KERALA STATE ELECTRICITY REGULATORY COMMISSION

THIRUVANANTHAPURAM

Present : Sri. T.K Jose, Chairman
Adv. A. J. Wilson, Member (Law)
Sri. B Pradeep, Member (Technical)

No. 230/Con.Engg/2023/KSERC Dated 7th August, 2024

STATEMENT OF REASONS

In the matter of: Kerala State Electricity Regulatory Commission (Renewable Energy and Net Metering) (Second Amendment) Regulations, 2024.

1. Section 86(1) (e) of the Electricity Act, 2003 authorizes the State Electricity Regulatory Commission to promote co-generation and generation of electricity from Renewable Source of Energy by providing suitable measures for connectivity with the grid and sale of electricity to any person and specify for the purchase of electricity from such sources, a percentage of the total consumption of electricity within the area of the distribution licensee. Accordingly, the Commission has notified the KSERC (Renewable Energy and Net Metering) Regulations, 2020 on 07th February, 2020. Further, it was amended on 15th July, 2022.

2. Ministry of New and Renewable Energy, Government of India, vide D.O letter N.o.238/6/2020 -EFM dated 15th December 2022 intimated that the country has set an ambitious target of 500GW of non-fossil fuel based capacity by 2030. For achieving the target laid down for Renewable Energy (RE) sector, obligated entities are required to comply with the Renewable Purchase Obligation (RPO) trajectory set by the Central Government. Ministry of Power (MoP) vide Order dated 22nd July, 2022 issued the RPO trajectory for the FY 2022-23 to FY 2029-30. In the said order, MoP introduced 'Wind RPO' for energy produced from Wind Power Projects commissioned after 31st March, 2022. Further, the 'Solar RPO' has been merged with 'Other RPO' in the aforesaid order of MoP.

3. Further, Energy Storage Obligation (ESO) has been specified by MoP in the Order dated 22nd July, 2022. It is mentioned that the Energy Storage Obligation shall be calculated in energy terms as a percentage of total consumption of electricity and shall be treated as fulfilled only when at least 85% of the total

energy stored in the Energy Storage System (ESS) on an annual basis, is procured from renewable energy sources. Currently, the implementation of Energy Storage Systems (ESS) in the country is in the pilot stage. But it is seen that Solar Energy Corporation of India Ltd. (SECI) has finalized tenders for RE hybrid projects with assured quantum for peak assistance through ESS at reasonable rates. More such tenders are in the pipeline. Hence the DISCOMs/Obligated entities can fulfil the ESS requirement through hybrid projects awarded through these tenders also. Also, cost of Battery Energy Storage Systems (BESS) is coming down significantly. Considering these, it was suggested to introduce ESO in the State from FY 2025-26.

4. The Commission has earlier directed KSEB Ltd to submit an action plan outlining the measures to achieve the RPO targets notified by MoP. In accordance with the guidelines set forth by MoP and taking into account the projected quantum of generation and/or purchase from RE Sources by the licensee, the Commission is required to specify the RPO trajectory for the period from FY 2024-25 to 2029-30. Considering the projections submitted by KSEB Ltd, it has been observed that the availability of wind energy within Kerala is lower in comparison with many windy states in India, making it challenging to establish specific trajectories for individual categories of renewable energy. But it is also noted that the WPO can be achieved by purchasing electricity from wind RE sources in other parts of the country at competitive rates. Accordingly, it was proposed that with the exception of hydroelectric power (HPO) and wind power (WPO), all other forms of renewable energy including solar may be categorized under 'other renewable energy' obligations.

5. Pursuant to the directive issued by the Ministry of Power (MoP) on 21st June, 2021, an extension has been granted for the waiver of Inter-State Transmission System (ISTS) charges applicable to the transmission of electricity generated from solar, wind and hybrid sources. This applies to projects that are scheduled to be commissioned on or before 30th June, 2025. Furthermore, the waiver of total ISTS charges was also extended to Hydro Pumped Storage Plant (PSP) and Battery Energy Storage System (BESS) projects that are planned for commissioning on or before 30th June, 2025. Subsequently, MoP through its order dated 23rd November, 2021, extended the waiver of ISTS charges for RE, Hybrid and Energy Storage projects which are commissioned beyond 30th June, 2025 but before 30th June 2028 in a graded manner (75%, 50% and 25%). However, the waiver for energy storage projects is subject to the condition that a minimum of 51% of the annual electricity requirement for pumping water in the Hydro PSP, or a minimum of 51% of the annual electricity requirement for charging the BESS, is sourced from electricity generated by solar and/or wind power plants. Central Electricity Regulatory Commission (CERC) through its

amendment of sharing regulations dated 7th February, 2023 has incorporated the waiver of ISTS charges in accordance with the order of MoP, in their Regulations. Apparently, the waiver provides an early bird incentive and the DISCOMs in Kerala may utilise the same by front loading its RPOs, in line with the policy objectives of the State.

6. Ministry of Power (MoP) vide notification dated 29th December, 2022 notified the procedure for implementation of uniform pooled renewable energy tariff. This is expected to boost renewable energy capacity addition as, a uniform pooled tariff will create a single rate for distribution companies (DISCOMs) for power contracted over a specified period, removing the barrier for delay in signing power purchase agreements having different rates discovered through different bids. MoP, through an Order dated 17th March, 2023, designated Grid-India as the Implementing Agency for the implementation of the uniform renewable energy tariff for central pool, as per the provisions of the Electricity (Amendment) Rules 2022. These rules establish a framework for different categories of central pools, each catering to specific renewable energy sources, including Solar Power, Wind Power, Hydro Power, Solar-Wind Hybrid, Round the Clock Power (Solar Wind Hybrid + Storage), Peaking Power (Solar Wind Hybrid + Storage), Firm and Dispatchable RE Power, and any other new pool specified by the Central Government. The duration of each central pool will be five years, and all capacity for which Power Supply Agreements (PSAs) are signed within this period will become part of the central pool. After the end of five years, no new capacity will be added in this pool, but the existing capacity will remain part of the pool until the expiration of their respective agreements. The Uniform Renewable Energy Tariff (URET) for central pools will apply only to end procurers for their contracted capacity, with no impact on the tariff discovered through competitive bidding and payable to renewable energy generators by the Intermediary Procurer. URET is expected to ease the procurement of RE. MoP vide Order dated 25th October, 2023 has notified the procedure for implementation of URET.

7. As per the State Climate Change Action Plan 2.0, the objective is to achieve 100% reliance on RE sources by the year 2040, and to attain net zero emissions by the year 2050. To achieve the target fixed by the Government of Kerala (GoK), a higher RPO trajectory than that specified by MoP is to be followed in the State. Further, the DISCOMs need to enter into RE purchase agreements without any delay, in order to reap the benefit of full waiver of ISTS charges for RE power in respect of projects commissioned before 30th June, 2025 and graded waiver of 75%, 50% and 25% of ISTS charges for projects to be commissioned between 1st July 2025 and 30th June 2028. In light of these considerations, it was suggested to implement an accelerated RPO trajectory for

the initial period spanning from 2024 to 2026, and the State shall aim to achieve 50% of the energy requirement from RE sources by 2030.

8. Government of India, Ministry of Power, has notified the Electricity (Rights of Consumers) Rules, 2020. The Rules seek to ensure that new electricity connections, refunds and other services are given in time-bound manner and that wilful disregard to consumer rights results in levying of penalties on service providers and payment of compensation to consumers. Further, the consumer rules were amended on 28th June, 2021, bringing in provisions for decentralised renewable energy generation and related matters. It is noted that definition of the terms 'net metering' and 'gross metering' in the rules are same as that provided in the regulations, while the definition of the term 'net billing or net feed-in' provided in the rules is not included in the regulations. In order to harmonise the rules and regulations, it was proposed to include the definition for 'net billing or net feed-in' as provided in the Rights of Consumers Rules, in the draft regulation.

9. Further, many stakeholders have raised the issue that the licensee is not considering diversity factor for the conversion of connected load to contract demand. Further, it is also seen that the licensee is taking sanctioned connected load or contract demand of the consumer along with aggregate solar panel capacity instead of considering the AC output of the solar inverter in kW, for the purpose of RE connectivity. Accordingly, an explanation note has been proposed in the draft specifying that the AC output of the solar inverter in kW shall be taken as 90% of the total kWp capacity of the solar panels.

10. A reference has been received from the Government of Kerala, based on a request raised by ANERT to revise the limitation set by the Commission for the loading of distribution transformer from 75% to 100%, for the purpose of RE connectivity. The Commission in the draft Kerala State Electricity Regulatory Commission (Renewable Energy & Net Metering) Regulations, 2020, had proposed that the cumulative capacity of distributed energy systems allowed to be interconnected with the distribution network shall not exceed 100% of the feeder and/or distribution transformer capacity. Further considering the submissions of the stakeholders during the hearing, the Commission has decided to limit the cumulative capacity of distributed energy systems that can be connected to the distribution feeder and/or transformer, as 75% of the feeder and/or distribution transformer capacity. It was also decided that the Commission may review this after completing two years from the date of notification of the KSERC (Renewable Energy and Net Metering) Regulations, 2020. Accordingly, Commission proposed to revise the limit set for the loading of

distribution transformer from 75% to 90%, for the purpose of RE connectivity, in the draft.

11. Further the Control Period or Review Period for determination of tariff for the electricity generated from Renewable Energy Sources under Chapter –IV of the KSERC (Renewable Energy and Net Metering) Regulations, 2020, was valid upto the financial year 2023-24 only. The amendment regulations proposed extension of the Control Period or Review Period by another year, i.e. upto the financial year 2024-25.

12. To address the matters indicated above, the Commission has published the Draft Kerala Electricity Regulatory Commission (Renewable Energy and Net Metering) (Second Amendment) Regulations, 2024 on 29th January, 2024, for inviting stakeholder comments and objections. To enhance transparency and improve informed stakeholder participation, the Commission has also published detailed explanatory memorandum along with the draft Renewable Energy and Net Metering (Second Amendment) Regulations, 2024, which details the facts and circumstances led to the publication of the draft amendment. Further, the Commission conducted first public hearing on the draft regulations on 20.03.2024, through hybrid mode and second public hearing was conducted on 15.05.2024, at the Institution of Engineers Hall, Vellayambalam. Several Stakeholders participated in the public hearings and many of them have presented their views/ suggestions on the draft Amendment Regulations. Further many stakeholders have submitted their written suggestions/ observations on the general aspects of prosumers with regard to billing system and banking of Renewable Energy. The Commission considered all the comments received from the stakeholders for finalizing the Amendment Regulations. The list of participants attended the hearing and those who submitted their written suggestion are attached as Annexure- 1 and Annexure -2 respectively.

13. The Commission, complying with the provisions of the Act and the Electricity (Procedure for Previous Publication) Rules, 2005 proceeded to finalize the Kerala Electricity Regulatory Commission (Renewable Energy and Net Metering) (Second Amendment) Regulations, 2024 (hereinafter referred as RE Amendment Regulations, 2024).

14. The Commission considered the comments/suggestions of the stakeholders on the draft RE Amendment Regulations, 2024. The Regulations have been finalized after due consideration of the various issues raised. It may be noted that all the suggestions given by the stakeholders have been considered, and

the Commission has attempted to elaborate all the suggestions as well as the Commission's decisions on each suggestion in the Statement of Reasons. However, in case any suggestion is not specifically elaborated, it does not mean that the same has not been considered. Wherever possible, the comments and suggestions have been summarised, along with the Commission's analysis and ruling on the same. The analysis of the issues and findings of the Commission thereon are discussed in subsequent paragraphs.

