Ref.no. PEG/2022/18

The Secretary
Karnataka Electricity Regulatory Commission
Tank Bed area, 16C-1, Millers Tank Bund Rd, Kaverappa Layout, Vasanth Nagar, Bengaluru, Karnataka 560052

Sub: Prayas (Energy Group) Comments and Suggestions on draft KERC (Promotion of Energy from Renewable Sources) (8th Amendment) Regulation, 2022

Ref: Public Notification (**No. Y/1/22/1648**)

12th May 2022

Dear Sir,

Karnataka Electricity Regulatory Commission issued draft KERC (Promotion of Energy from Renewable Sources) (8th Amendment) Regulation, 2022 on 20th April 2022 and asked for public comments by 12th May 2022.

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 KERC RPO regulations is very timely and welcome. The draft amendment proposes a RPO trajectory for 2022-30. Karnataka 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 submission in the matter is attached and we request you to take it on record.

Kind Regards,

Ashwin Gambhir, Saumendra Aggarwal, Ann Josey

Prayas (Energy Group)

Comments and Suggestions on draft KERC (Promotion of Energy from Renewable Sources) (8th Amendment) Regulation, 2022

Prayas (Energy Group), 12th May, 2022

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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 KERC RPO regulations is very timely and welcome. The draft amendment proposes a RPO trajectory for 2022-30. Karnataka 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 detailed below.

1. Reconsider the classification of solar and non-solar RPO targets

Separate solar RPO was mandated at a time when solar prices were so high (> Rs 10/kWh) that no entity would have purchased it without a mandatory separate obligation. Now the situation is quite the reverse with solar being the cheapest generation source. Ideally DISCOMs should have the full freedom to procure a mix of RE which is best suited for their load profile. This has also been reflected by the Forum of Regulators (FoR) during its 74th Meeting (held on 9th April, 2021) wherein it was agreed upon by FoR that "... a separate solar RPO is not relevant at present given the decline in the prices of solar power."[1]

In addition to this, in the recently approved regulations by CERC on the REC mechanism, there is no separate classification of "solar" and "non-solar" RECs. Hence, it is timely for the commission to come out with generic RPO targets instead of continuing with the solar/non-solar classification. Going forward, this will be beneficial for distribution companies in planning renewable power procurement.

2. Higher RPO trajectory possible by 2030

The proposed RPO trajectory is till 2030 and increases the total RPO from 22.50% (FY21-22 for BESCOM which has close to 50% of the total Karnataka load) to 45% (for BESCOM) by FY29-30 (see Table 1). **It is a welcome move to move away from setting short-medium term targets and give a decadal horizon and guidance to ESCOMs in this regard. KERC is leading the way among states in this regard.**

[1] Minutes of the Meeting for 74th Meeting posted on the FoR website can eb found here: http://www.forumofregulators.gov.in/Data/Meetings/Minutes/74.pdf

Table 1: RPO targets (existing and proposed)

ESCOMs	BESCOM	MESCOM	CESC	HESCOM	GESCOM	HRECS
2021-22	22.5% (10.5%)	23.5% (10.5%)	22.5% (10.5%)	21.5% (10.5%)	18.5% (10.5%)	21.5% (10.5%)
2022-23	25.5% (11.5%)	26.5% (11.5%)	23.5% (11.5%)	24.5% (11.5%)	22.5% (11.5%)	24.5% (11.5%)
2023-24	28.5% (12.5%)	29.5% (12.5%)	25% (12.5%)	26.5% (12.5%)	25.5% (12.5%)	26.5% (12.5%)
2024-25	30.5% (13.5%)	32.5% (13.5%)	26.5% (13.5%)	30% (13.5%)	28.5% (13.5%)	30% (13.5%)
2025-26	33.5% (14.5%)	35.5% (14.5%)	28% (14.5%)	32% (14.5%)	31.5% (14.5%)	32% (14.5%)
2026-27	36.5% (15.5%)	38.5% (15.5%)	29.5% (15.5%)	35% (15.5%)	34.5% (15.5%)	35% (15.5%)
2027-28	39.5% (16.5%)	41.5% (16.5%)	31.5% (16.5%)	38% (16.5%)	37.5% (16.5%)	38% (16.5%)
2028-29	41.5% (17.5%)	43.5% (17.5%)	33.5% (17.5%)	40% (17.5%)	40.5% (17.5%)	40% (17.5%)
2029-30	**45% (19%)**	**48% (19%)**	**36% (19%)**	**43.5% (19%)**	**43.5% (19%)**	**43.5% (19%)**

Note: First number in the table denotes total RPO targets for the ESCOM and the number in the bracket indicate solar-RPO targets for the ESCOM.

However, if one looks at tables 2 and 3 which detail the actual RPO compliance for FY 21, we see that all ESCOMs are over-complying by a far margin. At the state level, with a consumption of 52,820 MU (excl. hydro), the required RE purchase was 10,502 MU while in reality the compliance was nearly double at 20,160 MU. Thus the share of RE is already over 38% in Karnataka and it is the leading state in this regard.

