Ref.no. PEG/2023/45

The Secretary
Maharashtra Electricity Regulatory Commission (MERC)
13th Floor, Centre No.1, World Trade Centre, Cuffe Parade
Mumbai- 400 005

Sub: Prayas (Energy Group) Comments and Suggestions on draft MERC (Renewable Purchase Obligation, its Compliance and Implementation of Renewable Energy Certificate Framework) (First Amendment) Regulations, 2023

Ref: Advt No. 27/2023-24

4th September, 2023

Maharashtra Electricity Regulatory Commission issued draft MERC (Renewable Purchase Obligation, its Compliance and Implementation of Renewable Energy Certificate Framework) (First Amendment) Regulations, 2023 on 5th August, 2023 and asked for public comments by 25th August, 2023, but later extended the last date to 4th September, 2023.

Considering the national target of 500 GW non-fossil fuel capacity by 2030 and that renewables (mainly wind and solar) will account for the bulk of that addition due to their low cost of generation, the proposed amendment to the MERC RPO regulations is very timely and welcome. The draft amendment proposes a RPO trajectory for 2024-30 in line with the MoP guideline in this regard. Maharashtra has and can continue to play a big role in contributing to this national goal through various initiatives, one of which is the regulation on RE purchase by the obligated entities in the state.

Our suggestions and comments on the proposed draft amendment are attached and we request you to take it on record and allow us to make any supplementary submissions if needed.

Kind Regards,

Ashwin Gambhir, Saumendra Aggarwal, Sneha Mannur

Prayas (Energy Group)

Comments and Suggestions on draft MERC (Renewable Purchase Obligation, its Compliance and Implementation of Renewable Energy Certificate Framework) (First Amendment) Regulations, 2023

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Our suggestions and comments on the proposed draft amendment are detailed below.

1. No need for introduction of new RPO categories

The amendment proposes new RPO categories which are HPO, Wind and Other RPO categories which are applicable from 2024-25 to 2029-30. In addition to this, energy storage obligation has been included. While we appreciate the long-term RPO trajectory target of 43.3% by 2030 and 4% ESO by 2030, the new RPO categories can create certain challenges and accounting complexity, some of which are highlighted below:

Wind RPO

The regulations define Wind RPO as follows:

> *"Wind RPO" means Renewable Purchase Obligation that shall be met by energy produced from Wind Power Projects (WPPs) commissioned after 31st March 2022 and the wind energy consumed over and above 7% from WPPs commissioned till 31 March 2022.*

This means some of wind generation (from projects commissioned till 31st March, 2022) might be considered under wind RPO for a year and might be considered under Other RPO in next year making accounting more complex. In any case, the data collated from RPO compliance orders indicate that this 7% provision might not be applicable for any DISCOM in the state and hence, can be removed from the regulation.

As per MERC Order dated 31st March, 2023 on Case No. 226 of 2022, the contracted capacity for wind source for MSEDCL is 3,546 MW as on 31st March, 2022. Considering 140 BUs as demand for MSEDCL and 21% CUF, the contracted capacity can only generate power enough to meet 4.6%. Similar trend was found for other 3 major DISCOMs of the state (refer the table given below).

	MSEDCL	BEST	AEML-D	TPL
Wind capacity contracted (MW) as on 31st March, 2022	3,546	*	*	*
CUF	21%			
Wind Procurement (MUs)	6,523		200	320

Total consumption (MUs)	1,40,000	4000	9000	5000
Share of Wind generation (% of total consumption)	4.6%		2.2%	6.4%

* No information is available from previous RPO compliance order for the respective DISCOMs. Hence, the power procurement from non-solar or explicit mention of wind purchase (in MUs) is considered for the above calculation.