15. In sub regulation (1) of Regulation 2,–

(1) After clause (w), the following clauses shall be inserted, namely:-

2(1)(wa) 'Energy Storage Systems' or **'ESS'** means the technology that store energy generated from various sources and can be drawn upon at a later time to perform useful operation when needed, contributing to a more reliable and efficient power supply;

Comments from the stakeholders:-

Vimal Prakash Vamadevan

In the grid solar system (On grid) which is presently in use, the battery storage facility is avoided. As per the amendments cited above, storage facility recommended will result in huge expenses for ordinary roof top prosumers and hence this provision shall be avoided.

Analysis and Decision of Commission

Ministry of Power (MoP) vide Order dated 22nd July, 2022 has issued the RPO trajectory for the FY 2022-23 to FY 2029-30, wherein Energy Storage System (ESS) Obligation has been introduced. The objective of the ESS framework is to have Round the Clock (RTC) dispatchable RE power. MoP intends to reduce greenhouse gas emissions and reduce overall costs of energy by incentivizing the deployment of ESS and reducing the need for fossil fuel power plants.

The Commission has also noted that ESS is essential to ensure grid stability and reliability in the backdrop of increasing share of variable RE in power mix. The deployment of ESS will enhance grid services such as frequency regulation, voltage support, ramping, and other ancillary support services. Further, to maintain State grid having much higher proportion of RE, with excess generation during day time and considerable deficit during the evening peak, ESS such as Pumped Storage Plants (PSP), Battery Energy Storage Systems (BESS) etc. need to be developed and deployed in the system by the licensee and the prosumers. The Commission has noted that the cost of

BESS is coming down rapidly to reasonable levels. However, at present, the obligation to use ESS is put on the DISCOMs and other obligated entities only. In this view of the matter, the apprehension raised by the stakeholder is not correct. Hence, Commission has decided to retain the definition as proposed.

(2) After clause (w), the following clauses shall be inserted, namely:-

2(1)(wb) 'Energy Storage Obligation' or **'ESO'** means the obligation of the entity to store the energy from RE sources, which shall be calculated in terms as a percentage of total consumption of electricity and shall be treated as fulfilled only when at least 85% of the total energy stored in ESS is procured from renewable energy sources, on annual basis;

Comments from the stakeholders:-

(a) Vimal Prakash Vamadevan

As percentage of storage is not practical and non-viable for roof top prosumers, this provision shall be exempted.

(b) Madhulal J, InSDES Shoranur

The word procured shall be replaced with generated/procured in the best interest of Utility. The detailed methodology/ adjustment mechanism to account for the RE generated/ procured with Energy stored under ESO obligation may be specified. Considering high cost of storage, criterion of at least 85% may be relaxed to at least 50% during the initial years. Most of the domestic consumers are having battery as part of their inverters to meet the power outage conditions. As the number of consumers is huge, there is an untapped potential of making use of such batteries to share part of the peak demand period of the consumer from the battery itself. This requires a change in the control circuit of the inverter. If sufficient incentive is provided to the consumers, and utility is allowed to include this distributed storage in its ESO, such conversion can be carried out without expenditure to the exchequer, but with benefit to all including the willing prosumers. Such a regulatory intervention can aid further reducing the day time tariff, which could be made applicable to industrial consumers also, thereby increasing the possibility of industrial activity. They also mentioned that they can conduct a detailed study in liaison with the DISCOM with a time frame of 3-4 months.

(c) Boni Prasada Rao, Deputy Development Commissioner, CSEZA

CSEZA expressed concerns about the significant cost impact of these regulations on the distribution licensees like them, who purchase all their

power from the State Utility, KSEB Ltd. They suggest exempting small licensees who purchase power from KSEB Ltd, or if ESO is required, asking KSEB Ltd to cover it for small licensees.

Analysis and Decision of Commission

Ministry of Power (MoP) vide Order dated 22nd July, 2022 has issued the RPO trajectory for the FY 2022-23 to FY 2029-30, wherein Energy Storage System (ESS) Obligation has been introduced. The objective of the ESS framework is to have Round the Clock (RTC) dispatchable RE power. The order has put in the requirement of sourcing RE power for at least 85% of the power used for charging/pumping. This is in the interest of minimising carbon emissions. Also, the apprehension that fixing such high percentage will lead to higher cost is not valid in view of the lower tariffs discovered in bids for solar and wind energy procurement. Also, the RE power used as such for charging/pumping can be counted against their respective RPOs and thus will be beneficial to the DISCOMs and obligated entities. On the request of changing the wording 'procured' as 'procured/generated', it is clarified that entire RE energy, either procured or self-generated or generated by prosumers will be counted against RPO and ESO of DISCOMs.

On the concern regarding higher cost of Energy storage, it is noted that, MoP vide Order dated 15th March, 2024 has introduced a scheme for Viability Gap Funding for development of Battery Energy Storage Systems. As per the scheme, the Central Government has sanctioned the Central Sector Scheme: 'Viability Gap Funding (VGF) for Development of Battery Energy Storage Systems (BESS)', to develop 4,000 MWh of BESS capacities. The duration of the scheme shall be for a period of three years from 2023-24 to 2025-26. The projects under the scheme will be approved during this period and the funds will be disbursed up to 2030-31. It is to be noted that VGF of up to 40% of capital cost for BESS shall be provided by the Central Government in the first tranche. The operational guidelines of the scheme envisage bilateral agreement with BESS Implementation Agencies (BIA) for targeted energy support. The distribution licensees can make use of the scheme to meet ESO at affordable costs. Similarly, recent bids for dispatchable RE with storage and standalone solar or wind with storage etc has resulted in very competitive tariffs. Also, recent standalone BESS bids have discovered very reasonable tariffs indicating a sharp fall in battery costs. Hence, it appears that the apprehensions on possible huge burden on DISCOMs are without considering the latest developments in the sector.

Further, InSDES has mentioned that the number of consumers having inverter battery backup is huge and there is an untapped potential of making use of such batteries to share part of the peak demand period of the consumer from the battery itself. They have requested that if utility is allowed to include the distributed energy storage systems in its ESO, such conversion can be carried out without expenditure to the exchequer. The Commission notes the suggestion and propose to come out with suitable framework after consultations with stakeholders as part of framing draft RE Regulations for the control period commencing from 2025-26.

(3) After clause (am), the following clause shall be inserted, namely:-

2(1)(ama) "**Net-Billing or Net feed-in**" means a single bidirectional energy meter used for net-billing or net feed-in at the point of supply wherein the energy imported from the Grid and energy exported from Grid Interactive rooftop Solar photovoltaic system of a Prosumer are valued at two different tariffs, where-

(i) the monetary value of the imported energy is based on the applicable retail tariff;

(ii) the monetary value of the exported solar energy is based on feed-in tariff determined by the Commission;

(iii) the monetary value of the exported energy is deducted from the monetary value of the imported energy to arrive at the net amount to be billed (or credited / carried-over);

Comments from the stakeholders:-

(a) Mr. Sunukumar

KSEB Ltd is demanding the implementation of a gross meter reading system for consumers who have installed rooftop solar plants. Despite the government's encouragement of solar installation, this disloyal act by KSEB Ltd is discouraging consumers from investing in solar installations, as it appears to only serve the purpose of extracting money from ordinary consumers.

(b) T. P. Thadevus

The prosumers are being discouraged from joining the Solar India/Kerala mission due to various anti-prosumer acts by KSEB Ltd. Instead, KSEB Ltd should invest in electricity storage systems and promote incentives that will

undoubtedly improve their liabilities, promote electricity generation, facilitate sales to other states, and enhance financial gains.

(c) Madhulal J InSDES Shoranur

The term “deducted” in the clause (iii) shall have a prejudiced implication. Hence, the clause may be revised as "the difference between the monetary value of the exported energy and the monetary value of the imported energy shall be used to arrive at the net amount to be billed” (or credited / carried-over).

(d) Riju Muraleedharan and Shinod R

Despite Kerala sourcing over 80% of its electricity at higher costs from external sources, Rooftop Solar Power Project offers electricity to consumers at just Rs 2.69 per unit. However, those who have invested in these solar plants face financial burdens. Encouraging more households to adopt Rooftop Solar Installations, investing in electricity storage systems, and offering better compensation for solar-generated power could promote a wider shift to solar energy. Addressing silt accumulation in dams hosting Hydropower plants could boost hydropower generation, helping resolve KSEB's challenges. Introducing floating solar projects within these dams could further augment electricity generation. Additionally, Prosumers are discouraged by anti-prosumer initiatives by KSEB, hindering new Prosumers from joining the Solar India/Kerala mission. It is proposed that:

(i) Maintain the current billing system (net metering) and ensuring timely provision of net meters.

(ii) Withdraw fixed charges based on slabs for Prosumers.

(iii) To eliminate generation duty for prosumers.

(iv) To establish a framework for Prosumers to promptly receive payments owed under net metering.

(e) G Raj Kumar

It is strongly opposed that gross metering shall not be introduced. He stated that Proposed shift from net metering to gross billing under the Central Government's Rooftop Solar Scheme undermines its objectives.

(i) Violate scheme spirit and contractual terms, risking investment recovery.

(ii) Convert consumers into producers without consent, leading to potential legal disputes.

(iii) Imposes peak prices bi-monthly but delays export payments, causing financial strain.

(iv) Charges producers Rs 8.7/unit for usage but pays only Rs 3.5/unit for exports, unjustly.

(v) Bi-monthly billing favors KSEB Ltd unfairly, delaying export payments for 18 months.

(vi) Maintain original payment cycle to prevent peak rate charges. Alternatively, pay exporters at peak KSEB Ltd rates to offset peak price burden.

(f) Mr. Abhilash M and Mohanan

Commission may review its decision to switch billing system from net metering to net billing & instead incentivize solar panel installation for consumers investing in RE sources for electricity generation.

(g) Vimal Prakash Vamadevan

This provision shall be deleted. The existing billing system should be continued.

(1) Presently there are more than 3 lakhs roof top solar prosumers in the state with more than 900MW of energy production and the number is increasing day by day. The payback period is currently 4-5 years. If the new clauses are to be introduced, the payback period will go up to 25 years and hence it is impractical.

(2) It is not advisable to equate Pumped Storage Power Plant, Wind Power Plant and Solar Power Plant on an equal basis. Solar Plants are smaller in size in domestic installations and each small installation counts. The obligation of Solar Power shall be viewed separately.

(3) Domestic Solar Plants are installed mostly by the middle class due to the subsidy available. When net billing on basis of Tariff is done, the attraction of subsidy vanishes, and the number of Solar installations will come down.

(4) In existing conditions, domestic Solar Plants people who are elderly and who have settled down after their financial obligations are carried out. Long Payback periods will not be attractive to the aging population, especially in Kerala, when the benefits of return cannot be enjoyed by such prosumers.

(5) The majority of solar installation in the rural area are installed on loans taken from financial Institutions, proposed amendments will add hardship to their repayment

(6) The price escalation of the solar plant has doubled for the past couple of years. Even though the subsidy has enhanced, installation cost of the roof top solar plant is not financially viable and practical.

(7) The solar prosumers shall be advised to use the energy in the day time to overcome the peak load crisis.

In this context the proposed amendments shall be withdrawn forthwith in the interest of the public and the state. If we go with this amendment, the solar project in the state will be nipped in the bud itself

(h) George Prothasis

Requested before the Commission and KSEB Ltd to take appropriate steps to remove incentives that are unfairly given to companies like CIAL and relieve the burden on regular consumers.

