

**CENTRAL ELECTRICITY REGULATORY COMMISSION
NEW DELHI**

Coram:

Shri P. K. Pujari, Chairperson

Shri I. S. Jha, Member

Shri Arun Goyal, Member

No. RA-14026(11)/4/2020-CERC

Dated 7th July, 2020

In the matter of

Central Electricity Regulatory Commission (Terms and Conditions for Tariff Determination from Renewable Energy Sources) Regulations, 2020 applicable from 1.07.2020 - Statement of Objects & Reasons (SOR) thereof.

STATEMENT OF REASONS

Introduction

(a) The Central Electricity Regulatory Commission (hereinafter referred to as the 'CERC' or 'the Commission') initiated the process of notifying terms and conditions for tariff determination from renewable energy sources for the period from 01.07.2020 to 31.03.2023, in exercise of powers conferred under the Electricity Act, 2003 (hereinafter referred to as the 'the Act' or 'the EA, 2003'). In accordance with Section 61 of the Act, the Commission has to specify the terms and conditions for determination of tariff. Further, in accordance with Section 178(2)(s) of the Act, the Commission is empowered to determine terms and conditions for determination of renewable energy tariff. Accordingly, the Commission, while determining the tariff, takes into account the objectives of safeguarding consumer interest as well as ensuring recovery of the cost of electricity in a reasonable manner.

(b) On April 29, 2020, the Commission issued the Draft Central Electricity Regulatory Commission (Terms and Conditions for Tariff determination from Renewable Energy Sources) Regulations, 2020 (hereinafter referred to as the 'Draft Regulations'), in exercise of the powers vested under Section 61 and clause (s) of sub-section (2) of Section 178 of the Act and all other enabling powers and in compliance of the requirement under sub-section (3) of Section 178 of the Act. The Commission also issued an Explanatory Memorandum accompanying the Draft Regulations wherein it explained the reasons and analysis relied upon for framing the Draft Regulations.



(c) A public notice was issued by the Commission on April 29, 2020 soliciting the views/ suggestions/ objections of the stakeholders on the Draft Regulations by May 28, 2020. In response, the Commission received submissions from forty-eight (48) stakeholders. The list of stakeholders is attached as **Annexure I** to this document. Subsequently, Public Hearing on the Draft Regulations was conducted on June 19, 2020 through video conferencing. The list of stakeholders who presented during the Public Hearing is attached as **Annexure II**.

(d) The Commission, complying with the provisions of the Act and the Electricity (Procedure for Previous Publication) Rules, 2005 proceeded to finalize the CERC (Terms and Conditions for Tariff Determination from Renewable Energy Sources) Regulations, 2020. The Commission considered the comments of the stakeholders on the Draft Regulations, views of the participants in the Public Hearing as well as their written submissions received during and after the Public Hearing. The Regulations have been finalized after due consideration of various issues raised. The analysis of the issues and findings of the Commission thereon are discussed in the subsequent paragraphs.

(e) On June 23, 2020, the Commission has notified the Central Electricity Regulatory Commission (Terms and Conditions for Tariff Determination from Renewable Energy Sources) Regulations, 2020 (hereinafter referred as 'CERC RE Tariff Regulations, 2020') keeping in view the mandate of the Act and the submissions of the stakeholders.

(f) 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 clause-wise, along with the Commission's analysis and ruling on the same. However, in some cases, due to overlapping of the issues/comments, two clauses have been combined in order to minimise repetition. The Commission has also made certain suo-motu consequential changes in order to ensure consistency among clauses.

(g) The main issues raised during the public consultation process, and the Commission's analysis and decisions on the issues, which underlie the Regulations as finally notified, are given in subsequent paragraphs.

1 Definitions and Interpretation

A. Useful Life

Commission's Proposal

1.1 As per Regulation 2(1)(hh) of the Draft Regulations, Useful Life has been proposed as below:

"hh) 'Useful Life' in relation to project, including dedicated evacuation system, from the date of commercial operation of such project, shall mean the following: -

i.	Wind power project	25 years
ii.	Biomass power project with Rankine cycle technology	20 years
iii.	Non-fossil fuel based co-generation project	20 years
iv.	Small hydro Project	35 years
v.	Municipal solid waste based power project/ Refuse derived fuel based power project	20 years
vi.	Solar PV power project/ floating solar project/ Solar thermal power project	25 years
vii.	Biomass gasifier based power project	20 years
viii.	Biogas based power project	20 years
ix.	Renewable hybrid energy project	Minimum of Useful Life of different RE technologies combined for Renewable Hybrid Energy Project
x.	Renewable energy with storage project	Same as Useful Life of project assuming that there is no storage"

Comments Received

1.2 **Venika Hydro Projects Pvt. Ltd** and **GRIDCO** have requested to consider the useful life of small hydro projects as 40 years instead of 35 years.

1.3 **GRIDCO** has also commented that the Commission has already extended the useful life of hydro generating station including pumped storage hydro generating stations to 40 years.