HPO

The amendment proposes the introduction of HPO category and is defined as follows:

"4.3(a) HPO Target:
a.) HPO shall be met only by energy produced from all Hydro Projects (including Pumped Storage Projects (PSPs) and Small Hydro Projects (SHPs)) commissioned on and after 8 March 2019 to 31 March 2030;
b.) Energy from all other Hydro Power Projects (HPPs) including free power from HPPs commissioned before 8 March 2019 will be considered under category of 'Other RPO'
c.) HPO of the Distribution Licensee may be met out of the free power being provided to the State from Large Hydro Projects (including PSPs and Small Hydro Projects (SHPs)), commissioned after 8 March, 2019 as per agreement at that point of time excluding the contribution towards Local Area Development, if consumed within the Distribution Licensee area;
d.) In case, the free power mentioned above is insufficient to meet the HPO target, then the Distribution Licensee would have to buy the additional hydro power to meet its HPO target or may have to buy the corresponding amount of Renewable Energy Certificates corresponding to Hydro Power;
e.) Hydro Power imported from outside India shall not be considered for meeting HPO.;"

In this regard, we would like to draw Commission's attention to MSEDCL's list of contracted capacity under hydro source[1]. As on 31st March 2023, 600 MW future capacity has been contracted, the details of which are listed below:

Project name	Subansari	Pakaldul	Ratle	Kwar	Dugar	Total likely generation (MUs)
Expected commissioning (CEA)	Mar-24	Sep-26	Feb-26	Nov-26	Construction not yet started	
Capacity contracted (MW)	183	100	213	54	50	
Expected commissioning (MSEDCL)	2023-24	2025-26	2026-27	2026-27	2027-28	
Expected Generation in MU from these plants assuming 40% CUF (all India average for 2022-23)						
2024-25	641					**641**
2025-26	641		93			**735**
2026-27	641	175	746	63		**1626**
2027-28	641	350	746	189	175	**2102**
2028-29	641	350	746	189	175	**2102**
2029-30	641	350	746	189	175	**2102**

[1] https://www.mahadiscom.in/wp-content/uploads/2023/06/Final-PPA-List-for-31.03.2023-3.pdf

The table below shows that despite contracting 600 MW future capacity, the possibility of attaining HPO targets seems difficult for MSEDCL for all years even when considering that the plants will be commissioned as per CEA timelines (without any delay). Given the very long gestation period of new hydro power plants, it is unlikely that additional capacity would come online for MSEDCL in this time frame. However, this does not consider new PSP plants which are likely to come up in this time frame.

Year	New Hydro generation (MUs)	Likely Total consumption (MUs)	Likely HPO achievement (%)	HPO Targets (%)
2024-25	641	160000	0.40%	1.08%
2025-26	735	168000	0.44%	1.48%
2026-27	1626	176400	0.92%	1.80%
2027-28	2102	185220	1.14%	2.15%
2028-29	2102	194481	1.08%	2.51%
2029-30	2102	204205	1.03%	2.82%

While the social and environmental impacts of hydropower are already well known, it is increasingly not an economic resource as it is made out to be. In response to a Rajya Sabha question on stalled hydro projects, the Ministry of Power state that: 'As on 01.07.2017, there are 14 under construction Hydro Power Projects (above 25 MW), totalling 5,055 MW, which are stalled due to various reasons. The cost overrun calculated by CEA due to these stalled projects is Rs. 25,593.78 cr.'[2] Thus, there is on average a Rs 5 Crore/MW cost overrun for these projects, which is in stark comparison to the total cost of new solar and wind projects. Long gestation period further adds up uncertainty in terms of timely completion and increased cost overruns due to delay. Thus, the entire value proposition for large hydropower needs to be looked at afresh.

