Prayas (Energy Group)'s comments on MPERC (Framework for Resource Adequacy) Regulations, 2023

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Prayas (Energy Group)

Madhya Pradesh Electricity Regulatory Commission issued draft (Framework for Resource Adequacy) Regulations, 2023 on 13th September, 2023 and invited comments from the public by 6th October 2023.

We commend MPERC for taking the initiative to be the first Commission in the country to publish draft regulations for Resource Adequacy (RA). These regulations provide a framework for MP DISCOMs to plan their investments as well as power procurement in a cost-optimal manner taking cognizance of available technologies as well as changes in demand. Hence, this is a welcome step in the right direction.

With this context in mind, Prayas (Energy Group)'s comments on the regulations focus on process related aspects and lack of clarity regarding specific proposals, as detailed below.

1. **Need for capacity building and a trial period (1-2 years) without penalties for non-compliance:** RA studies are rather complex and time consuming to undertake and there needs to be an initial period during which these methods are fine-tuned and capacity building of the various institutions involved is undertaken.
   In this context, it is imperative that there be a trial period of a few years for the RA framework specified by CEA, and that RA targets are not binding during this trial period[1]. Specifically, penalties should not be imposed for non-compliance with specified targets during this period. Without such a cautious approach, RA requirements may not result in cost-optimal investments, and instead may result in long term, base-load contracting with associated inefficient resource lock-ins.

2. **Treatment of demand-side resources:** Demand side resources have been considered in the demand forecasting and hence are baked into the demand. However, some demand side resources such as demand response are available for balancing the system, and hence should be considered similar to generation resources in resource adequacy studies. CEA's resource adequacy guidelines also state that methodologies similar to determination of capacity credits for renewable resources should be employed to determine the value of demand response resources. Hence section 2.1 could be re-drafted as
   2.1. The objective of these Regulations is to enable the implementation of Resource Adequacy framework by outlining a mechanism for planning of generation ***and demand*** *resources for reliably meeting the projected demand in compliance with specified reliability standards for serving the load with an optimum generation mix.*

[1] This is also highlighted in a 2021 paper assessing IRP processes and RA frameworks in the North Western Power Pool of the United States. The paper titled, "Implications of a regional resource adequacy program for utility integrated resource planning" states that:
"Ultimately, interviewees from public utility commission staff from SPP states indicated that LSEs have an incentive to develop IRP assumptions that are consistent with SPP's in order to fulfill their membership duties. IRP guidelines in these states are generally much broader and more flexible than the IRP rules in Western U.S. states. This flexibility makes it easier for LSEs to adapt their IRP analyses to align with SPP requirements. LSEs should be able to develop NWPP-aligned forecasts as part of their IRP processes and benefit from the public stakeholder engagement as long as IRP regulations in the NWPP states are based on a broad and flexible set of principles."
More details here: https://www.sciencedirect.com/science/article/pii/S1040619021000518

Similar addition could be made in section 5.2

3. Methodology to determine capacity credits: The method for calculating capacity credits does not take into account dynamics that affect the value of certain technologies. Two aspects merit attention. One, certain resources have diminishing capacity credit as their penetration increases. For example, solar capacity may have a certain value in a system where there is a day-time peak. However, each additional megawatt of solar added to the system may have diminishing value. This may be particularly relevant when making decisions for a longer period like ten years. The second aspect is the impact of one resource on the capacity credit of other resources. For example, in a solar heavy system, additional solar capacity is likely to have a low-capacity value. However, addition of storage resources can result in a higher capacity value for solar. Thus, capacity values need to be calculated with different combinations of capacities of different technologies. Methodologies such as those based on the Effective Load Carrying Capability (ELCC) metric can be effective in determining capacity credits for combinations of different technologies[2].

4. Capacity credit for hydro resources: In clause 9.4, it is stated that "CC factors for hydro generation resources shall be computed based on water availability with different CC factors for run-of-the-river hydro power projects and dam-based/storage-based hydro power projects". Can it be elaborated how capacity credit is to be calculated for hydro power projects given that past data for storage-based hydro power projects would reflect dispatch decisions made by the LDC? On the other hand, should capacity credit for run-of-the-river hydro power projects be calculated in a manner similar to variable renewable resources given that they are usually not dispatchable?