1.4 **Cargo Solar Power (Gujarat) Private Limited** has requested for extension of project life cycle of solar thermal power project from 25 years to 40 years, as the

Banks are considering the loan tenure of 12 years only, which has resulted in moderate economic viability and concern for the lenders to fund the project. Further, it has submitted data on year-wise generation and commissioning of nine Solar Energy Generating Systems (SEGS I to SEGS IX), in order to justify the extension of plant life to 40 years.

1.5 **Rudraksh Energy** has requested the Commission to increase the useful life of biomass power project with Rankine Cycle technology to 30 years, as technique and technology development of operating boilers on different types of biomass has improved.

1.6 **ACME** has requested the Commission to consider the useful life of 35 years for solar PV power project/floating solar project/solar thermal power project, as the warranties of the solar panels have been increased by the supplier to up to 35 years.

1.7 **NTPC** has requested the Commission to consider separately the useful life and other parameters such as O&M expenses of off-shore wind turbine as per OEM recommendations, as useful life of off-shore wind turbine is less than that of on-shore wind turbine.

1.8 **RUMSL** requested to add the provision for useful life of Renewable Hybrid Energy Project with Storage as follows:

“Useful life of Renewable Hybrid Energy Project with Storage: Minimum of Useful Life of different RE technologies combined for Renewable Hybrid Energy project assuming that there is no storage.”

1.9 **Radiance Renewables** suggested that as the useful life of hydro projects is longer than that for wind or solar projects, the useful life of hydro projects in hybrid with wind and solar should not be limited to the lower useful life of RE sources like wind or solar.

Analysis and Decision

1.10 As the technology for Small Hydro Projects (SHP) and large hydro power projects is almost similar, the Commission has decided to change the useful life of SHP from 35 years to 40 years in line with the provision of useful life of 40 years for conventional hydro projects as defined in CERC (Terms and Conditions for Tariff) Regulations, 2019. The same has been reflected in the final regulations.

1.11 As regards the useful life of solar thermal power projects, the operation of solar thermal plants requires turbine, heat exchanger, molten salt, heat transfer fluid, part mechanical and E&I equipment and lot of mechanical components. At present we do not have large database in respect of solar thermal projects. As such, the Commission is of the view that any change in this regard can be considered only

after detailed study. The useful life of solar thermal power project has accordingly been retained as 25 years for the Control Period 2020-23.

1.12 As regards the useful life of biomass power project with Rankine Cycle technology, the Commission has taken into consideration the submission of the stakeholders regarding technology development of operating boilers on different types of biomass projects.

1.13 The Commission is of the view that since the boiler technology used is the same as that of thermal stations, the useful life of Biomass power projects with Rankine Cycle technology, Biomass Gasifier projects, Biogas Projects and Municipal Solid Waste (MSW)/Refuse Derived Fuel (RDF) projects should be revised to 25 years similar to that of thermal power projects. This has accordingly been incorporated suitably in the final regulations.

1.14 As regards the useful life of off-shore wind projects, the Commission is of the view that any change in this regard can be considered only after detailed study.

1.15 As regards the useful life of solar PV power project/ floating solar project/ solar thermal power project, the Commission is of the view that any change in this regard can be considered only after detailed study. As such, the useful life of solar PV power project/ floating solar project/ solar thermal power project has been retained as 25 years as proposed in the Draft Regulations.

B. Definition of Installed Capacity

Commission's Proposal

1.16 As per Regulation 2(1)(n) of the Draft Regulations, the Installed Capacity is defined as follows:

“Installed capacity' or 'IC' means the summation of the name plate capacities of all the units of the generating station or the capacity of the generating station (reckoned at the generator terminals);”

Comments Received

1.17 **Greenko** and **NSEFI** have suggested to include the following provision in the definition of Installed Capacity:

*“.....
In case of Solar PV and Floating Solar PV projects, Installed Capacity shall be a sum of the nameplate capacity (Nominal AC power) of the inverters of the plant.”*

1.18 **ReNew Power** has requested the Commission to consider modification of definition of Installed Capacity as follows:

“....

Provided that for solar PV based generating station Installed Capacity shall mean the summation of the name plate capacities of all the inverters of the generating station”.

Analysis and Decision

1.19 The Commission has considered the suggestions of the stakeholders wherein they have required to provide more clarity to the definition of the Installed Capacity for solar PV projects, by including name plate capacities of inverters. Suitable provision has accordingly been made in the CERC RE Tariff Regulations, 2020.