(i) Confederation of Renewable Energy Entrepreneurs (CORE)

They strongly opposed implementation of gross metering/net billing for solar energy in Kerala as it involves metering all solar generated electricity and crediting it at a fixed rate irrespective of whether the energy is consumed onsite or fed back into the grid. This would be detrimental to the progress of solar energy adoption (lack of incentives) and could hinder State's transition towards a cleaner and more suitable future.

(j) Neenu Skaria, Electricity Convener, KSSIA

The suggestions made would not promote RE generation.

Analysis and Decision of Commission

Ministry of Power, Government of India has notified the Electricity (Rights of Consumers) Amendment Rules, 2021 on 28th June, 2021, wherein the Ministry has proposed 3 types of billing mechanism, namely:- Net Metering, Net Billing and Gross Metering. The Central Government Rules and State Regulations needs to be harmonised, also taking into account the peculiarities of each state. The definitions of net metering and gross metering as available in central government rules are already provided in the KSERC (Renewable Energy and Net Metering) Regulations, 2020; but definition for net billing was not provided for. Hence, Commission has proposed to include the definition for Net Billing as available in the rules, in the draft for amending the RE Regulations, 2020. Most of the comments furnished by the stakeholders were based on the mistaken notion that the Commission is introducing gross metering to all consumers in the state. The Commission, during the public consultation process itself has clarified that no such proposal is presently

under the consideration of the Commission. To consider the matter in the correct perspective, the definition of the term 'Gross metering' as provided in the RE Regulations, 2020 as amended in 2022 is reproduced below:

"2(1) (aca) "Gross-Metering" means a mechanism whereby the total renewable energy generated from Grid Interactive Renewable Energy Systems and fed into the grid by a consumer/ prosumer vis-à-vis the total energy consumed by such consumer/ prosumer is separately accounted for at their applicable tariff as determined by the Commission."

As can be seen, Gross metering is a system which considers the total renewable energy generated and total energy consumption of the prosumer separately and billing these two energy values at their respective tariffs. However, under Net billing system the renewable energy generated in excess of the requirement of the prosumer and thus exported after internal use and the energy imported by the consumer in excess of his generation are billed at respective tariffs. Obviously, these are two different ways of accounting and billing for prosumers as introduced by the rules notified by the Central government, in addition to the prevailing system of net metering. However, the Commission is yet to decide on which class or category of consumers each of these three billing/accounting systems will be applicable. As of now, and after these amendments become/remain effective, energy accounting and billing of consumers will continue as per Regulations 20, 21, 26, 27, and 29 (which are not amended through this notification) for each respective class of consumers/prosumers as specified therein. Thus, most of the comments of the stakeholders are not relevant for the present amendment and the Commission does not find it necessary to delve separately into each of such remarks.

Further, Sri. Riju Muraleedharan, Shinod R and other stakeholders have mentioned that the rate for the net surplus energy banked by the prosumers is settled at a reduced rate (APPC) of Rs 2.69 / unit, for the FY 2022-23. It may be seen that APPC is determined as per the methodology stipulated in the Regulations notified by the Commission in line with the Regulations of CERC. APPC is the weighted average pooled price at which distribution licensee has purchased electricity including cost of self-generation, if any, in the previous year from all energy suppliers, long-term and short-term, but excluding those based on renewable energy. The APPC for the respective financial year is derived based on the source wise details of generation and power purchases for the preceding financial year. Accordingly, the APPC for the settlement of excess energy for 2023-24 was determined by the Commission as Rs 3.15

per unit. Further, stakeholders may also take note that the rate of energy exported to the grid under net billing and gross metering need not necessarily be the APPC rates determined annually. The feed-in tariff for settlement of exported energy under such arrangements generally would take into account the prudent cost of investment, O&M expenses and a reasonable rate of return for the prosumer, to protect the interest of prosumers. Since the Commission is yet to determine the class or category of consumers for whom the new energy accounting/billing is to be made applicable, the feed-in tariff is not being determined as of now.

Commission takes note of the suggestion of InSDES and is of the view that the term "deducted" in clause (iii) could be interpreted in a skewed manner also. Hence clause (iii) is revised as below:

2(1)(ama) "**Net-Billing or Net feed-in**" means a single bidirectional energy meter used for net-billing or net feed-in at the point of supply wherein the energy imported from the Grid and energy exported from Grid Interactive rooftop Solar photovoltaic system of a Prosumer are valued at two different tariffs, where-

(i) the monetary value of the imported energy is based on the applicable retail tariff;

(ii) the monetary value of the exported solar energy is based on feed-in tariff determined by the Commission;

(iii) the difference between monetary value of the exported energy and the monetary value of the imported energy shall be used to arrive at the net amount to be billed (or credited / carried-over).

(4) After clause (aw), the following clause shall be inserted, namely:-

2(1)(awa) '**Other RPO'** means the obligation of the entity to purchase electricity generated from RE power projects other than Wind Power Projects accounted for WPO and Large Hydro Power Projects (including PSPs) accounted for HPO;

Comments from the stakeholders:-

(a) Madhulal J InSDES Shoranur

In HPO definition PSP is included, which is also included under the broader Scope of ESS. Hence, there is anomaly in the definition proposed.

Analysis and Decision of Commission

Ministry of Power (MoP) vide Order dated 22nd July, 2022 has issued the RPO trajectory for the FY 2022-23 to FY 2029-30, wherein MoP mentioned that Other RPO may be met by energy produced from any RE power project other than 'WPO' and 'HPO'. As per the MoP order, energy from PSP can be accounted as part of HPO. Thus, the proposed definition is in order. At the same time, it is true that the energy from PSP can be accounted to meet ESO also. It appears to the Commission that MoP consciously has provided the above additional incentive to obligated entities in view of the necessity to promote accelerated development of PSPs. Meanwhile, the Commission has noted that Ministry of Power vide Corrigendum issued on 19th September, 2022 has substituted the words **"LHPs (including PSPs)"** in Para 5(b), 8, 9 and 14 and the word **"LHPs)** with the words **"Hydro Power Projects (including PSPs and Small Hydro Projects (SHPs))"**. The Commission carefully considered the impact of the changes in the RPO framework consequent to the corrigendum issued as above by MoP. Essentially, energy from all Hydro projects viz Large Hydro Projects (LHPs), Small Hydro Projects (SHPs) and Pumped hydro Storage Projects (PSPs) commissioned after 8th March 2019 is to be counted against Hydro Power Obligation (HPO). Similarly, energy from all these forms of hydro projects but commissioned till 8th March 2019 is to be counted against 'Other RPO'. To give effect to these changes the proposed clause 2(awa) is finalised as under:

2(1)(awa) '**Other RPO'** means the obligation of the entity to purchase electricity generated from RE power projects other than Wind Power Projects accounted for WPO and **Hydro Power Projects (including PSPs and Small Hydro Projects (SHPs))** accounted for HPO;

Further, it is noted that the clause (aea) under sub regulation 1 of regulation 2, defining the term "Hydro Power Obligation" also needs amendment to bring effect to the notification of MoP dated 19th September, 2022. Accordingly, the clause is amended as under:

2(1) (aea) "Hydro Power Obligation" or **"HPO"** means the obligation of an entity to purchase electricity **generated** from **Hydro Power Projects (HPPs)** including Pumped Storage Projects **and Small Hydro Projects** which has come into commercial operation after 08.03.2019;

(5) After clause (bc), the following clause shall be inserted, namely:-

2(1)(bca) 'Pumped Storage Projects' or 'PSP' means a hydro power project which generates **power** through water stored as potential energy, pumped from a lower elevation reservoir to a higher elevation reservoir, either during lean seasons when storage/ inflow into the upstream reservoir is inadequate or on a round the year basis in cases where catchment area is small, by having a reservoir at the downstream with adequate capacity to store water for pumping;

Analysis and Decision of Commission

No comments were received. Meanwhile, the Commission has noted that the definition does not capture closed loop PSPs and accordingly the definition is slightly modified as under:

2(1)(bca) 'Pumped Storage Projects' or 'PSP' means a hydro power project which generates power through water stored as potential energy, pumped from a lower elevation reservoir to a higher elevation reservoir, either during lean seasons when storage/ inflow **into** the upstream reservoir is inadequate or on a round the year basis in cases where catchment area is small **or nil**, by having a reservoir at the downstream with adequate capacity to store water for pumping;

(6) In clause (bg), the words "other than the conventional power plant" shall be omitted.

2(1)(bg) 'Renewable Energy System' means the power plant and connected systems, generating grid quality electricity from renewable energy sources;

Analysis and Decision of Commission

The Commission has proposed the modifications to align the definition in line with the MoP Order dated 22nd July, 2022, wherein the RPO target has been proposed for the period from FY 2023-24 to 2029-30. Since, no comments were received on the draft proposed, Commission has decided to finalize the same as such.

(7) In clause (bi), the words "commissioned after 08.03.2019" shall be omitted.

2(1)(bi) 'Renewable Source of Energy' means the source for the generation of electricity from renewable sources such as small hydro, large hydro with capacity above 25 MW, wind, solar including its integration with combined cycle, biomass, bio fuel cogeneration, urban or municipal solid

waste and such other sources approved by the MNRE as renewable source;

Analysis and Decision of Commission

Ministry of Power (MoP) vide Order dated 22nd July, 2022 has issued the RPO trajectory for the FY 2022-23 to FY 2029-30. In the said Order, MoP has specified that from F.Y. 2022-23 onwards, the energy from all Hydro Power Projects (HPPs) including free power from HPPs commissioned before 8th March 2019, will be considered as part of RPO. The HPO trajectory, as has been notified earlier will continue to prevail for Hydro Power Plants (HPPs) commissioned after 8th March 2019. All other HPPs will be considered as part of `RPO' under category of 'other RPO'. In view of the above, the modification has been proposed. Further to provide clarity to the definition Commission has decided to replace the word ‘source’ with ‘energy source’. The Regulation is modified as below:

2(1)(bi) ‘Renewable Source of Energy’ means the **energy** source for the generation of electricity from renewable **energy** sources such as small hydro, large hydro with capacity above 25 MW, wind, solar including its integration with combined cycle, biomass, bio fuel cogeneration, urban or municipal solid waste and such other **energy** sources approved by the MNRE as renewable **energy** source;

(8) After clause (bu), the following clause shall be inserted, namely:-

2(1)(bv) ‘Wind Power Obligations’ or **‘WPO’** means the obligation of the entity to purchase electricity generated from Wind Power Projects (WPPs) commissioned after 31st March, 2022;

Analysis and Decision of Commission

The definition is based on the MoP Order dated 22nd July, 2022, wherein it is specified that Wind RPO shall be met only by energy produced from Wind Power Projects (WPPs), commissioned after 31st March 2022. Commission has decided to finalize the definition as proposed.