5. Resolution of the RA studies: The resolution of the RA studies is specified as hourly, and sub-hourly where data is available. It is important to note that hourly resolution will not be sufficient to capture the impact on the system due to variability in demand and variable RE generation. For example, a coal generator with a ramp rate of 1%/min can ramp up or down by up to 60% of its installed capacity in an hour which is its entire capacity above technical minimum. Thus, an hourly simulation cannot capture the ramp constraints that are seen in a real system. A resolution of 15 min or higher should be considered in studies where operational constraints such as ramp rates are being considered, such as dispatch simulations.
   For example, Section 7.1 could be redrafted as, *'MPPMCL shall develop a methodology for hourly* ***and*** *sub-hourly* ***(15 min block wise or whichever is the smallest time block for energy accounting and settlement)*** *demand forecasting and shall maintain a historical database.*
   Similar changes could be made in all sections where the reference or the hourly/sub-hourly time frame is mentioned.

6. Leveraging wider sector expertise in the country: There is significant expertise on the Indian power system within think tanks, research groups and civil society organisations. These groups routinely engage in various policy and regulatory processes and share their inputs and expertise in many forums. Hence, the various processes under the resource adequacy

[2] Application of ELCC in RA studies is explained in the paper titled "Capacity and Reliability Planning in the Era of Decarbonization - Practical Application of Effective Load Carrying Capability in Resource Adequacy", available at https://www.ethree.com/wp-content/uploads/2020/08/E3-Practical-Application-of-ELCC.pdf

regulations should include this set of stakeholders that represent the larger public. For example, the consultation specified in clause 23 should be a public consultation.

Section 23 could be re-drafted as
23. Assessment to involve consultation
The MPPMCL shall make the Resource Adequacy Plan in consultation with State Sector Generating Companies, Distribution Licensees, Central Sector Generating Companies, Transmission Companies, National / Regional /State Load Dispatch Centers, ***research agencies with relevant experience*** *and Central Electricity Authority. It may also make enquiries with the Trading Companies and States with surplus power to estimate the likely availability and price of power across the country for peak, off-peak and normal periods.* ***Further, MPPMCL shall publish their draft RA Plan along with relevant data used in the modelling study for public consultation and finalise it only after taking into consideration public comments. The period for public consultation should be for a minimum of 3 months given the complex nature of the exercise.***

7. Transparency: The data that is mandated to be shared as per formats specified in Annexure II should be made public since these decisions affect the public at large. Such transparency also enables various stakeholders to provide informed inputs and contribute constructively to the resource planning process. Without access to the relevant data, the results of the any study will only appear as a black box model which cannot be critically examined or replicated. Prayas (Energy Group) has been conducting power sector modelling and our entire Maharashtra model is available in the public domain here (https://github.com/prayas-energy/gridpath-mh).

8. Preparation of Generation Resource Planning
Section 8.3 (d) can include
    a. Start-up time and costs.

9. Section 11.11 notes that *'MPPMCL shall keep the share of Long-term contracts in the range of 75-80% of the RAR and Medium–term contracts in the range of 10% - 20% of the RAR while the rest to be met through Short-term contracts.*
    a. *Provided that power procurement through Day-Ahead Market (DAM), shall not be considered towards the contribution for meeting RAR'.*

The Power Exchanges are likely to come up with up to 11-month contracts under Term Ahead Market (TAM). The regulations should clarify how procurement under TAM segment (week, month and 11 month ahead) would be treated.

10. Section 13.8. notes that, *'MPPMCL shall contract storage capacity corresponding to the results of LT- DRAP capacity addition requirement for future years from Battery Energy Storage System (BESS) and Pump Storage Projects (PSP) as per the guidelines for tariff based competitive bidding process notified by the Ministry of Power'.*
This is understandable since these are the only two scalable energy storage technologies at present. However, given the 10-year time scale of the regulations, it might be prudent to make this more general and re-draft it as,
'MPPMCL shall contract storage capacity corresponding to the results of LT- DRAP capacity addition requirement for future years from Battery Energy Storage System (BESS), Pump

Storage Projects (PSP) ***or any other cost-effective energy storage technology*** *as per the guidelines for tariff based competitive bidding process notified by the Ministry of Power'.*

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