C. Definition of Floating solar project

Commission’s Proposal

1.20 As per Regulation 2(1)(j) of the Draft Regulations, the floating solar project is defined as follows:

“Floating solar project’ or ‘FPV’ means a solar PV power project where the structure of the project floats on top of a body of water, such as artificial basin or lake, with the help of floater, anchoring and mooring system;”

Comments Received

1.21 **Solar Energy Corporation of India (SECI)** has suggested modification in the definition of Floating solar project or FPV as follows:

*“Floating solar project’ or ‘FPV’ means a solar PV power project where the **arrays of photovoltaic panels** on a structure floats on top of a body of water, such as artificial basin or lake, with the help of floater, anchoring and mooring system”*

Analysis and Decision

1.22 The Commission has modified the definition of floating solar project in the CERC RE Tariff Regulations, 2020.

D. Definition of Small hydro project

Commission’s Proposal

1.23 As per Regulation 2(1)(bb) of the Draft Regulations, the small hydro project is defined as follows:

“Small hydro project’ means a hydro power project with a installed capacity up to and including 25 MW at a single location;”

Comments Received

1.24 **Greenko** and **NSEFI** have suggested modification in the definition of Small hydro project as given below:

*“Small hydro project’ means a hydro power project with a installed capacity up to and including 25 MW, **or as defined by Ministry of Power (MoP), time to time, at a***

single location;”

1.25 They have proposed to include this modification as the Office Memorandum of Ministry of Power (MoP) dated 8th March 2019 considered large hydro Project as “Renewable Energy Sources”.

Analysis and Decision

1.26 The Commission for providing more clarity in the definition of the Small hydro project has decided to include the capacity limits of SHP as defined by Government of India (MoP/MNRE). The definition has accordingly been modified in the CERC RE Tariff Regulations, 2020.

E. Definition of Renewable Energy, Renewable Energy Project and Renewable Energy Sources

Commission’s Proposal

1.27 As per Regulation 2(1)(w) of the Draft Regulations, renewable energy is defined as follows:

“Renewable energy’ or ‘RE’ means the electricity generated from renewable energy sources;”

1.28 As per Regulation 2(1)(x) of the Draft Regulations, renewable energy project is defined as follows:

“Renewable energy project’ means a generating station that produces electricity from renewable energy sources;”

1.29 As per Regulation 2(1)(y) of the Draft Regulations, renewable energy source is defined as follows:

“Renewable energy source’ means renewable source of energy such as water, wind, sunlight, biomass, bagasse, municipal solid waste and other such sources as approved by the MNRE;”

Comments Received

1.30 **GRIDCO** has suggested modification in some definitions under this clause, as given below:

*“Renewable energy’ or ‘RE’ means the **grid quality** electricity generated from renewable energy sources;*

*‘Renewable energy project’ means a generating station that produces **grid quality** electricity from renewable energy sources;”*

1.31 **GRIDCO** has submitted that omitting quality criteria for injection of renewable energy may jeopardize the stability of the Grid by allowing injection of

power at frequency, voltage and waveform other than grid frequency, voltage & waveform (i.e., perfect sinusoidal waveform), respectively, and with injection of harmonics and irrationally high reactive power. Therefore, the criteria of grid quality should be retained in the definition of 'Renewable Energy'.

1.32 **Greenko** and **NSEFI** have suggested modification in the definition of renewable energy source, as given below:

*“Renewable energy source’ means renewable source of energy such as water, wind, sunlight, biomass, bagasse, municipal solid waste, **hybrid/combination of such resources, with or without energy storage system** and all other sources as approved by the MNRE;”*

Analysis and Decision

1.33 The Commission is of the view that the definitions of renewable energy and renewable energy project are adequate and, therefore, it has been decided to retain the definitions as proposed in the Draft Regulations.

1.34 As regards the modification in the definition of renewable energy source, the Commission is of the view that as renewable hybrid energy project is defined separately, which also includes renewable energy hybrid project with storage. Hence, there is no requirement to modify the definition.

F. Definition of Inter-Connection Point

Commission’s Proposal

1.35 As per Regulation 2(1)(o) of the Draft Regulations, the Inter-connection point is defined as follows:

*“**Inter-connection point’** shall mean interface point of renewable energy generating facility with the transmission system or distribution system, as the case may be, and include:*

i. in relation to wind power projects, solar PV power projects, renewable hybrid energy projects and renewable energy with storage Projects, line isolator on outgoing feeder on HV side of the pooling sub-station; and”

Comments Received

1.36 **Solar Energy Corporation of India (SECI)** has suggested the following modification in the definition of Inter-connection point, as the connectivity depends on substation, and the project can be connected either on HV side or LV side:

“Inter-connection point’ shall mean interface point of renewable energy generating facility with the transmission system or distribution system, as the case may be, and include:

- i. in relation to wind power projects, solar PV power projects, renewable hybrid energy projects and renewable energy with storage Projects, line isolator on outgoing feeder on HV/LV side of the pooling sub-station; and
- ii. in relation to small hydro projects, biomass gasifier based power projects, non-fossil fuel based co-generation projects and solar thermal power projects, line isolator on outgoing feeder on HV side of generator transformer."

1.37 **Prozeal Infra Engineering Private Limited** has suggested that interconnection point of renewable hybrid energy projects should be through loop in and loop out (LILO) on same line (11kV/33kV/66kV, etc.), which connects pooling substation or at the generator/ developer's pooling station whose dedicated power transmission/ evacuation line is or shall be terminated at the pooling substation. Further, it has suggested that there should be separate meter installation at wind and solar power generation points.