Considering all the aspects detailed above, **the proposed amendment should be redrafted so that there is no new separate wind, or hydro power obligations.**

Move towards a Composite RPO target

Considering the issues detailed above and the increase in compliance accounting complexity arising from various separate RPO obligations, it would be much more prudent and straight forward in stipulating one composite RPO for each year. In any case, the new Resource Adequacy guidelines and requirements would mean that each DISCOM will have to do an annual capacity expansion and production cost modelling exercise to determine what capacity mix would be most optimal in terms of investments but which would also be adequate for reliable 24X7 supply all year around. This will allow the obligated entities to plan the optimal power procurement strategy accordingly. This is important given that each state will have different

a. Load growth and load shapes
b. ToD frameworks
c. Sales migration patterns from CPP and OA.
d. Rooftop solar and EV penetration
e. RE generation profiles and CUFs.

[2] https://powermin.nic.in/sites/default/files/uploads/RS24072017_Eng.pdf

Therefore, having the same wind, hydro and other RPO targets for each state for each year from 2024-30 would not be practical. Thus, a composite RPO will be particularly beneficial and allow the states enough leeway in resource planning as the targets are now defined till 2029-30.

States like Karnataka and Andhra Pradesh have already adopted composite RPO targets for their obligated entities.

It should be noted that composite RPO targets are already proposed in the regulations for certain category of obligated entities, which is as follows (in 3rd proviso of 7.5(A)):

> *"Provided also that Distribution Licensee with peak demand less than 10 MW, a Captive User of a Captive Generating Plant with installed capacity of 1 MW and above, and Open Access Consumers with Contract Demand of 1 MW and above, shall be required to meet only their composite RPO target set out in column (d) of the Table above annually."*

Similar targets can be set for large distribution companies, which will promote optimal power procurement strategy by such distribution companies.

2. Energy Storage obligation (ESO) necessary and timely

The mandate for ESO is extremely necessary to enable reliable integration of higher shares of low-cost renewables in the grid. Considering an annual consumption of ~180 BU by 2024-25 in Maharashtra, a 1.5% ESO would translate to just over **7.4 GWh daily storage capacity**, most of which would have to be procured by MSEDCL. It would be prudent for obligated entities to quickly deploy pilot projects to better understand challenges or issues in deployment, business models and operation which could be communicated to the Commission so that relevant changes in Grid code, bidding documents or other regulations can be made in time.

Considering the round-trip efficiency of BESS at 85-90% and ~70-75% for PSP, it would be important for the Commission to clarify whether *'7.7 (b) The following percentage of total energy* ***consumed*** *shall be solar/wind energy along with/through storage'* refers to the **renewable energy input to the storage system or the output from the storage system.** We suggest that the 1.5% ESO in 2024-25 should be measured at the output from the storage system. Further, clear energy accounting rules for ESO should be developed so that Storage projects located outside Maharashtra have their output adjusted appropriately for ESO calculation at the state periphery. Similarly separate metering arrangements for clearly measuring the energy delivered from storage projects, esp. when co-located with solar or wind power should be put in place.

Considering peculiar position of Mumbai (Mumbai islanding scheme) and the significant need for augmenting transmission capacity for bringing power from outside the city, the Commission could consider additional ESO requirements. This will not only improve reliability for the area, but also reduce the need for urgent investments in transmission.

3. Carry forward provisions undermine effective compliance

The amendment has proposed to allow carry forward of shortfalls in future years (2023-24, 2025-26, 2026-27 and 2028-29), thereby undermining their own annual targets. The relevant provision is as follows:

> *"12.3 Any shortfall in meeting the minimum percentage of RE as specified in Regulation 7.1 or 7.5(A) may be carried forward from FY 2020-21 and FY 2021-22 to FY 2022-23, from FY 2023-24 to FY 2024-25,* ***from FY 2025-26 and FY 2026-27 to FY 2027-28 and from FY 2028-29 to FY***

2029-30 *and Obligated Entity shall meet such shortfall on cumulative basis by 31 March 2023, 31 March 2025,* ***31 March 2028 and 31 March 2030,*** *respectively*:"

This is particularly important as several shortfalls in past were allowed to be carried forward till date and no penalty was imposed by the Commission on any DISCOM for non-compliance. This has resulted in a cumulative shortfall of 25,569 MU across the 4 DISCOMs in Maharashtra as of March, 2022. This is 19% higher than the entire RE procurement in 21-22 at 21,569 MU.