16. In Regulation 3, Table 1(a) shall be inserted after Table 1, as follows;

Table 1(a)

Financial Year	Quantum of generation and/or purchase from Renewable Energy Sources and the quantum of energy to be stored in ESS, as a (%) of the total consumption (in terms of energy in kWh)				
	HPO	WPO	Other RPO	**Total RPO**	**ESO**
2024-25	2.2	1.7	36.1	**40**	**0**
2025-26	2.4	1.75	38.85	**43**	**0.25**
2026-27	2.8	1.8	41.4	**46**	**0.50**
2027-28	3.5	1.9	42.6	**48**	**0.75**
2028-29	3.9	2	43.1	**49**	**1.00**
2029-30	4.2	2.2	43.6	**50**	**2.00**

Comments from the stakeholders:-

(a) KSEB Ltd

KSEB Ltd has concerns regarding two provisions in the draft regulation, which are favourable to consumers. The Commission has set Renewable Purchase Obligation (RPO) targets for the years 2024 to 2030. This category encompasses hydropower obligation, wind power obligation, other RPOs, and total RPOs, including energy storage obligation. It mandates that by 2024-2025, 40% of total power consumption, and by 2029-2030, 50% of total consumption, must be sourced from renewable energy (RE). According to the provisions of the Electricity Act, the Commission has the authority to determine the percentage of renewable energy (RE) power to be procured, as outlined in the tariff policy. This determination should consider the availability of RE power in our state, its impact on consumer electricity tariffs, and should be comparable with tariffs in other states. However, the current RPO targets set by the Commission do not align with these provisions of the tariff policy and the Ministry of Power (MOP) notification regarding RPO targets.

Currently, in the fiscal year 2023-2024, the Renewable Purchase Obligation (RPO) target stands at 21.84%. If hydroelectric power is included, it amounts to only 30%. However, in the draft proposed the Commission has raised the RPO target to 40% by the fiscal year 2024-2025. Such a sudden increase of 10% will require the addition of an additional power capacity of 787 MW to the system. As per the Tariff Policy of 2016, it is recommended to align the Renewable Purchase Obligation (RPO) targets with those of other states when the commission sets the RPO targets for our state. However, most states have set RPO targets lower than those suggested by the Ministry of Power (MOP) regulations, while some have aligned with them. Remarkably, our state has decided to set targets 10% higher than the MOP's recommendations. This proactive approach aims to meet the Government of Kerala's action plan targets by 2030, which can be facilitated by higher RPO targets. To incentivize the achievement of these targets, renewable energy projects, including wind and solar, commissioned before June 30, 2025, will be granted a waiver on Inter State transmission charges. To avail of this benefit and further increase the renewable energy quantum, collaboration and tie-ups with various stakeholders will be essential.

According to the explanatory memorandum to the draft, State Climate Change Action Plans must strive for a higher Renewable Purchase Obligation (RPO) target by 2030. However, upon reviewing the State Climate Change Action Plan, KSEB noted that the RE target stands at 3.46 GW, whereas the Hon'ble Commission proposed an addition of 6.4 GW as per the draft RPO target. There are doubts about the grid's capacity to absorb such a significantly higher RE capacity. In the multiyear tariff order, the commission approved energy sources corresponding to the demand for the upcoming three years (2024-2025). Consequently, KSEB Ltd has already committed 75% of the thermal Real-Time Contract (RTC) capacity in line with our demand, leaving only 24.81% of available space to absorb RE based on current demand. Since the market opportunities for selling RTC power fluctuate, KSEB will not be able to absorb more RE power into the grid without selling additional power after its utilization.

(b) Shibu Kurian, Asst. General Manager (Electrical), TCCL

TCCL requested before the Commission to refix RPO figures for open access consumers for years 2024-25 to 2029-30, at a reasonable level in line with Central Government trajectory and which shall be below RPO figures specified by central government to promote industrial electricity consumption in state. The sharp rise in Renewable Purchase Obligation (RPO) from 21.84% to 40% between 2023-24 and 2024-25, marking an

83% increase, is unjustifiable. This substantial increase will significantly raise Open Access costs, negatively impacting industries in the state that rely on Open Access power to reduce their electricity bills. While the purpose of RPO is to encourage renewable energy adoption, such a sudden and steep increase will harm industrial electricity consumers in the state.

(c) Boni Prasada Rao, Deputy Development Commissioner, CSEZA

Requested that RPO obligations may be reviewed and reduced suitably.

(d) Madhulal. J InSDES, Shoranur

The ESO (Storage obligation) for 2025-26 is shown as 0.25% of the total consumption for the year 2025-26. Total Annual Consumption (FY 2022-23)- Internal Generation+ External Purchase- was 27,741.54 m.u**.** Considering this 0.25% ESO would imply- approximately 200 MWh storage capacity. This is highly optimistic and may not be feasible at competitive rate. At national level also, the implementation of storage schemes may commence by this period only and hence the benefit of economy of sizes may not be available in this time frame.

(e) KSEB Engineers Association:

As per National framework for promoting energy storage systems, the renewable energy power purchased from an ESS shall also qualify for Renewable Purchase Obligation (RPO) compliance. So, in Regulation 3 of this amendment, Table 1(a) - ESO shall be inclusive of RPO.

The Electricity (Rights of Consumers) Rules, 2020 amendment dated 28th June 2021, it is mentioned that in case of net-metering or net-billing or net feed-in, the distribution licensee may install a solar energy meter to measure the gross solar energy generated from the Grid Interactive rooftop Solar Photovoltaic system for the purpose of renewable energy purchase obligation credit.

Renewable Energy System integration needs real time data. So, they suggested installing Smart meters in all these Renewable Energy Sources (Prosumer premises) in a phased manner. There should be a provision to gather the data to SLDC for energy forecasting. Hence the generation meters also be a smart meter.

Further the Rules provides that in the case of Prosumers availing net-billing or net feed-in**,** the Commissions may introduce time-of-the-day tariffs whereby Prosumers are incentivized to install energy storage for utilization of stored solar energy by them or feeding into the grid during peak hours. This may help the grid by participating in demand response of the DISCOMS.

Electricity (Rights of Consumers) Amendment, Rules 2023, mentions that the Time-of-Day tariff for Commercial and Industrial consumers having maximum demand more than ten Kilowatt shall be made effective from a date not later than 1st April, 2024 and for other consumers except agricultural consumers. MoP have requested to implement the above regulation at the earliest in Kerala. As of now only industrial consumers above 10kW and domestic consumers having consumption more than 500 units is in TOD. Also suggest including agricultural consumers above 50kW in TOD, so that they will be encouraged to use pumping during solar hours.

Tata Power has joined hands with BMC for a unique demand flexibility program powered by solar energy. The initiative aims to incentivize the shifting of water pump demand from 'non-solar' and 'peak demand' hours to 'solar' and 'off-peak' hours resulting in Time of Day (ToD) tariff benefit. This will not only allow BMC to access clean renewable power to deliver water to Mumbai Kars, but also help the corporation to save on its power consumption bills.

KSEBEA has requested to put forth proposal for flattening the Load Curve by shifting peak load to off peak hours. They suggested to change the peak ToD time zone from (18.00 hrs - 22.00 hrs) to (17.00 hrs - 23.00 hrs) to encourage people to use more power during solar hours. Due to Power Quality issues due to Solar Generators, Power Quality penalties shall be imposed for Harmonic Dumping. Reactive power drawal from the grid shall be charged at appropriate rate for all consumers.

Further mentioned that Electric Vehicles can be used for Renewable Energy storage. So, they can be used to reduce the price of EV charging by 50 percentage during solar hours. Increase the EV charging tariff during peak hours so that EV charging providers will be forced to increase the EV charging tariff during peak hours. EVs with Vehicle to Grid charging shall be considered as Energy Storage system, hence V2G shall be promoted, and regulation shall be formed.

Analysis and Decision of Commission

The Commission has noted the suggestions of the stakeholders in this regard. Government of India has set an ambitious target of 500GW of non- fossil fuel-based energy capacity by 2030. For achieving the target laid down for Renewable Energy (RE) sector, it is necessary for the obligated entities to comply with the RPO trajectory set by the Central Government. Further, as per

the State Climate Change Action Plan 2.0, the objective is to achieve 100% reliance on RE sources by the year 2040, and to attain net zero emissions by the year 2050, much ahead of the National target of 2070. To achieve the target fixed by the Government of Kerala (GoK), a higher RPO trajectory than that notified by MoP is to be followed in the State. The MoP order provided for specifying a higher target by the State Commissions. In order to accomplish these goals, the total RPO proposed in the draft is higher than that provided by MoP. But necessary changes have been made in WPO and HPO trajectory considering the situation prevailing in the State. The proposed RPO (%) trajectory for the period from FY 2024-25 to 2029-30 was indicated in the draft regulations.

In the Order of MoP dated 22nd July, 2022, read along with the Corrigendum dated 19th September, 2022 it is mentioned that any shortfall remaining in achievement of 'Other RPO' category in a particular year can be met with either the excess energy consumed from WPPs, commissioned after 31st March, 2022, beyond 'Wind RPO' for that year or with excess energy consumed from eligible Hydro Power Projects (including PSPs and SHPs), commissioned after 8th March, 2019, beyond 'HPO' for that year or partly from both. Further, any shortfall in achievement of 'Wind RPO' in a particular year can be met with excess energy consumed from Hydro Power Plants, which is in excess of `HPO' for that year and vice versa. Also, all Hydro projects commissioned till 8th March 2019 can be considered as part of 'other RPO'. This, along with the accelerated adoption of rooftop solar plants in the state make the targets under 'other RPO' achievable. The Commission has also proposed that excess energy beyond target set for 'other RPO' can be accounted for meeting any deficit under WPO. With these proposed changes in the framework for RPO, KSEB Ltd can fully account the entire hydro generation in the state as part of their RPO, unlike in the earlier framework. Taking into consideration the generation of 7379.75 MU from large hydro projects as approved for 2024-25 in the MYT order dated 25-06-2022 along with the RPO target set as a percentage of energy consumption of KSEB Ltd in the RE Regulations at 21.84% (4747.63 MU) to be achieved in 2023-24 itself, the RE energy to be available with KSEB Ltd to meet the RPO as per the new framework aggregates to 12127.37 MU, which is about 40.39% of the approved energy consumption of the state for 2024-25. In light of these considerations, Commission has suggested to implement an accelerated RPO trajectory for the initial period spanning from 2024 to 2026, and the State shall aim to achieve 50% of the energy from RE sources by 2030.

Commission has also seen that Ministry of Power vide Order dated 09.06.2023 has waived of ISTS charges (Inter-State Transmission Charges) for off-shore wind power projects commissioned on or before 31st December, 2032 for a period of 25 years from the date of commissioning of the Project.

The off-shore projects commissioned from 1st January, 2033 would be given graded ISTS charges. Earlier, all wind energy projects commissioned till 30.06.2025 were provided full waiver and graded waiver for projects commissioned within a further period of 3 years. Now, offshore wind would be treated separately, and waiver to these would be granted up to 31st Dec, 2032 with graded transmission charges thereafter. The Central Government has also granted complete waiver of ISTS charges for a period of 25 years from the date of commissioning of the project, for Green Hydrogen/Green Ammonia production units, using Renewable Energy (commissioned after 8th March 2019), Pumped Storage System or Battery Storage Systems or any hybrid combination of these technologies. The projects commissioned on or before 31st December, 2030 shall be eligible for this waiver. The projects after 31st December, 2030 will attract graded transmission charges thereafter. The decision effectively extends the applicability of waiver date from 30 June 2025 to 31 Dec 2030. Further to promote development of Pump Storage Plants (PSP), the criteria for availing the complete waiver of ISTS charges for PSP projects has now been linked to the date of award of the project rather than commissioning of the project. This shall be applicable in cases where construction work is awarded on or before 30th June, 2025.