Analysis and Decision

1.38 The Commission is of the view that no changes are required to be made in the proposed definition. The existing definition specifies that the interconnection point shall be line isolator on outgoing feeder on HV side of pooling station. It is envisaged that the RE projects shall get connected on the HV side. Accordingly, the auxiliary consumption norms have also been specified.

G. Definition of Renewable Hybrid Energy Project

Commission's Proposal

1.39 As per Regulation 2(1) (aa) of the Draft Regulations, the renewable hybrid energy project is defined as follows:

"Renewable hybrid energy project' means a renewable energy project that produces electricity from a combination of renewable energy sources, connected at the same inter-connection point;"

Comments Received

1.40 **Greenko** and **NSEFI** have suggested modification in the definition of renewable hybrid energy project, as given below:

*"Renewable hybrid energy project' means a renewable energy project that produces electricity from a combination of renewable energy sources, **with or without energy storage system**, connected at the same inter-connection point;"*

1.41 **Greenko** and **NSEFI** have proposed to include energy storage system as part of hybrid renewable energy projects as storage devices are essential for firming up of intermittent and variable renewable energy sources.

1.42 **Solar Energy Corporation of India (SECI)** has suggested the following

modification in the definition of renewable hybrid energy project:

“Renewable hybrid energy project’ means a renewable energy project that produces electricity from a combination of renewable energy sources, connected at the same inter-connection point or multiple interconnection points.”

1.43 **ReNew Power** has requested to consider inclusion of definition of non-colocated hybrid projects. The proposed definition is as follows:

“Non-Colocated Hybrid Projects means a special class of hybrid projects where developers are allowed to put up RE projects at different locations against a single Power Purchase Agreement.”

1.44 **Power Company of Karnataka Limited (PCKL)** and **Karnataka Power Transmission Corporation Limited (KPTCL)** have suggested to consider addition of provision in the definition of renewable hybrid energy project as follows:

“

Such that, rated capacity of generation from one RE source is at least 25% of the rated capacity of the generation from other RE source.”

Analysis and Decision

1.45 The Commission has noted the suggestions regarding modification in definition of RE hybrid project and is of the view that no change is required in definition as the renewable energy with storage project is defined separately, which includes renewable energy project with storage or a combination of renewable hybrid energy project with storage.

1.46 As regards consideration of multiple injection points, it is noted that the objective of RE hybrid project is to use the combination of two or more RE technologies and provide comparatively more steady power supply to the buyer at increased capacity utilisation factor (CUF) by using intermittent generation from RE technologies. If the two RE projects located at multiple sites are allowed to inject generation at multiple locations, then this objective of supplying steady power will not be achieved. Further, generation at multiple points will require separate settlement mechanism. The Commission is of the view that it may lead to complexity and has decided not to allow the same. Hence, the definitions proposed in the Draft Regulations have been retained.

1.47 As regards the suggestion of adding rated capacity of the renewable hybrid energy project, the Commission observes that it has already been mentioned in the eligibility criteria for renewable hybrid energy project. Hence, there is no need to include the same in the definition.

H. Definition of pumped storage hydro project, renewable energy with storage



project and storage

Commission's Proposal

1.48 As per Regulation 2(1)(u) of the Draft Regulations, pumped storage hydro project is defined as follows:

"Pumped storage hydro project' means a hydro power project which generates power through energy stored in the form of water energy, pumped from a lower elevation reservoir to a higher elevation reservoir;"

1.49 As per Regulation 2(1)(z) of the Draft Regulations, renewable energy with storage project is defined as follows:

"Renewable energy with storage project' means a combination of renewable energy project with storage or a combination of renewable hybrid energy project with storage at the same inter-connection point;"

1.50 As per Regulation 2(1)(ff) of the Draft Regulations, storage is defined as follows:

"Storage' means energy storage system utilizing methods and technologies like, solid state batteries, flow batteries, pumped storage, compressed air, or any other technology, to store various forms of energy and deliver the stored energy in the form of electricity;"

Comments Received

1.51 ACME has suggested the following modification in the definition of storage as hydrogen and fuel cell based power generation is advancing towards commercial viability:

"Storage' means energy storage system utilizing methods and technologies like, solid state batteries, flow batteries, fuel cells, hydrogen storage, pumped storage, compressed air, or any other technology, to store various forms of energy and deliver the stored energy in the form of electricity;"

1.52 GRIDCO has suggested modification in the definition of pumped storage hydro project, as given below:

*"Pumped storage hydro project' means a hydro power project which generates power through energy stored **as potential energy, in the form of water** pumped from a lower elevation reservoir to a higher elevation reservoir;"*

1.53 ACME has proposed the following modification in the definition of renewable energy with storage project and renewable hybrid energy project:

"Renewable energy with storage project' means a combination of renewable energy

*project with storage or a combination of renewable hybrid energy project with storage at a **single or multiple** inter-connection points where the power from the Project(s) is injected into the identified ISTS substation(s);*

*'Renewable hybrid energy project' means a renewable energy project that produces electricity from a combination of renewable energy sources, connected at a **single or multiple** inter-connection points where the power from the Project(s) is injected into the identified ISTS substation(s);'*

1.54 ACME has submitted that the location of renewable energy projects is highly dependent upon the geographical location and availability of radiation, wind, water head, etc., and it may not be necessary that all or few of them are co-located at the same place. For efficient utilization of renewable energy resources and at the same time to supply power at low cost, the configuration and location of individual project components (either co-located or multi-located) should be left to the project developer. Hence, the inter-connection point should be a single point or multiple points, where the power from the project(s) is injected into the identified ISTS substation(s).

Analysis and Decision

1.55 The Commission accepts the suggestion regarding inclusion of fuel cells and hydrogen storage in the definition of storage and the CERC RE Tariff Regulations, 2020 has suitably incorporated this suggestion.

1.56 The Commission accepts the suggestion regarding modification in the definition of pumped storage hydro project and the CERC RE Tariff Regulations, 2020 has suitably incorporated this suggestion.

1.57 As regards the consideration of multiple injection points, the Commission is of the view that it may lead to complexity and may create disputes with beneficiaries. Hence, the definition is retained as proposed in the Draft Regulations.

I. Proposal for inclusion of definition for infirm power

1.58 GRIDCO has suggested including the definition of 'Infirm Power', as given below:

"'Infirm Power' means electricity injected into the grid prior to the date of commercial operation of a unit of the generating station in accordance with Central Electricity Regulatory Commission (Grant of Connectivity, Long-term Access and Medium-term Open Access in inter-State Transmission and related matters) Regulations, 2009;"

1.59 GRIDCO has submitted that the generator may need to inject power into the Grid for testing and commissioning purposes and energy injected prior to

commencement of commercial operation cannot be treated at par with energy scheduled post-COD. Therefore, 'Infirm Power' should be defined along with the mechanism for treatment of the same in compliance with CERC DSM Regulations.

Analysis and Decision

1.60 The Commission is of the view that the concept of infirm power is a subject matter of the Grid Code and is accordingly beyond the scope of present regulations.

J. Proposal for Inclusion of Definition of COD

1.61 **GRIDCO** has suggested including the definition of 'Date of Commercial Operation' or 'COD', as given below:

“Date of Commercial Operation’ or ‘COD’ shall have the same meaning as defined in the Grid Code as amended from time to time;”

1.62 It has submitted that the term COD has been used in several instances in the Draft Regulations but has not been defined. Further, present CERC (Indian Electricity Grid Code) Regulations, 2010 i.e., IEGC-2010, does not specify standards/procedures for declaration of COD source-wise, e.g., solar projects, wind projects, biomass projects. Hence, it has requested to specify the definition along with appropriate amendment in IEGC-2010 specifying required tests prior to trial run for declaration of commercial operation.

Analysis and Decision

1.63 The Commission is of the view that there is no requirement to define COD in these Regulations as definition of COD is subject matter of the Grid Code. It may be noted that in the Tariff Regulations for conventional energy sources also, the definition of date of commercial operation only mentions that it shall be as defined in Grid Code.

2 Scope and extent of application

Commission’s Proposal

2.1 The scope and extent of application of these Regulations were proposed as under as per Regulation 3 of the Draft Regulations:

“3. Scope and extent of application

These regulations shall apply to cases where tariff for a grid connected generating station or a unit thereof commissioned during the Control Period and based on renewable energy sources, is to be determined by the Commission under Section 62 read with Section 79 of the Act:

Provided that in cases of wind power projects, small hydro projects, biomass power project with Rankine cycle technology, non-fossil fuel based co-generation projects, solar PV

power projects, floating solar projects, solar thermal power projects, renewable hybrid energy projects, renewable energy with storage projects, biomass gasifier based power projects, biogas based power projects, municipal solid waste based power projects and refuse derived fuel based power projects, these regulations shall apply subject to the fulfilment of eligibility criteria specified in Regulation 4 of these Regulations.”

Comments Received

2.2 **GRIDCO** has suggested to include the following provision in the scope of these Regulations as the Draft Regulations include the procedure for determination of project specific tariff for renewable energy projects, where tariff from such renewable energy sources is generally determined through competitive bidding process in accordance with provisions of Section 63 of the Act.

“Provided that project specific tariff for renewable energy projects, where tariff from such renewable energy sources is determined through competitive bidding process in accordance with provisions of Section 63 of the Act, shall be vetted and approved by the Commission.”

2.3 **Gujarat Biomass Energy Developers Association** has suggested that the applicability of these Regulations should not be linked to commissioning of the project in the Control Period, rather it should be based on the projects having achieved financial closure and commencement of construction works in the Control Period, in order to provide sustainable development, mitigate uncertainty, and also safeguard the development of the RE projects.

