult to assess the DR potential in a short-period of 6 months as DR needs to access across the year. Being a first time initiative, the regulation should provide for adequate time for the first DPR on DR potential. If these regulations are notified within next 1-2 months, a period of 10-12 months may be provided for undertaking a meaningful assessment of demand response potential. Thorough analysis for a year, would allow the distribution licensee, to gather and analyse data across all the seasons throughout the year, enabling them to identify patterns, peak demand periods, and the specific scope for DR initiatives within their control areas.

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<sup>4</sup> Singh et al. (2019), *Regulatory Framework for Long-term Demand Forecasting and Power Procurement Planning*, CER Monograph, Book ISBN:978-93-5321-969-7, [https://cer.iitk.ac.in/assets/downloads/CER\\_Monograph.pdf](https://cer.iitk.ac.in/assets/downloads/CER_Monograph.pdf)

<sup>5</sup> Detailed studies have been undertaken for the states of Uttar Pradesh and Chhattisgarh, incorporating long-term demand forecasting as well as power procurement panning.

<sup>6</sup> TNERC (Framework for Resource Adequacy) Regulations, 2024 [Draft], 2024, <http://www.tnerc.gov.in/Orders/files/TO-MP%20No%201140820240436.pdf>

<sup>7</sup> CEA: *Draft Guidelines for Resource Adequacy Planning Framework for India*, 2023 (PC-5(3) of 2023), [https://cer.iitk.ac.in/blog/new\\_blog/?id=MTg2NA==](https://cer.iitk.ac.in/blog/new_blog/?id=MTg2NA==)



Demand response is a relatively short-term strategy to ensure resource adequacy. Due to dynamic demand supply as well as market scenario, a reliable estimate of the DR potential may not be feasible on a multi-year ahead basis. DR potential depends on the load growth, flexibility with consumers, penetration of storage and efficient devices as well as incentive for DR. These can be assessed more reliably with a near-term horizon. **The regulation should thus provide for annual updation of the DR potential.**

**10. Implementation of Pilot Demand Response programs:** In the clause 9.5 *“The Distribution Licensee shall design, develop, and implement few pilot DR programs targeting different consumer categories having smart meter installed till the complete baseline data is available for its area of supply. Establishment of baseline data shall not be a pre-requisite for design of such initial pilot DR Programs by the Distribution Licensee.”*

**Setting baseline** for the underlying parameters, for example demand profile across a day (across months/seasons), is **the most important design aspect of a demand response program**. The regulation should provide a framework for setting the baseline. Furthermore, timeline for committing to demand response and its actual deployment also determines if the ‘actual’ reduction in demand has been achieved. **In case of a poorly designed baseline, and the deployment framework, the distribution licensee may likely be paying for ghost demand response.**

It is essential that these pilot DR programs include a Cost-Benefit Analysis (CBA) to evaluate economic viability of the schemes. A thorough CBA will help in understanding not only the financial implications but also the potential benefits in terms of demand reduction, peak load management, cost reduction, avoided cost of infrastructure and overall grid stability.

Furthermore, ongoing monitoring and evaluation of the pilot programs will be crucial for refining the DR initiatives based on actual performance data. This process will enable DISCOMs to adjust their strategies and enhance the effectiveness of future DR programs. **Report of the pilot programs as well as annual performance of aggregators should be available in public domain for stakeholder knowledge and feedback.** This would also be the knowledgebase for DR implementation across the country.