The ISTS charges on drawl of energy from energy storage projects, which was earlier granted to the project, will henceforth be available for each individual user of such project. The individual user will get this benefit, if at least 51% of the energy utilized by the user for charging the storage system is renewable energy. Earlier the limit of 51% was at project level. This change has been proposed in view of the fact that in future the capacity of such storage projects will be shared by many discoms / other users and only some of them may meet these criteria of 51% individually while the same may not be met in an aggregate manner at storage project level. Moreover, in case a project is eligible for waiver of transmission charges based on its original COD (Date of Commissioning), the same benefit will continue to be made available if COD is extended by competent authority. This is considered necessary to give confidence to the investors who are taking investment decisions based on the present circumstances but their COD may extend beyond the relevant applicable date for transmission charge waiver for reasons beyond their control.

Further, The Central Government in June, 2024 has launched the Viability Gap Funding (VGF) scheme for offshore wind energy projects which includes an outlay of Rs.6853 crore for installation and commissioning of 1 GW of offshore wind energy projects, and grant of Rs.600 crore for upgradation of two ports to meet logistics requirements for offshore wind energy projects. The VGF support from the Government will reduce the cost of power from offshore wind projects and expected to make them viable for purchase by DISCOMs.

The Commission has also noted that intermediary procurers as authorised by the Central Government invites bids and awards RE projects at frequent intervals for large capacities on behalf of DISCOMs in the country and the rates discovered therein are very attractive. The gestation period for such awarded projects are much lower than the time taken for completing RE projects in the state.

KSEB Ltd may explore measures to comply with the RPO targets, by sourcing electricity from RE sources in other parts of the country also, in an economical manner, in case any difficulty is felt in meeting the entire RPO from projects within the state alone.

The Total RPO requirement for KSEB Ltd as per the proposed draft based on the Energy Consumption at Kerala Periphery (to arrive at the energy consumption of SBU-D of KSEB Ltd, the intrastate transmissions losses can also be excluded additionally) and the additional RE procurement required over and above that specified in the existing regulations is shown in table 1 below:

Table 1 : RPO Requirement

FY	Energy Consumption at Kerala Periphery as per ARR* (in MU)	Total RPO proposed in the Draft (in %)	**Total RPO proposed in the Draft (in MU)** **(1)**	Large Hydro Generation as per ARR* (2)	**Solar and Non-Solar RE procurement as per existing regulation (in MU)** **(3)**	**Additional RE to be procured (in MU)** **(4) = (1)-(2)-(3)**
2023-24	28815.42			7077.22	**4747.63**	
2024-25	30025.21	40.00	**12010.08**	7379.75		**(-) 117.30**
2025-26	31318.32	43.00	**13466.88**	7272.29		**1446.96**
2026-27	32737.44	46.00	**15059.22**	7314.72		**2996.87**

*Figures from ARR Order dated 25th June 2022 for MYT period up to FY 2026-27

The figures are self-speaking and it can be seen that the accelerated RPO proposed in the draft is achievable especially in view of the recognition of Large Hydro Projects also as RE sources of energy. However, the Commission has noted that KSEB Ltd has not been taking earnest efforts to

fulfil even the existing RPO and that may create bottlenecks in achieving the revised RPO in the initial years. While, this state of affairs cannot be allowed to continue, it is also important that the new targets shall be achievable through earnest efforts. Keeping this in mind, the Commission has decided to lower the RPO for initial years and to make up that in the targets for the subsequent years. The obligated entities including KSEB Ltd shall take earnest efforts to meet the targets so revised and any failure in this regard will be dealt with in accordance with the law.

InSDES mentioned that the ESO (Storage Obligation) for 2025-26 of 0.25% of the total consumption may not be achievable at competitive rates. However, it is noted that recent bids for BESS has discovered very attractive tariffs. Moreover, recent bids for RE plus storage and dispatchable Hybrid RE with storage has resulted in tariffs comparable or lower than that of thermal power tariff. Further, as already noted in preceding paragraphs, MoP vide Order dated 15th March, 2024 has introduced a scheme for Viability Gap Funding for development of Battery Energy Storage Systems. At the same time, in view of gestation periods for new projects the Commission has decided to revise ESO for 2025-26 to 0.15%.

The Commission has examined the comments of M/s TCCL and noted that the open access quantum actually availed by the embedded open access consumers in the state is only a small fraction of their total electricity consumption. Also, the RPO of open access consumers is linked to the quantum of open access energy and not their entire electricity consumption. It is also noted that the open access consumers has avenues like GDAM and GTAM for sourcing renewable energy to meet their RPO. Further, the Central Government and CERC has put in place effective mechanisms for green energy open access to enable consumers to source RE from any part of the country. The Commission has also introduced green tariff to facilitate the consumers to meet their intended quantum of green energy from the DISCOMs itself. Thus, it is clear that the open access consumers has sufficient avenues to meet the proposed RPO trajectory.

The comments of KSEB Engineers Association are related to operational matters and the Commission can take a view on these matters based on proposals of KSEB Ltd., and subsequent public consultation process.

Considering the above, Commission has decided to revise and finalise the RPO and ESO trajectory as provided in the Table 1(a) below:

Table 1(a)

Financial Year	Quantum of generation and/or purchase from Renewable Energy Sources and the quantum of energy to be stored in ESS, as a (%) of the total consumption (in terms of energy in kWh)				
	HPO	WPO	Other RPO	**Total RPO**	**ESO**
2024-25	2.2	1.20	33.60	**37**	**0**
2025-26	2.4	1.75	37.85	**42**	**0.15**
2026-27	2.8	1.8	41.4	**46**	**0.50**
2027-28	3.5	1.9	42.6	**48**	**0.75**
2028-29	3.9	2	43.1	**49**	**1.00**
2029-30	4.2	2.2	43.6	**50**	**2.00**

17. Sub regulation (i) of Regulation (4) shall be replaced with the following sub regulation, namely: -

(i) Every distribution licensee shall meet the renewable energy obligation at the percentage specified in Table 1 and Table 1(a) above:

Provided that the energy, if any, generated by the distribution licensee from the renewable sources of energy and supplied to its consumers shall be accounted towards its renewable purchase obligation:

Provided further that the hydro power generated or purchased in excess of the Hydro Power purchase obligation may be accounted towards meeting any deficit in achieving the WPO or Other RPO for that year:

Provided also that Hydro Power Projects other than those commissioned after 8th March, 2019 will be considered as part of RPO under the category of 'Other RPO':

Provided also that any shortfall in the achievement of Wind RPO in a particular year can be met with, either from the excess energy consumed beyond the HPO or from the Other RPO or partly from both;

Analysis and Decision of Commission

The Change is proposed by the Commission, in view of the revised RPO targets proposed by the Commission for the FY 2024-25 to 2029-30, to have

more flexibility for the obligated entities to achieve the target through different available RE sources. No comments were received. Commission has decided to finalise the same as proposed.

18. In Regulation 5, -

1) The words “Table 1 above” shall be replaced with the words “*Table 1 and Table 1(a) above”.*

2) The second proviso shall be replaced with the following proviso, namely:-

> Provided further that the solar energy, if any, generated and consumed by the captive consumer in excess of their ‘Other RPO’ may be accounted towards its HPO or WPO:

Analysis and Decision of Commission

The Change proposed by the Commission in view of the revised RPO targets proposed by the Commission for the FY 2024-25 to 2029-30 and the definition for HPO and WPO proposed. No comments were received. Commission has decided to finalise the same as proposed.

19. In Regulation 6, the amendment proposed is same as that proposed in Regulation 5 as above. Commission has decided to finalise the same as proposed.

20. In Regulation 8, the sub regulations (2) and (3) shall be omitted and the sub regulations (4) and (5) shall be renumbered as sub regulations (2) and (3).

8. Purchase of Renewable Energy Certificates under the REC Regulations,-

(1) If any obligated entity fails to satisfy its renewable purchase obligation during any financial year, it shall purchase Certificates to make good such short fall. Subject to the terms and conditions in these Regulations, the certificates shall be the valid instruments for the discharge of the mandatory renewable purchase obligation of an obligated entity.

(2) Subject to such direction as the Commission may issue from time to time, the obligated entity shall be bound to act consistent with the provisions of the REC Regulations, for the procurement of the certificates for fulfilment of the renewable purchase obligation under these Regulations.

(3) The obligated entity, shall within two months after the end of every financial year, report the compliance of its Renewable Purchase Obligation of the respective year, including the details of the renewable energy certificates, if any, purchased for meeting the RPO and if directed by the Commission produce the same for verification and ascertaining the compliance.

Analysis and Decision of Commission

The Change proposed by the Commission in view of the revised RPO targets notified by the Commission for the FY 2024-25 to 2029-30. No comments were received. Commission has decided to finalise the same as proposed.

21. In sub regulation (1) of Regulation 10, the following proviso shall be inserted as second proviso, namely: -

Provided further that;

(i) the Renewable Purchase Obligation specified in Table-1, upto the financial year 2021-22 will be governed by the Kerala State Electricity Regulatory Commission (Renewable Energy and Net Metering) Regulations, 2020, as it stood prior to these amendments;

(ii) for the financial years 2022-23 and 2023-24, Renewable Purchase Obligation will be governed by the Kerala State Electricity Regulatory Commission (Renewable Energy and Net Metering) (First Amendment) Regulations, 2022, as it stood prior to these amendments; and

(iii) the Renewable Purchase Obligations for the financial years from 2024-25 to 2029-30 will be governed by these Regulations, as amended under Kerala State Electricity Regulatory Commission (Renewable Energy and Net Metering) (Second Amendment) Regulations, 2024.

Analysis and Decision of Commission

The Change proposed by the Commission in view of the revised RPO targets notified by the Commission for the FY 2024-25 to 2029-30. No comments were received. Commission has decided to finalise the same as proposed.

22. In clause (a) of sub regulation (2) of Regulation 13, the following explanation shall be inserted, namely: -

Explanation:

The AC output of the solar inverter in kW shall be taken as 90% of the total kWp capacity of the solar panels.

i.e., for a consumer with 100 kVA contract demand, the kWp capacity of the solar panels permissible is: 100 (kVA) x 0.9 (pf) / 0.90 = 100 kWp.

Comments from the stakeholders:-

(a) Confederation of Renewable Energy Entrepreneurs (CORE)

They strongly opposed proposal in draft amendment to limit solar capacity as percentage of Solar Inverter Capacity. The commission's limitation of solar inverter capacity to 90% of the solar panel capacity lacks justification.

Efficient solar power plant design typically includes 20% to 35% DC overloading, as outlined in MNRE Advisory/Clarification letter dated 5th November 2019. Higher DC ratings are essential to compensate for factors such as panel degradation, imperfect orientation, and shading, ensuring sufficient AC output in the future. That is why solar/renewable capacity must be defined in terms of AC side capacity only. Moreover, the latest Grid inverters as per the manufacturers datasheet itself are capable of handling DC capacity of 150% of the AC capacity. For these inverters to work efficiently the inverters must run at maximum DC capacity. Hence, the present regulation which defines capacity as per the AC side rating of the inverter should be continued.

(b) Neenu Skaria, Electricity Convener, KSSIA

They suggested to avoid Reg 13[2](a) modification mentioned in above mentioned explanation.

They suggested that direction may be given to the licensee not to multiply the kW of inverter capacity with 0.9 to arrive kVA capacity, because all inverters work at unity power factor. The efficiency of the inverter will be very high if 20% over injection of DC capacity is there.

Hence suggested to include the following sentence to Regulation 13 (2) (a), "the capacity of the inverter in kW may be taken as contract demand capacity in kVA". Installed capacity of the inverter is consider as the capacity of the solar installation."