2.4 **PCKL and KPTCL** have requested to clarify the applicability of the Regulations and subsequent Tariff Orders, because as per Tariff Policy, all procurement has to be done through tariff based competitive bidding only and the generic tariff will be only ceiling price. Further, the stakeholders sought reasoning for the requirement of case specific tariff determination.

Analysis and Decision

2.5 The project specific tariff for projects awarded under Section 63 of the Act shall not be determined under these Regulations, as tariff discovered through competitive bidding is only adopted by the Commission.

2.6 Applicability of the Regulations shall be linked to commissioning of the project only and not with the financial closure and commencement of construction of the project. In case the project achieves financial closure in this Control Period and gets commissioned later on, say, after 5 years, then it would not be appropriate to apply the principles of tariff determination for the project achieving financial closure in this Control Period.

2.7 As regards the applicability of the Regulations and subsequent Tariff Orders,



the provisions in the Draft Regulations are quite clear.

3 Eligibility criteria

Commission's Proposal

3.1 The eligibility criteria were proposed as under as per Regulation 4 of the Draft Regulations:

"4. Eligibility Criteria

.....

e) Solar PV power project, floating solar project and solar thermal power project – The project is based on technologies approved by MNRE.

Provided that floating solar project installed with existing renewable energy project shall be treated as renewable hybrid energy project

f) Renewable hybrid energy project – The rated capacity of generation from one renewable energy source is at least 25% of the rated capacity of generation from other renewable energy source(s) and operate at the same point of interconnection.

.....

k) Renewable energy with storage project – The renewable energy project including renewable hybrid energy project that uses, partly or fully, renewable energy generated from such project to store energy into storage facility which is connected at the same point of interconnection as the renewable energy project."

Comments Received

3.2 **SECI** has suggested the following modification in the eligibility criteria of renewable hybrid energy project to reflect the scope for multiple injection points for hybrid projects:

*"Renewable hybrid energy project – The rated capacity of generation from one renewable energy source is at least 25% of the rated capacity of generation from other renewable energy source(s) and operate at the same **and multiple** point of interconnection."*

3.3 **ACME** has suggested the following modification in the eligibility criteria of renewable energy with storage project:

"Renewable energy with storage project – The renewable energy project including renewable hybrid energy project that uses, partly or fully, renewable energy generated from such project to store energy into storage facility which is connected at a single or multiple inter-connection points where the power from the Project(s) is injected into the identified ISTS substation(s);"

3.4 **NTPC** submitted that as there is no difference in the technology of power generation between floating solar PV power project and solar PV power project

(ground mounted), the combination of two should be excluded from the scope of renewable hybrid energy project.

3.5 **Dr. Anoop Singh, IIT Kanpur** has requested to clarify scope of hybrid RE projects and their definition in case of more than 2 technologies. Further, he sought clarification as to whether co-generation with hybrid RE technology would also fall within the scope of hybrid RE projects. He has requested to clarify scope of storage based RE (hybrid) projects and minimum storage capacity with respect to the rated 'energy' capacity of the RE plants.

Analysis and Decision

3.6 In the CERC RE Tariff Regulations, 2020, the Commission has exclude the combination of solar PV project (ground mounted) and floating solar from the scope of renewable hybrid energy projects.

3.7 In the CERC RE Tariff Regulations, 2020, clarity as regards interconnection point for renewable hybrid energy project has been brought about.

3.8 However, as regards consideration of multiple injection points, the Commission is of the view that it may lead to complexity and has decided not to allow the same.

3.9 As regards the scope of RE Hybrid Project, it is clarified that it uses the combination of two or multiple RE technologies connected and injecting power at the same interconnection point. The eligibility criteria is specified as the rated capacity of generation from one renewable energy source should be at least 25% of the rated capacity of generation from other renewable energy source(s), which operate at the same point of interconnection. In case of multiple RE technologies, such criteria shall be fulfilled by either of the RE technologies.

3.10 RE with storage project means a combination of renewable energy project with storage or a combination of renewable hybrid energy project with storage at the same inter-connection point. The Commission has not specified the limit on capacity of storage to be installed. It is envisaged that technology of battery and capacity of ESS shall be decided by the RE generator based on the application of project.

Chapter 1: General Principles

4 Control Period

Commission's Proposal

4.1 The Control Period was proposed as under as per Regulation 5 of the Draft Regulations:



“5. Control Period

The Control Period under these Regulations shall be from 1.7.2020 to 31.3.2023:

Provided that the tariff determined as per these regulations for the RE projects commissioned during the Control Period, shall remain valid for the tariff period;

Provided further that the tariff norms specified in these regulations shall continue to remain applicable until notification of the revised norms through subsequent re-enactment of these regulations.”

Comments Received

4.2 **Shree Ganesh Edibles (P) Ltd.** has requested to clearly provide that the generic tariff of the year in which the project will be commissioned (scheduled date of commissioning approved by the State Nodal Agency while approving the DPR) will be applicable for the project and PPA need to be drafted accordingly.