Table 2: RPO Compliance status for FY21 In percentage terms

	Solar RPO		Non-solar RPO		Total RPO	
ESCOM	Target	Achieved	Target	Achieved	Target	Achieved
BESCOM	8.50%	20.14%	12.00%	15.09%	20.50%	**35.23%**
MESCOM	8.50%	16.74%	13.00%	17.14%	21.50%	**33.88%**
HESCOM	8.50%	16.56%	11.00%	28.40%	19.50%	**44.97%**
GESCOM	8.50%	18.03%	8.00%	29.04%	16.50%	**47.08%**
CESC	8.50%	20.91%	12.00%	10.68%	20.50%	**31.59%**

(Source: Tariff Order for various ESCOMs for FY2022-23)

Table 3: RPO Compliance status for FY21 in energy terms

	Consumption	Solar RPO		Non-solar RPO		Total RPO		
ESCOM	Net consumption (without large hydro)	Target	Achieved	Target	Achieved	Target	Achieved	Total RPO compliance
BESCOM	25,628	2,178	5,162	3,075	3,866	5,254	9,028	35.23%
MESCOM	4,690	399	785	610	804	1,008	1,589	33.88%
HESCOM	10,431	887	1,728	1,147	2,963	2,034	4,691	44.97%
GESCOM	6,715	571	1,211	537	1,950	1,108	3,161	47.08%
CESC	5,356	455	1,120	643	572	1,098	1,692	31.59%
Total	**52,820**	4,490	10,005	6,012	10,155	10,502	**20,160**	**38.17%**

(Source: Tariff Order for various ESCOMs for FY2022-23)

Further, the new RE policy of Karnataka, 2022 has set a target of additional 10 GW of RE capacity in the coming five years for the state. If one assumed a modest CUF of 25% and that 7.5 GW of the target would be procured by ESCOMs, this will result in an additional generation of 16,425 MU by 2027. If no other generation sources are added in this time frame, the total RPO compliance by FY 27 is likely to be 52.8% and total RE generation would be 36,585 MU as seen in table 4. This is an annual increase of 2.5%. If the same percentage rate of RE generation increase continues till FY 30, then the likely total RE share could be 60%.

Table 4: Likely RPO Compliance and targets by FY 27 and FY 30

	Consumption	Total RPO	
	Net consumption (without large hydro)	Actual RE generation	Total RPO compliance
Year	MU	MU	%
FY 2020-21	52,820	20,160	38.17%
FY 2026-27	69,245	36,585	52.83%
Annual increase from FY 21-27	2,738	2,738	2.44%
FY 2029-30			60%

Building on the existing RE procurement and considering the national target by 2030, the state target by 2027 and the continued low wind/solar prices, **we suggest the commission should reconsider the RPO trajectory proposed for 2030. We suggest that the KERC should only specify total RPO targets for all ESCOMs which could be**

a. **50-55% by FY 27**
b. **55-60% by FY 30**

Further, given compliance of 38% in FY 21 against a target of 18.5-23.5%, unless RPO targets are sharply increased in the coming 2-4 years, over-compliance would be inevitable and the RPO targets would not serve their purpose.

3. Need for detailed power sector dispatch modelling and associated Storage Purchase Obligation (SPO) Trajectory

While the above targets are certainly very high, they are not fully impractical given that 9 GW of RE projects are in the pipeline in Karnataka. However, to reliably integrate such high shares of RE, the KERC should direct ESCOMs to undertake detailed capacity expansion and production cost/dispatch simulations for Karnataka. Such studies can point out the value of various resources to maintain system reliability. While Karnataka enjoys a high share of hydro generation which helps in balancing demand and supply, it is very likely that some form of energy storage would be needed at scale since this will be critical to reliably integrating large share of renewables in the energy mix. The Karnataka RE policy of 2022 also talks about promoting energy storage. Thus it would also be important for KERC to consider energy storage targets. A storage purchase obligation (SPO) on the lines of the RPO framework would be a very positive development for the next phase of renewable energy growth. The exact SPO could be subject to detailed modelling studies and could be finalised in 6-12 months.

It is suggested that along with RPO targets, the final regulations specify that SPO targets will be detailed within one year from the date of notification of the regulations. These will be based on studies done by the ESCOMs.

4. RPO Compliance through GTAM and GDAM

The trading of RE power along with its green attribute has been allowed through introduction of Green Term Ahead market (GTAM) and Green Day Ahead markets (GDAM). Green power purchase through Power Exchanges is one route for RPO compliance. **We request the commission to include these options in the proposed regulations**, so as to formally acknowledge a new avenue for RPO compliance.

5. Consider proposing separate solar RPO targets to be fulfilled through KUSUM scheme projects in the state

Given the importance of solar power in powering agriculture in the day time and considering the slightly slower progress of KUSUM in the state, **we suggest that the KERC could consider a separate solar RPO targets for KUSUM scheme projects**. This is vital to kick start the decentralised MW scale solar program for agriculture in the state. This could be in place only until FY 26 or FY 27 and should certainly have a sun-set clause.