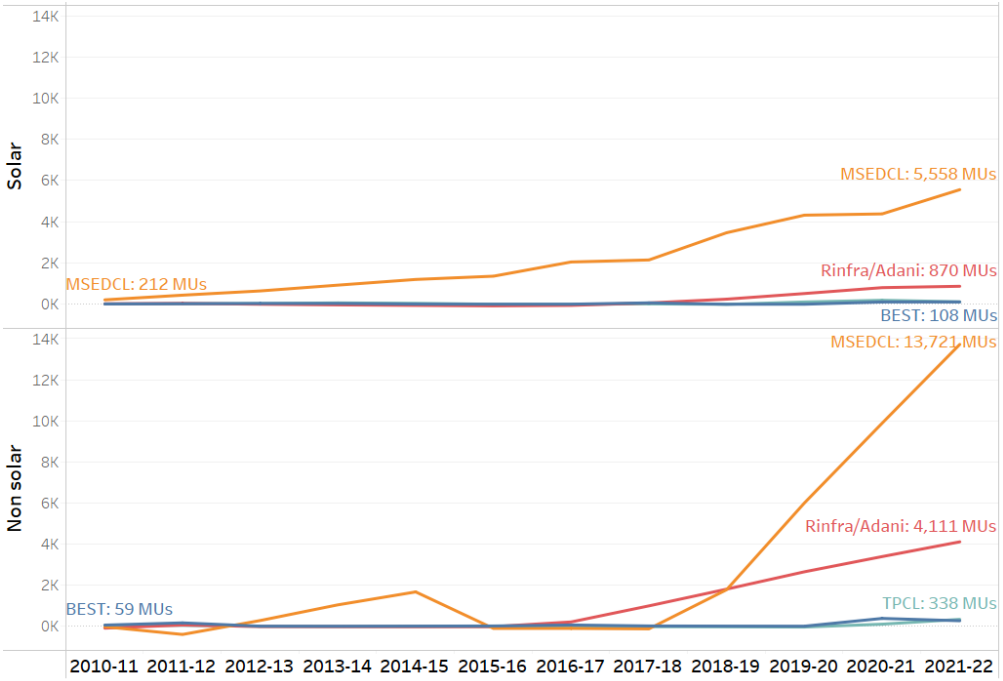
Thus, carry forward should not be allowed as a routine measure as has been the practice. The Commission should insist on annual compliance and question the reluctance to procure RECs, green power through market instruments (GTAM and GDAM) for short-term power procurement, instead of providing a perpetual escape route to obligated entities in form of carry forward. However, in case any carry forward is to be allowed for unforeseen circumstances, the same should be capped (up to 10% of total RPO targets, which should further reduce gradually).

Increasing quantum of shortfall for DISCOMs over the years

The RPO shortfall for DISCOMs is increasing over the years. The table below shows that the cumulative shortfall for 4 major DISCOMs is around 16% of annual gross energy consumption (excluding large hydro) and the quantum of cumulative shortfall is more than the quantum of RE procurement by the DISCOMs in the last year.

Particular	MSEDCL	BEST	TPC-D	AEML-D	Total
Gross Energy Consumption for FY 22 (MUs)	1,39,343	3,622	4,872	8,824	1,56,662
Total RPO Target for FY 22 (MUs) (@17.5%)	24,385	634	853	1,544	27,416
Total RPO Achieved for FY 22 (MUs)	19,370	747	691	760	21,569
Total RPO Shortfall /Surplus for FY 22 (MUs)	5,015	-113	162	784	5,847
Cumulative RPO Shortfall / Surplus till FY 22 (MUs)	**19,394**	**363**	**815**	**4,997**	**25,569**
Cumulative Shortfall as % of gross consumption	**13.9%**	**10.0%**	**16.7%**	**56.6%**	**16.3%**

The trend for cumulative shortfall for all the DISCOMs is shown in the graph below. This clearly shows that the quantum of shortfall has increased over the years.