4.3 **Greenko** and **NSEFI** have requested to reinstate the following proviso as per the RE Regulations, 2017:

“Provided also that the revision in Regulations for next Control Period shall be undertaken six months prior to the end of the first Control Period and in case Regulations for the next Control Period are not notified until commencement of next Control Period, the tariff norms as per these Regulations shall continue to remain applicable until notification of the revised Regulations subject to adjustments as per revised Regulations.”

4.4 **IWTMA** has suggested to extend the Control Period to 5 years, i.e., till 31.03.2025, as longer Control Period will give regulatory certainty and increase investor confidence.

4.5 **Gujarat Biomass Energy Developers Association** has requested to allow the annual escalation on energy or variable charges till the new tariff is determined for the Control Period. Further, it has submitted that in case continuation of escalation on energy or variable charges is not provided, then adjustment of tariff should be allowed with respect to the tariff finalised for the new Control Period with effect from the expiry date of the old Control Period.

4.6 **Bask Research Foundation** suggested to conduct an annual review of norms specified in the Regulations to capture real prices, for ensuring efficient and optimal tariffs for the developers and consumers. Further, it sought clarity on applicability of previously determined tariff (under previous Regulations) in case of delay in tariff determination by the Commission.

4.7 **GRIDCO** has requested to clarify the applicability of tariff in case of projects for which the conceptualization and investment is done during the Control Period of

CERC RE Tariff Regulations, 2020 and commercial operation of the same is after the end of the Control Period.

Analysis and Decision

4.8 As regards extension of the Control Period, the Commission is of the view that under the current market scenario where technologies evolve very fast, with improving equipment efficiency and decreasing prices, 5 years is too long a Control Period. For example, price of utility scale solar PV has dropped by over 60% over last 5 years. Thus, the Commission has decided to retain the Control Period upto 31.03.2023 as specified in the Draft Regulations.

4.9 The Commission has clearly specified in the Draft Regulations that in case of delay in notification of Regulations for the next Control Period, the current notified Regulations will be applicable. Hence, the Commission finds no reason to allow any escalation on variable or energy charges.

4.10 The Commission is of the view that the norms have been specified considering the present market trends and for providing regulatory certainty to the investors, it is necessary to provide norms for a period of three years and hence, annual revision to norms is not required.

4.11 The Commission has already clarified that the CERC RE Tariff Regulations, 2020 shall be applicable only for RE projects that are commissioned during the Control Period, and shall not be applicable for projects that have achieved financial closure or even where investment has been made.

5 Generic tariff

Commission's Proposal

5.1 The generic tariff was proposed as under as per Regulation 6 of the Draft Regulations:

"6. Generic Tariff

The generic tariff shall be determined by the Commission on annual basis in accordance with these Regulations for the following types of renewable energy projects:

- a) Small hydro project;*
- b) Biomass power project with Rankine cycle technology;*
- c) Non-fossil fuel based co-generation project;*
- d) Biomass gasifier based power project; and*
- e) Biogas based power project."*

Comments Received

5.2 **Shree Ganesh Edibles Pvt. Ltd.** has requested to consider the tariff for co-generating plants as Feed-in-Tariff so that there is compulsion on the part of Discoms to purchase power at such tariff and this will avoid the time wasted on negotiations and arm twisting of the project developers. It has requested to determine separate generic tariff for biomass-based cogeneration plants as the capital cost for biomass/ rice straw based cogeneration plants is higher than that of bagasse based cogeneration plants.

5.3 **ACME** has requested the Commission to determine generic tariff for solar PV projects and wind projects, which shall be considered as ceiling tariff for all the competitive bids conducted in that respective year to ensure competitiveness and transparency in competitive bids.

5.4 **Indian Wind Power Association (IWPA)** has requested to determine generic tariff for wind power projects of less than 25 MW in order to provide regulatory support and visibility to the investors who want to install small scale RE based projects, as the small scale RE based projects are not allowed to participate in the competitive bidding and large scale projects will have a clear advantage in terms of economies of scale and control over the resources and technology. Moreover, this generic tariff will act as a benchmark tariff for SERCs for determining tariff for small projects of less than 25 MW. Further, the stakeholder commented that non-determination of tariff for such small wind power generators will be a discrimination vis-à-vis big players as the small players will not be able to invest in wind energy generation.

5.5 **NTPC** has requested to compute levelized Tariff for off-shore wind projects.

Analysis and Decision

5.6 The Commission has noted the suggestions for determination of separate generic tariff for biomass based cogeneration plants. However, the Commission is of the view that any change in this regard can be considered only after detailed study.

5.7 As regards determination of generic tariff for solar PV projects and wind projects, the Commission is of the view that under the prevailing market conditions, when most of the solar and wind projects are being set up primarily through competitive bidding, determination of generic tariff based on norms will not provide right price signals. In any case, the option of project specific tariff for wind and solar PV projects with appropriate justification is available in the CERC RE Tariff Regulations, 2020.