(c) G Sivaramakrishnan, President, Kerala Renewable Energy Entrepreneurs & Promoters Association (KREEPA)

They suggested to take ac output of solar inverter as 80% of total capacity of solar panels. Since under typical conditions, solar power systems experience losses in DC energy output before reaching the inverter due to environmental factors and sub-section losses. These losses, including those from temperature coefficients, soiling, voltage drops, and mismatch, amount to approximately 75-80%.

(d) Sri. Suhail, Managing Director, Green Roof Solar Private Limited

He suggested continuing the practice of allowing flexibility in the ratio, as many OEMs and inverter manufacturers recommend oversizing the DC capacity based on their specifications and varying site conditions. He noted that the ratio can vary according to component laws and pointed out that all solar inverters certified under IEC 62109 Part 2 ensure safety. Different companies may oversize the DC capacity by varying percentages, such as 50%, 25%, or even 100%, depending on the quality of components.

Therefore, he argued against declaring a specific AC:DC ratio. European countries have a council, such as the Clean Energy Council, that allows oversizing limits to be determined at the discretion of the installer or developer, demonstrating a more structured approach. Sri. Suhail Jaleel proposed that the AC:DC ratio should be limited to 90% based on the transformer's capacity.

(e) George Thomas

KSEB Ltd should consider implementing distribution transformer rewards to meet the increased demand during the renewable energy transition. Power plants with an AC to DC ratio of 1:1.5, resulting in 50% excess at the DC side and 27% at the AC side, highlight the need for efficient energy management strategies. Mandating south-facing solar plants for non-south-facing rooftops can optimize energy generation. Technical feasibility waivers for up to 5 kW installations can expedite solar adoption. Encouraging solar energy-based charging stations along highways and installing common solar plants in residential areas instead of individual rooftops can further promote renewable energy usage. Mitigating concerns related to the transition from net metering to gross metering through clear responses from the commission is essential to prevent discouragement from solar installation. These initiatives collectively contribute to a smoother transition towards renewable energy and grid modernization.

Analysis and Decision of Commission

Commission has noted the suggestions of stakeholders in this regard. Commission has seen that generally, solar power plant produces 80-85% of power output from SPV power Plant (kWp). Solar Modules on DC side does not deliver 100% power at Nominal Operating Cell Temperature condition. DC side overloading is a good option to improve AC power output of SPV Plant. It allows solar plant to increase generation and optimize overall performance.

Further, The Ministry of New and Renewable Energy (MNRE) has issued an advisory/clarification dated 05-11-2019 stating that as long as the solar PV power plant is in accordance with the contracted AC capacity and meets the range of energy supply based on Capacity Utilisation Factor (CUF) requirements, the design and installation of solar capacity on the DC side should be left to the generator / developer. The Ministry further clarified stating that any person is entitled to set up any capacity which he desires to set up, and sell power to any entity which may want to buy it. Commission has also seen that IEC 62109-2:2011 covers the particular safety requirements relevant DC to AC inverter products as well as products that have to perform inverter functions in addition to other functions, where the inverter is intended for use in photovoltaic

power systems. Inverters covered by this standard may be grid-interactive, stand-alone, or multiple mode, may be supplied by single or multiple photovoltaic modules grouped in various array configurations, and may be intended for use in conjunction with batteries or other forms of energy storage. In view of the above, Commission has decided to allow DC overloading in solar inverters and to revise the explanation as below:

Explanation:
The AC output capacity rating of the solar inverter or 85% of the total Solar PV panel capacity, whichever is high, shall be taken as the capacity of solar plant for the purpose of connectivity. The Solar inverters installed by the prosumers shall comply with IEC 62109-2:2011 or BIS-certified solar inverters complying with the relevant safety standards.

23. In sub regulation (2) of Regulation 14, the words “shall not exceed 75%” shall be replaced with the words “shall not exceed 90%”.

14(2) The cumulative capacity of distributed energy systems allowed to be interconnected with the distribution network shall not exceed 90 % of the distribution transformer capacity as the case be.

Comments from the stakeholders:-

(a) KSEB Ltd

The penetration of solar in the Kerala Power System is increasing at a rapid rate. This causes numerous issues both technical and commercial for distribution utility. They mentioned that with the present limit of 75% loading limit, high voltage is observed on the LT side of the transformers at various locations, which even results in disconnection of solar inverters. Considering the necessity to study the impact of solar penetration, to identify various issues in the distribution sector and for finding the solutions, its financial impact and technical issues on account of the increasing solar penetration, KSEB Ltd has constituted a committee. The committee conducts a detailed study on the following aspects:

(i) Impact of RE generation in power quality in LT system due to the installation of solar;

(ii) Neutral shifting phenomenon in distribution transformer due to the installation of solar;

(iii) Impact of increasing the cumulative capacity of distributed energy systems from 75% to 90%;

(iv) Commercial impact due to banking;

(v) Proposals for mitigating the technical and commercial issues;

(vi) Capacity of solar plants connected to each phase of transformer.

Hence, KSEB Ltd requested before the Commission not to revise capacity of distributed energy systems allowed to be interconnected with the distribution network for the purpose of RE connectivity.

(b) Madhulal J InSDES, Shoranur

Load on Distribution Transformer (DTR) needs to be a considered. In lightly loaded DTRs, prosumers may face Overvoltage cutoff. Regarding the permissible limit of solar that can be provided based on feeder capacity and transformer capacity, it is suggested that a detailed study is required on the technical issues involved. Even with the 75% loading limit, high voltage is observed on the LT side of the transformers, causing disconnection of solar inverters of some of the prosumers. High voltage of 264V (higher voltage cut-off setting 240V+10%=264V and lower cut-off 240V-20%=192V) is reported to have occurred on some prosumer premises. Increasing this limit to 90% though welcomed as a step to promote more RE integration, this step should be supplemented with a detailed study within a time frame, of say 3 months, allowing the DISCOM to furnish the study results.

To increase the solar penetration level, the active contribution of the inverters to absorb reactive power at high voltages is to be made mandatory. It is observed in general that several models of the solar inverters which have the facility to choose constant voltage operation. But the solar suppliers tend to keep the setting on maximizing the power output irrespective of the voltage. A change in the inverters capable to control the voltage is necessary. InSDES requested before the Commission to revise the State Grid Code in view of the Central Electricity Regulatory Commission (Indian Electricity Grid Code) Regulations, 2023. InSDES further mentioned that they can contribute regarding the same by collecting the data and study the matter as an independent third-party consultant, if required.

(c) Neenu Skaria, Electricity Convener, KSSIA

Requested before the commission to maintain this modification as proposed. The non-standard neutral earthing of KSEB Ltd poses risks, potentially leading to inverter tripping due to developed voltages on the neutral from return neutral currents. It is imperative for KSEB Ltd to be directed to implement plate or rod earthing to achieve an earth resistance of 1 ohm or less. Therefore, a clause should be included in the Regulation

stating that “all distribution transformers must be properly earthed to achieve an earth resistance of less than one ohm.” Additionally, KSEB Ltd lacks awareness of the necessity of shield winding in transformers for the injection of solar power. Thus, another sentence should be added to the regulations, mandating KSEB Ltd to purchase only distribution transformers with shield winding in the future.

(d) G Sivaramakrishnan, President, Kerala Renewable Energy Entrepreneurs & Promoters Association (KREEPA)

KREEPA welcomes the current modification in the cumulative capacity of distributed energy systems allowed to be interconnected with distribution network. Due to the significant injection of solar power, many Distribution Transformers have reached capacity limits. To meet growth targets, enhancing DT capacity and repowering are necessary. Also requested the Commission to instruct M/s KSEBL to review the Capital Investment Plan to allocate resources for state's renewable energy growth.

(e) KSEB Engineers Association:

Since in Distribution transformer, 11 kV is in Delta connection and LT in Star Connection, the excess solar generation and low load will have following problems:

(i) Over voltage

(ii) Synchronization issues (Distributed Energy Resources)

(iii) Single phase inverters will make the system highly unbalance.

In sub regulation (2) of Regulation 14, the words “shall not exceed 75%” shall be replaced with the words “shall not exceed 90%” as proposed.

As the distribution transformers are not generator transformers, we request honorable commission to not alter this. The cumulative capacity of distributed energy systems allowed to be interconnected with the distribution network shall not exceed 75 % of the distribution transformer capacity as the case be.

(f) Sri. Suhail, Managing Director, Green Roof Solar Private Limited

The revision for limitation specified for the loading of distribution transformer from 75% to 90%, for the purpose of RE connectivity may be finalized.

(g) Suraj (Wahni from GREEN Technologies)

The loading of distribution transformer may be changed to 100%.

(h) James Kutty Thomas

As per Regulation (13) 2 (a), the AC output of the solar inverter, limited to 90% of the total kWp capacity of the solar panels (up to 20 kWp), be considered. Commission may clarify whether this is mandatory for domestic solar prosumers.

(i) Muhammed Rafeeq

As an electrical contractor, supervisor licensee, and solar vendor, concerned about the impact of changing the connected load proportion from 75% to 90%. This adjustment will strain transformer load capacity, as only 80% of the transformer's capacity should be loaded. Consequently, new transformer installations may be necessary, even if existing transformers can handle a 200kW connected load, still they are not permitted to integrate 100 kVA of solar power under same transformer. This limitation discourages solar installation in certain regions and needs to be addressed to promote renewable energy adoption. Furthermore, additional charges levied on prosumers for the electricity they generate should be separated from the fixed charges on their electricity bills. This would encourage more prosumers to invest in solar energy systems.

(j) Saji Mathew, MRF, HT and EHT Association

Increasing transformer capacity from 75% to 90% is a practical decision to meet rising electricity demands and accommodate renewable energy sources like solar power. Implementing bimonthly meter reading until net metering is fully practiced ensures accurate billing without overburdening consumers. Distributing meter reading duties among more officials can ease the workload of sub-engineers and improve efficiency. Billing systems for solar prosumers should be fair and reasonable to encourage renewable energy adoption without imposing excessive charges.

Analysis and Decision of Commission

ANERT has requested to the Commission through Government of Kerala, to revise the limitation set by the Commission for the loading of distribution transformer from 75% to 100%, for the purpose of RE connectivity. They have also mentioned that they have launched ambitious projects to make Kerala capital as the largest solar city in India. ANERT mentioned that the limit set for the loading of distribution transformer for RE connectivity need to be revised for achieving such projects.

The Central Government is also envisaging schemes that aims to decrease dependency on traditional energy sources by installing rooftop solar panels in

houses and moving towards sustainable energy practices. It pushes for clean and sustainable energy.

KSEB Ltd has mentioned that the capacity may not be revised. Due to excessive RE penetration over voltage issues has been noticed in some of the areas. KSEB Ltd has mentioned that they have entrusted a committee to study on the implications of large scale integration of RE systems in the distribution network. Even though the Committee was directed to submit the report by 10th June, 2024, no report was received so far. KSEB Ltd shall propose, based on detailed study, measures required for ensuring power quality in the LT network even while more and more RTS systems are integrated to the network. Already, technical reports are available suggesting solutions to address the concerns raised. Commission has considered all these factors and decided to finalize the revision of cumulative capacity of RTS plants as 90% of the distribution transformer capacity for RE connectivity. At the same time, KSEB Ltd can propose various safeguard measures and solutions to be incorporated by different stakeholders to address anticipated issues due to RE penetration, after conducting necessary evaluation and studies. The Commission can introduce such measures appropriately after due consultation with the stakeholders. In view of the above, the amendment is finalized as proposed.