Carry forward of RPO shortfall and no imposition of penalty in case of non-compliance

Every DISCOM has faced shortfall in either solar, non-solar RPO category or both on various instances. Despite this, the Commission has never imposed any penalty on DISCOMs. In place of this, the Commission has allowed carry forward of shortfall to following years on many instances.

Despite MSEDCL failing to comply with cumulative RPO targets till 2019-20, as per recent tariff order (226 of 2022), there is no proceeding on imposing or determining penalty on the DISCOM. Further the Commission has allowed a carry forward of the stand-alone shortfall for 2020-21 and 2021-22 along with earlier shortfall which was to be met by March 2023 (Order 49 of 2021) to be now met by March 2025. Such leniency in adhering to the spirit of the RPO regulations can be detrimental to whole RPO compliance process.

Analysis of past proceedings show that carry forward has been done on regular basis. Past year analysis for MSEDCL in this regard can be found below.

Table: Carry forward given to MSEDCL

<table>
<tr><th>Year</th><th>Solar</th><th>Non-solar</th><th>Mini-hydel</th></tr>
<tr><td>2010-11</td><td rowspan="4">Carry forward to 2015-16</td><td rowspan="3">Carry forward to 2013-14</td><td rowspan="5">Carry forward to 2015-16</td></tr>
<tr><td>2011-12</td></tr>
<tr><td>2012-13</td></tr>
<tr><td>2013-14</td><td>Carry forward to 2015-16</td></tr>
<tr><td>2014-15</td><td>Carry forward to 2016-17</td><td>Carry forward to 2016-17</td></tr>
<tr><td>2015-16</td><td rowspan="2">Carry forward to 2018-19</td><td rowspan="3">Target met</td><td>Carry forward to 2018-19</td></tr>
<tr><td>2016-17</td><td rowspan="2">Target met</td></tr>
<tr><td>2017-18</td><td>Carry forward to 2019-20</td></tr>
<tr><td>2018-19</td><td rowspan="2">Carry forward to 2022-23</td><td rowspan="2">Carry forward to 2022-23</td><td rowspan="2">Carry forward to 2022-23</td></tr>
<tr><td>2019-20</td></tr>
<tr><td>2020-21</td><td rowspan="2">Carry forward to 2024-25</td><td rowspan="2">Carry forward to 2024-25</td><td rowspan="2">No targets</td></tr>
<tr><td>2021-22</td></tr>
</table>

4. Effective Penalty Benchmarks and timely imposition

The relevant provision for penalty in this amendment is as follows (3rd proviso of Regulation 12.3):

> *"Provided also that any cumulative shortfall in RE procurement as on 31 March 2023 and/or 31 March 2025* ***and/or 31 March 2028 and/or 31 March 2030*** *shall not be carried forward for next year and be adjusted by imposing reduction in ARR for Distribution Licensees and imposing penalty for other Obligated Entities, at rate of floor price of respective REC as on that date:"*

CERC REC regulation 2022 has done away with floor price for RECs, hence, there is a need to amend the regulations by removing the reference to floor price. The penalty should be high enough and be effectively imposed to deter non-compliance. The penalty could be linked to the GDAM-GTAM price discovery or to the RE PPA rates for contracts concluded in the year for which compliance is being determined. It could be around 50% of these prices.

Also, there should be an additional graded penalty (like in the case of F&S DSM penalty for RE) in case shortfall of previous years is not met in the current financial year. This penalty can be graded (e.g., 0.1

Rs/kWh for remaining shortfall up to 5%, 0.25 Rs/kWh for 5-10% shortfall, 0.5 Rs/kWh for 10-20%, 1 Rs/kWh for >20% shortfall).