6. No need for Hydro Purchase Obligation

KERC has introduced a new HPO in line with the GoI guidelines in this regard. Large hydropower is a well-established conventional generation technology, being in existence for over a century. 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 stated 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

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

to the total cost of new solar projects (Rs. 3.5-4 Crore/MW) and new wind projects (Rs. 7 Crore/MW). Further, the gestation period for hydro projects is significantly long, coupled with uncertainty due to various factors. The CEA quarterly review dated December 2019[3] notes the time delay for on-going projects.

The average time overrun for the 35 listed projects is a staggering 7.7 years (Prayas analysis). Finally, a suite of emerging technologies can now provide a variety of the flexibility characteristics, which made hydropower a valuable resource for balancing in the past. Further, these are increasingly becoming available at much lower prices and with significantly lower gestation periods. Thus, the entire value proposition for hydropower needs to be looked at afresh.

To our knowledge, there is no under-construction hydro projects in the state and considering long gestation period, even new projects started in future might not be completed before FY 2029-30. Hence, the ESCOMs may face difficulty in purchasing the hydropower to comply with proposed HPO trajectory.

Considering all the aspects detailed above, the proposed amendment should be redrafted so that there is no new separate HPO or a separate hydro obligation as part of the existing non-solar RPO. In any case, all large hydropower generation is already subtracted from the total net consumption when calculating RPOs.

7. Provisions related to RPO compliance process

At present, the state commission assesses RPO compliance under true-up tariff petition hearing. However**, it might be better to have a provision within the regulations to conduct a separate public proceeding for RPO compliance process for obligated entities (separately for DISCOMs and other obligated entities).** This will increase the public participation in such an important process, while increasing public scrutiny on DISCOMs' power purchase strategy.

Along with this, the regulation has not put in a framework for providing timelines for data submission by obligated entities to state agency and by the state agency to the commission. Also, there is no mention of timeline for completion of RPO compliance proceedings by the commission itself. **We suggest incorporating the timelines for both data collection (30 days for monthly collection and 45 days for annual process) and annual compliance proceedings (60 days from the date of data submitted to the commission).**

8. Data reporting and monitoring

RPO targets are a very important part of promoting RE adoption in the state and its compliance process provides a platform to provide information about RE procurement by ESCOMs. It will be beneficial to include a provision for data reporting and RPO monitoring in these regulations, given the increase in RPO targets in the state. The data which should be reported by the ESCOMs on annual basis could be as follows:

1. Contracted, commissioned source-wise RE capacity by the ESCOM at the end of financial year
2. Source-wise RE capacity in the pipeline and expected date of commissioning
3. Year-wise source-wise breakup of capacity planned to be contracted in future
4. Expected RE power generation from this capacity and CUFs of contracted capacity

[3] http://www.cea.nic.in/reports/others/hydro/hpm/QUARTERLY%20REVIEW%20NO.%2099.pdf

5. Actual Month-wise RE power purchase and sale on Power exchanges under GTAM and Integrated-DAM (or Green DAM) contracts
6. Month-wise REC purchased and sold by the ESCOMs in last year
7. Capacity contracted and Power purchased from decentralised projects (Rooftop, KUSUM scheme or similar schemes in the state)

This data reporting should be done on annual basis within 45 days of completion of financial year and data should be submitted to the commission. The commission should place such data in the public domain for broader scrutiny.

9. Penalty provisions

With increasing RPO targets in the state, there is a possibility that some obligated entities fail to comply with the targets in the future, hence there is a need to incorporate sufficient penal provisions in the regulations to continue Karnataka's RE leadership status in the country. In this regard, the commission can adopt a similar approach adopted by the Maharashtra Electricity Regulatory Commission (MERC) in its RPO-REC regulations of 2019, which reads as follows:

> *"12.3 …*
> *Provided that Distribution Licensee shall be subjected to reduction in Annual Revenue Requirement at a rate of Rs 0.10 per kWh for cumulative shortfall in total RE procurement target for each year;*
> *…"*

10. Doing away with Pooled Cost of Power Purchase for REC projects.

With the tariff discovery for solar and wind projects being in range of Rs. 2.25-2.75 per unit in recent times and the pooled cost of power purchase (Rs 4.38/kWh for Karnataka in 2021-22 as per CERC[4]) being much higher than that, the DISCOMs should not be forced to buy power at pooled cost of power purchase under the REC mechanism. Also, introduction of GTAM and GDAM markets has opened new avenues for such projects to sell power in markets. Considering these sector realities, **we suggest the commission to do away with Pooled Cost of Power Purchase as a benchmark for REC projects.**

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[4] CERC order on calculating APPC rate at national level for FY 2021-22 can be accessed here: https://cercind.gov.in/2021/orders/01-SM-2021.pdf