24. In sub regulation (1) of Regulation 33, the words “for five (5) years” shall be replaced with the words “up to the financial year 2024-25”.

33. Control Period or Review Period. -

(1) The Control Period or Review Period under these Regulations shall be up to the financial year 2024-25, starting from the financial year 2019-20.

Analysis and Decision of Commission

The Control Period or Review Period specified in KSERC (Renewable Energy and Net Metering) Regulations, 2020 was upto the financial year 2023-24. Commission has decided to extend the control period upto the financial year 2024-25. Hence, this amendment was proposed and decides to finalize the amendment as proposed.

25. Meanwhile, false news has been spread out by the social media platforms and leading newspapers that the Commission is going to change the Net Metering system to implement Gross Metering/ Net Billing in the State and the draft Amendment Regulation is regarding the same. Based on the above news many prosumers have attended the public hearings with the apprehension that gross metering is going to be implemented in the State. The Commission during the public hearings elaborated on the necessity of the new draft regulation and has also clarified that, the provisions for the implementation of Gross Metering/ Net

Billing for any class or category of consumers in the State has not been included in the proposed draft. Further informed that such proposal, if any in future will be introduced only after prior consultation with the stakeholders.

26. Further, the following suggestions related to prosumers, but not specifically related to the draft amendment regulations published have been received during the public hearing:

(1) Biju K John

i. Bills provided by KSEBL may be simplified for the easy understanding of the common consumers of Kerala. The following details may be clearly specified in the bill:

(a) Monthly generation details;

(b) Energy consumed from solar generation;

(c) Energy consumed from KSEBL;

(d) Banked energy

ii. Bills may be provided in regional language Malayalam.

iii. At present energy reading from the net meter of the prosumers are not taking in a proper way. Officers usually taking the energy reading on 5^{th} or 10^{th} in a month and recording the same energy reading as the reading on 1^{st} in a month in the electricity bill issued. This results in increase in fixed charges.

iv. Commission may allow the prosumers to provide a change over switch before the net meter, so that the prosumers can use the energy from the solar generation in case of the KSEBL grid failure during day time.

v. Commission may allow domestic prosumers to store the energy generated from solar.

(2) Sri. Binu Kumar, Green Energy Solutions, Thripunithara

Different procedures followed for feasibility in different Section Offices. Hence, suggested online application for feasibility. Further, there is no proper guidance from KSEBL officials and they are not aware of the procedures for RE feasibility.

(3) Sri. Reni Varghese, MASTERS (Ministry of Approved Solar Traders) Association

KSEB Ltd not following proper procedure for RE connectivity. Further they suggested online applications shall be made applicable for RE connectivity.

(4) Sri. Sooraj , Wahini Green Technologies

(i) Low voltages issues persist during daytime and no further action from KSEBL.

(ii) Provisions for zero export may be granted so that prosumers can consume the generation during grid failures. The facility available in hybrid inverters.

(iii) Banked energy not showing in electricity bills.

(iv) Consumption and bills details in the case of meter shifting may be intimated to the consumers.

(v) Settlement period to September.

(vi) Vehicle Load function can be adopted.

(vii) Wheeling of electricity across the DISCOMS in the State may be considered.

(viii) DC overloading may be permitted for solar inverters.

(5) Sri. Lijo, Thrissur

He Suggested Malayalam translation of the Regulations issued by the Commission for understanding. Further monthly adjustment in fixed charges of the prosumers by the amount of excess energy banked by them.

(6) Sri. Saji Natarajan

Amount for the excess energy banked by the prosumers may be adjusted in the consequent bills of the prosumers from April, so that the delay in payment can be avoided. Further KSEB Ltd not paying the amount for the excess energy banked by the prosumers as specified timelines. For effecting the payment on each FY KSEBL unnecessarily seeking cancelled cheque. The transparency in billing may be ensured.

(7) Sri. Dhanan Jayan, a retired ISRO scientist

He emphasized the need to increase solar penetration into the grid and to encourage more people to install solar panels. Additionally, he advocated for the promotion of Vertical Axis Wind Turbines (VAWT).

(8) Rajan Menon, State President, Kerala Electrical Licensed Contractors Welfare Association, energy auditor, and trained solar system designer

They mentioned that the Renewable Purchase Obligation (RPO) is achieved through bulk purchases from large-scale producers. It is cited that that 49% of energy is used by domestic consumers and emphasizes the need to calculate loading on the 80,000 transformers in Kerala. Further highlighted that Transmission and Distribution (T and D) losses are high,

and KSEB attempts to meet these losses by charging consumers more, balancing their accounts. IEC62446-1 specifies that voltage increases in the grid can cause inverters to show grid failures, leading to significant power losses (about 67%) due to lapses. They pointed out that maintaining power quality in the grid is crucial to avoid wasting useful power. It is proposed that a 1000W consumer in a 48V DC supply network should include a 48V battery at the transformer side, which can charge when the transformer is underloaded. Hence suggested that that street lights, which use 3.86% of the state's energy, can also be powered from this system, benefiting the poorest communities (28 lakh people in Kerala) by providing free electricity. He criticizes KSEB's lack of scheduling, which leads to the purchase of scheduled power at high prices.

(9) Manoharan Nair

He requested to review the consumer grievance regarding the PM Roof Top Solar Energy project in Kerala. Kindly ensure the State Government refrains from altering policies and notify the Central Government if needed. Your prompt action is requested to prevent undue changes by the State Authorities and promote solar energy adoption.

(10) Mohana Kumar

He proposed that Regulation 56a should not adversely affect domestic consumers. He emphasized that time-of-day (TOD) billing and metering should apply only to consumers with a usage of 20 KW and above, and it needs monitoring. Additionally, he suggested changing the terminology from "net billed electricity" to "net electricity billed" under section 22(2)(3). He also proposed making banking optional and adjusting the billing cycle, but it was explained that billing cycles cannot be altered due to rules set by CERC.

(11) Suraj (Wahni from GREEN Technologies)

All inverters have a zero-export facility, and this should be utilized.

(12) Further, the suggestions received from the stakeholders indicated in Annexure -2 was also reviewed and found to be related to the issues raised in Para (1) to (11) above. Hence not specifically mentioned here.

Analysis and Decision of Commission

The Commission has noted the suggestions of the stakeholders. Since, the suggestions do not pertain to the draft published, it is not permissible to consider such issues as part of this amendment regulations. The control period of the KSERC (Renewable Energy and Net Metering) regulations, 2020 is upto the FY 2024-25. Commission is of the view that these suggestions from the

stakeholders require wider policy consultations and can be considered during; the preparation of the discussion paper and drafting of the RE regulations for the control period starting from FY 2025-26.

27. The Commission published the draft of Kerala Electricity Regulatory Commission (Renewable Energy and Net Metering) (Second Amendment) Regulations, 2024 on 29th January, 2024. The Commission conducted public hearings on 20.03.2024 and 15.05.2024. The format in the draft regulations were modified in the final regulations to the standard format. After due consideration of the comments/ suggestions/ objections received, the Commission has now finalized the Kerala Electricity Regulatory Commission (Renewable Energy and Net Metering) (Second Amendment) Regulations, 2024 and notified on 07.08.2024. This statement of reasons is not a part of the notification, but is to explain the intend and necessity for notification of these Amendment Regulations and to transparently provide the rational for each of the decisions taken on the comments furnished by all the stakeholders.

Sd/-	Sd/-	Sd/-
T. K Jose	**Adv. A. J. Wilson**	**B Pradeep**
Chairman	**Member**	**Member**

Approved for issue

Sd/-

C R Satheeshchandran

Secretary

Annexure-1

List of participants attended the public hearing (In person) on 20.03.2024

1. Sri. Rajan M. P, Deputy Chief Engineer, TRAC, KSEB Ltd
2. Smt. Latha S V, Executive Engineer, TRAC, KSEB Ltd
3. Sri. Asha P. A, Deputy Chief Engineer, REES, KSEB Ltd
4. Smt. Binthu T Wilson, Executive Engineer, REES, KSEB Ltd
5. Sri. Laiju M S, Assistant Executive Engineer, REES, KSEB Ltd
6. Sri. Rakesh P, Assistant Engineer, REES, KSEB Ltd
7. Sri. Nandakumar, KSEBOA
8. Sri. Noushad, AEE, KEOC
9. Sri. Anoop Mathew, KSEBWA (CITU)
10. Sri. Deepu, KSEBWA (CITU)
11. Sri. Sibikutty Francis, KEEC (INTUC)
12. Sri. Sudheerkumar V, KEEC (INTUC)
13. Sri. G. Sivaramakrishnan, KREEPA
14. Sri. Mohammad Fayaz, Moopens Energy
15. Sri. Suhail, Moopens Energy
16. Sri. Sambasivan, Urjamithra State Co-ordinator
17. Sri. Junaid, J& J Technologies
18. Sri. Althaf, J& J Technologies
19. Sri. Tinsu Mathew, ELSOL
20. Sri. Shaju Karichan, District President, AAP
21. Sri. Mohanan Perunthani, AAP
22. Sri. Santhosh Kumar, AAP
23. Sri. Ajithkumar P.C, Residents Association CORWA State General Secretary
24. Sri. P. R Prabhakarn, Ernakulam District Residents Association Apex Council
25. Sri. P J Kuriachan, MASTERS (Ministry of Approved Solar Traders) Association
26. Sri. M A Sathar, EVOK, Trivandrum
27. Dr. Johnson Y, Energy Conservation Society
28. Sri. M Sathar
29. Sri. Wilson
30. Sri. Shaji
31. Sri. George Koshi
32. Sri Prabhakaran Nair
33. Sri. Vinod Kumar B

34. Sri. Jayaprakash S
35. Sri Chandra Sivan
36. Sri. Mohanakumaran Nair
37. Sri. Vimal Prakash
38. Sri. P. G Prathapan
39. Sri. Manoharan Thampi
40. Sri. V A Abraham
41. Sri. T P Ramankutty
42. Sri. Harish R
43. Sri. Shajan K Alex, Kannanmoola
44. Sri. Saji Nadarajan, Kaithamukku
45. Sri. Das Antony V
46. Sri. A Ramalingam
47. Sri. Shylesh G
48. Sri. Thomas Chamakala, Cotton Hill
49. Sri. Sam George, Cotton Hill
50. Sri. George Philip, Peroorkada
51. Sri. P Ajayakumar, Thycaud
52. Sri. C Sreekumar, Thycaud
53. Sri. Punnoose Jacob, Thodupuzha
54. Sri. Reji M George, Ernakulam
55. Sri. K V Kumar
56. Sri. Mahadevan V
57. Sri. Athyakumar
58. Sri. Arun Gopi, Ernakulam
59. Sri. M Sudhakaran
60. Sri. K Krishna Kumar
61. Sri. Vishnu Niranjan
62. Sri. Shibu Chandran
63. Dr P.K. A Sonu
64. Sri. Gokul Krishna
65. Dr. S Narayanan
66. Sri. Hariharan T. M
67. Sri. Akhil
68. Sri. Titto
69. Sri. Jagan