In addition to this, the commission should enhance transparency about the regulatory fund. The MERC should direct that information about the fund creation and amount / penalty collected in the fund and utilization of that amount should be published annually by MEDA or the State Govt. Further, the Commission should direct timely utilization of the fund and given the new ESO in place, these funds could be used towards supporting storage procurement and RE transmission deployment.

5. Incentive for over-achievement should be continued

The amendment has not included provision for incentive for over-achievement of RPO procurement beyond 2023-24. We suggest that the commission provide the incentive (say Rs 0.25/kWh of over-achievement) in case the obligated entity has no cumulative shortfall, achieves at least 110% of targets and the incentive can be limited to 150% of targets.

6. Making the compliance verification process timebound and adding forward looking aspects

The RPO regulation is incomplete without an adequate and effective process of RPO compliance verification. The analysis of past verification proceedings has clearly highlighted some of the issues with the present verification process. We have noted some of them in the following sections.

Verification process for all obligated entities

Firstly, while the commission has regularly verified RPO compliance for DISCOMs, the same is not true about other obligated entities (open access and captive consumers). MERC has only one verification proceedings for all the captive and open access consumers since 2010-11. No other proceeding is present in public domain and not even MEDA has reported any compliance proceedings for those consumers. With increasing OA and CPP consumption in the state, it is time to have an annual RPO compliance order for these obligated entities as well.

We suggest that the verification process for all obligated entities incl. CPP and OA is streamlined and a regular, annual reporting by SNA be made mandatory. The compliance status should be made publicly accessible.

Delay in verification process for DISCOMs

While we appreciate the regular verification for DISCOMs, there have been delays in verification proceedings over the years. The table below shows the time taken in RPO compliance verification for MSEDCL over the last 12 years.

Year	RPO Compliance Proceedings from end of FY (in days)
2010-11	634
2011-12	268
2012-13	346
2013-14	491
2014-15	533
2015-16	726
2016-17	487
2017-18	361
2018-19	891
2019-20	525
2020-21	730

2021-22	365

We suggest that the Commission incorporate clear and stricter timelines of verification of RPO compliance. Indicative timeline for such process is suggested below:

Process step	Timeline
Data submission by Obligated Entity to State nodal agency (SNA)	Within 45 days of end of financial year
Data submission by SNA to Commission	Within 30 days of data received by SNA
Public notice by Commission for inviting comments on verification process	Within 30 days of data received by commission from SNA
Finalisation of verification process	Within 75 days of issuing public notice to initiate public proceeding

In this way, the verification process can be completed within 180 days. In addition to this, the commission can ask for public reporting of RPO compliance status on quarterly basis within 15 days of end of each quarter by MEDA and by each Obligated Entity on their website.

Further, rather than making compliance verification purely an accounting exercise of the past, the MERC should direct all Obligated Entities to submit a quarterly or six monthly RE and storage procurement calendar for the next 2-3 years. This would enable the MERC to hold DISCOMs more accountable to their future RE and storage procurement planning.

7. Green hydrogen

The amendment additionally now allows for RPO fulfilment *by purchase of green hydrogen or green ammonia;*
The quantum of green hydrogen or green ammonia would be computed by considering the equivalence to the green hydrogen or green ammonia produced from one MWh of electricity from the renewable sources or its multiples and norms in this regard shall be notified by the Central Commission.

As far as we understand, CERC is yet to publish any norms in this regard. Thus, MERC should clarify the accounting framework in the absence of CERC norms. MERC should also clarify whether the renewable energy used for Green Ammonia/hydrogen production would be considered only in the RE procurement or also as part of the total gross consumption analysis. This will avoid future complexity around this issue.

Further the entire monitoring and verification mechanism for green hydrogen and ammonia procurement, its energy accounting needs to be developed and vetted, especially to avoid double counting of green credits. This is pertinent given the recent notification of the Rule for the Carbon Market Trading Framework by BEE/MoP.

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