70. Sri. S Anil Kumar
71. Sri. Shiju Purushothaman
72. Sri. Raja Shankar
73. Sri. K. S Kumar
74. Dr. S Sivakumar
75. Sri. Govindan Namboothiri
76. Sri. Unnikrishnan Pillai
77. Sri. M. K Kumaran
78. Sri. R Babu
79. Sri. R. B Subra
80. Sri. P. B Sugathakumar
81. Sri. Harikumar V. R
82. Sri. Biju S. P
83. Sri. Raju Kukkusan
84. Sri. Benny Rajan
85. Sri. Chandran
86. Sri. Sri. Shajilal
87. Dr. George Vargheese
88. Smt Roopa S Nair
89. Sri. Asokan Athikoot
90. Sri. Karunakaran Pillai
91. Sri. Kuriachan
92. Sri. Ayyappan G
93. Sri. Ramesh
94. Sri. Jimmey Carter
95. Sri. Senthil Kumar
96. Sri. Ashok Unnikrishnan
97. Sri. Sujith S
98. Sri. K. A Sugathan
99. Sri. Krishna Kumar
100. Sri. Yatheendran
101. Sri. P Harikumar
102. Sri. Vinod Mathew Wilson
103. Smt Mary
104. Sri. Sreeram
105. Smt Aleena

106. Sri. Binod Jose
107. Sri. G Subhash Nair
108. Sri. V Salimkumar
109. Sri. Kumar C
110. Sri. Prasad
111. Sri. Abhi
112. Sri. Bijuraj R. S
113. Sri. Akhil Ramesh
114. Sri. Anil Kumar
115. Adv. Abin Sheerej Narayan
116. Sri. A.S Ajith
117. Sri. K. R Charles
118. Sri. Abraham Jose
119. Sri. M Mohankumar
120. Sri. Vishnu S
121. Sri. Gopakumar
122. Sri. M Hanees
123. Sri. Thaha A
124. Sri. R Subramaniam
125. Sri. Anulal
126. Sri. K.V Sugunan
127. Sri. K Vijayan
128. Sri. Arun A
129. Sri. Mohan Kumar
130. Sri. Ajith Kumar S U
131. Sri. Narayan Nampoothiri
132. Sri. Subramani
133. Sri. Ansari. G
134. Sri. Vancheswaran
135. Sri. Rejith R. P
136. Sri. Rijith R
137. Sri. Sunil Raj
138. Sri. Sujin M. S
139. Sri. C. V Sreekumar
140. Sri. K.G Ajithkumar
141. Sri. Thomas Saji T. K

142. Sri. Rahul M. A
143. Sri. Kishor Kumar
144. Sri. Vinod T. P
145. Smt S Vineetha
146. Sri. Arun V George
147. Sri. Joseph M. X
148. Sri Babinlal K
149. Sri. Mohan
150. Sri Udayakumar
151. Sri. Alexander P John
152. Sri. Dinesh Kumar D
153. Sri. Anuradh T. R
154. Sri. Padmakumar
155. Sri. Harish N R
156. Sri. Asokh G
157. Sri Dipin Das
158. Sri. Shinod R
159. Sri. Radhakrishnan G
160. Sri. Gopakumar
161. Sri. Balachandran
162. Sri. Noufal
163. Sri. Abdul Jabar M
164. Sri. Vinu K
165. Sri. M R Narayanan
166. Sri. M S Venugopal
167. Sri. Feroz B
168. Sri. Vinod
169. Sri. Madhulal
170. Sri. Mathew C. K
171. Sri. Suresh P.T

List of participants attended the public hearing (Video Conference) on 20.03.2024

1. Sri. Saji Mathew, MRF
2. Sri. Pradeep M, HINDALCO
3. Sri. Jacob Cherian, Malayala Manorama
4. Sri. Nair Nandakumar, HT and EHT Association
5. Sri. Prabhakaran K. V, HT and EHT Association
6. Sri. Shine, KSEB Engineers Association
7. Sri. Sarath, FACT
8. Sri. Renjit Jacob, Apollo Tyres
9. Sri. A. R Satheesh
10. Sri. Radhakrishnan K. R, CUMI
11. Sri. Bose Jacob, InSDES
12. Sri. Jameskutty Francis, Retired Electrical Inspector
13. Sri. Satheeshan Kakkad, Nestro Solar
14. Sri. Kishor Kumar, Kochin Packings
15. Sri. Vijeesh K, Zenster Power Solutions
16. Sri. Sayed Imran, Dehlsen Engineering
17. Sri. Thomas Varghese, ESSIA
18. Sri. Manikuttan. S , NPH Solar
19. Sri. Sibykutty Francis, INTUC
20. Smt. Sruthi S. V, Managing Director, KSINC
21. Sri. Rinson Jacob, Cyber Park
22. Sri. Rahul Rajendran, Energy Fox Consultant
23. Sri. Sambasivan, Urjamithra Team
24. Sri. Dileep, ATS Electrical Engineering
25. Sri. Shaji Sebastaian , IECC
26. Kum. Neenu S Skaria, Kerala State Small Industries Association
27. Sri. Arun C Aby, PTC India Limited
28. Sri. Mathew Joseph, Heveacrumb Rubber Private Limited
29. Smt. Sreela C S, IGTPL
30. Sri. Albin Paul, Zolar Roof Private Limited
31. Sri. Rony Paul
32. Sri. Nageswara A
33. Sri. Suresh Kumar
34. Sri. Aniyan Thadiyoor
35. Sri. Abdul Kalam Azad
36. Sri. Jothish Ben
37. Sri. Vinod Thennali
38. Sri. Liby Philip Mathew
39. Sri. Vino Varghese
40. Sri. Sangeeth P. V
41. Sri. Madhu Kuruvayil Nambiar

42. Sri. Philip Daniel
43. Sri. Saby Chacko
44. Sri. Santhosh Ramachandran
45. Sri. Suresh Babu
46. Sri. John Manohar
47. Sri. Cicy Binu
48. Sri. Neeraj Mathew
49. Sri. Fisal
50. Sri. Mohammad Unais
51. Sri. Vivek Chary
52. Sri. Jayagopal C Pillai
53. Sri. Aanand S Krishna
54. Sri. Kalam V. P.Z
55. Sri. Vijeesh K
56. Sri. Sayed Imran
57. Sri. Thomas Varghese
58. Sri. Manikuttan S
59. Sri. Suresh Babu C. T
60. Sri. Faizal
61. Sri. Muhammed Unais N
62. Sri. Sanal Kumar W
63. Sri. Mohan Jacob
64. Sri. P Rajesh
65. Sri. Anil K G
66. Sri. Anand P. B
67. Sri. Mohammad rafik
68. Sri. Rahul Raj
69. Sri. Tijo Joseph
70. Sri. Vargheese Thomas
71. Sri. Joby Devassy
72. Sri. Deepesh Varma
73. Sri. Vivek Venugopal
74. Sri. Hrishi Shaji
75. Sri. Madan Mohan
76. Sri. Mohammad Asharaf Ambadi
77. Smt. Devika Nair
78. Sri. Mathew Mammen
79. Sri. Raju Kakkasery
80. Sri. Ajai Babu
81. Sri. Shinod R
82. Sri. Philip Thomas
83. Sri. Lijo Varghese

84. Smt. Susamma Philip
85. Sri. Febin Thomas
86. Sri. Madan Mohan
87. Sri. Sooraj Govind
88. Sri.Sathar
89. Sri. Shajan
90. Sri. Ashokan
91. Sri. Prasanth P

List of participants attended the second public hearing on 15.05.2024

1. Sri. Rajan MP, DCE TRAC, KSEB Ltd
2. Sri. Manusenan V, AE, TRAC, KSEB Ltd
3. Smt Latha SV, EE TRAC, KSEB Ltd
4. Sri. Asha AV, AE TRAC, KSEB Ltd
5. Smt. Bindhu T Wilson, KSEB Ltd
6. Sri. Shine Raj, KSEBL
7. Sri. Binu.A.V, Vega Engineering Solutions
8. Sri. Sreekumaran Nair IEKSC
9. Sri. Biji S Nair, Bodhie Solar
10. Sri. Prakash P Prabhu, Kammath Electrical (P) Ltd., Kochi
11. Sri. Francis Anapparambil, Jubilant Consultancy
12. Sri. Amal Dhileep Kumar, Augzet Engineers
13. Sri. Muhammad, Yes Power
14. Sri. Pradosh Kumar KP, Nestro Marketing
15. Smt. Anju NK, Zaintik Power System
16. Sri. Rajesh E K, Zaintik Power System
17. Sri. Alaxander P John, Enin Mobility Pvt Ltd
18. Sri. S Rameshan Nair, Power ECT Systems
19. Sri. Jose Antony, AS Electronics
20. Sri. Mohankumar Association of Solar Energy Society, Neyyattinkara
21. Sri. Rakesh C Nair, Secure Tech Energy Company System
22. Smt. Mikku Kurien, AM Electronics
23. Sri. Prasad P, Mithra Power
24. Sri. Linto NT, BSS Green lite
25. Sri. K Sajeevan, Sakthi Solar Systems
26. Sri. Arun R, AVS Solar
27. Sri. Rajesh Punnadiyil, SR Power Corporation Ottappalam
28. Sri. Sooraj K, MASTERS (Ministry of Approved Solar Traders) Association
29. Sri. Thomas, MASTERS
30. Sri. Noufal Rusar, MASTERS
31. Sri. Abdul Razak, MASTERS
32. Sri. Rosen John, MASTERS
33. Sri. Sreelal, MASTERS
34. Sri. CA Biju, MASTERS
35. Sri. Mujeeb Rahman , MASTERS
36. Sri. Dhileep Kumar CP, MASTERS
37. Sri. Pramod Kumar, MASTERS
38. Sri. Sajan , MASTERS
39. Sri. Mathew Philip, CHHOA Secretary
40. Sri. M Sudhakaran , Secretary, Solar Production Association
41. Sri. Anas V, MNRF Vendor

42. Sri. Gopakumar, MNRF Vendor
43. Sri. Vishnu Prasad K P, MNRE Vendor
44. Sri. Rajesh Thekkan, RAS Solar Power
45. Sri. Sreekanth Mohan, JB Power Electronics
46. Sri. Shihab N.M, Bea Science/ Domestic
47. Sri. Shihab A.H, Matrix Domestic
48. Sri. Sumesh Nair, Sai Solar Systems Pvt Ltd
49. Sri. Aswin Krishnan, Havells India Limited
50. Sri. Prasanth Varghese, Zee Sonic Enterprises
51. Sri. Sunil M Joy, All Sun Energy
52. Sri. Vipin Kumar, Avani Future Ernakulam
53. Sri. Prasad Pullikkal, BSS Green life
54. Sri. A Gopalakrishnan, P & G Manufacturer Industries
55. Sri. Sajeendran , ISRO Retd
56. Sri. Mathew K, ISRO Retd
57. Sri. Hesed Joja, Light Sky International Pvt Ltd
58. Sri. Ramesh BC, Power Solutions
59. Sri. Jamsheed Jasar, Unifrida
60. Sri. Narayanan CS, Drajon Technologies
61. Sri. Anuradh TR, Enin Mobility Pvt Ltd
62. Sri. S Mohammed Salim, Retd. Electrical Inspector
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317. Sri. Shajahan N K,President, Domestic Electricity Consumer Association (DECA)
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598. Smt. Kamala Padmanabhan
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600. Sri. Lijo Ministry Approved Solar Traders, MASTERS (Ministry of Approved Solar Traders) Associations
601. Sri. Tinsu Mathew, ElSol Power Solution
602. Sri. Sreela licensee vallarpadam terminal:
603. Sri. James Kutty Thomas
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606. Sri. Saji Mathew, MRF, HT and EHT Association
607. Sri. Sangeeth
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609. Sri. Shaji Sebastian
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