5.8 Further, the Commission after taking into consideration the comments of the

stakeholders regarding the applicability of tariff, has clarified in the CERC RE Tariff Regulations, 2020 that the generic tariff determined for the year, in which RE project is commissioned, shall be applicable for such RE Project and shall remain valid for the tariff period.

6 Project Specific tariff

Commission's Proposal

6.1 Project specific tariff was proposed as under as per Regulation 7 of the Draft Regulations:

"7. Project Specific Tariff

- a) *Project specific tariff, on case to case basis, shall be determined by the Commission for the following types of renewable energy projects:*
 - i. *Solar PV power projects, floating solar projects and solar thermal power projects;*
 - ii. *Wind power projects (both on-shore and off-shore);*
 - iii. *Biomass gasifier based power projects and biogas based power projects – if a project developer opts for project specific tariff;*
 - iv. *Municipal solid waste based power projects and refuse derived fuel based power projects;*
 - v. *Renewable hybrid energy projects;*
 - vi. *Renewable energy with storage projects; and*
 - vii. *Any other project based on new renewable energy sources or technologies approved by MNRE.*

- b) *Financial and operational norms specified in these regulations, except for capital cost shall be the ceiling norms while determining the project specific tariff."*

Comments Received

6.2 **Enel Green Power India Pvt. Ltd.** has requested to consider the determination of generic tariff instead of project specific tariff for wind power projects as in generic tariff, the developer has a comfort and flexibility to adjust high cost in any of the aspects with any other tariff parameter, whereas in project specific tariff that flexibility is not available at developer's end. Further, the stakeholder has cited the example of Karnataka Electricity Regulatory Commission, which has approved generic tariff for wind projects to be commissioned in FY 2020-21 and similar practice is expected to be continued in the years to come. Also, such generic tariff would be useful to arrive at the floor and forbearance price of RECs as considering a bid determined tariff is not appropriate and at times may be mistakenly skewed.

6.3 **Bask Research Foundation** suggested to exclude wind, solar and solar-wind



hybrid from the scope of Regulations, or at least allow project specific tariff determination for solar, wind and solar-wind hybrid projects only in exceptional cases, and such case must be defined in the Regulations. Additionally, the Commission should specify cases in which it will allow project specific tariff where competitive bidding is feasible.

6.4 **ACME** has requested to remove the provision of project specific tariff at least for solar and wind projects including their storage projects, as this provision will act as perverse incentive to enter into contract with certain influential companies including Public Sector Companies to conveniently justify their projects as “specific” and this will discourage private developers to work towards lowering the tariff.

6.5 **Rewa Ultra Mega Solar Limited (RUMSL)** requested to not consider the specified financial and operational norms as ceiling norms for parameters while determining the project specific tariff, as project specific tariff may have different operational and financial terms based on the nature of the project, fuel, technology, location, procurers, etc. Since many States are following CERC norms while determining tariff parameters for generic tariff or while determining project specific tariff, it may so happen that projects become unviable due to such ceiling norms.

6.6 **Indian Wind Turbine Manufacturers Association (IWTMA)** has requested to propose National Feed-in-Tariff (FiT) for wind power projects below 25 MW as the project of certain capacities are only allowed to participate in the competitive bidding, i.e., 50 MW and above for Central and 25 MW and above for State. Further, it has cited MNRE letter dated 12th January 2018 where MNRE has already written to States for determination of Feed-in-Tariff (FiT) through State Electricity Regulatory Commissions for projects below 25 MW and also cited following GERC policy:

“Tariff applicable under this policy shall be as per following mechanism:

The tariff for these projects should be 20 paisa above the tariff contracted in the competitive bidding process conducted by GUVNL at which PPAs are signed for procurement of Solar Power Projects”.

6.7 **Ramky Enviro Engineers Limited** has requested to not consider tariff determination of municipal solid waste (MSW) and refuse derived fuel (RDF) projects under project specific tariff or under competitive bidding. It has proposed determination of a single tariff for all waste-to-energy (WTE) projects in the country for a period of at least 10 years.

6.8 **PCKL and KPTCL** have sought clarity on the purpose of determination of project specific tariff, as all power purchases have to be made based on Tariff Based Competitive Bidding (TBCB) as per Tariff Policy.

6.9 **Hyderabad MSW Energy Solutions Pvt. Limited** has requested to not encourage Tariff Based Competitive Bidding for WTE projects.

Analysis and Decision

6.10 The Commission has received mixed views on the tariff determination for solar and wind through generic tariff, project specific tariff and competitive bidding process.

6.11 Most of the Utilities are adopting competitive bidding route for procurement of power from solar and wind power projects. In some cases, it is observed that the tariff determination has been done by SERCs on case to case basis, which lead to the inclusion of solar power projects and wind power projects under project specific tariff. Further, the solar power and wind power have reached maturity level and hence, the market driven determination of tariff needs to be promoted. Also, whether or not to determine tariff based on competitive bidding process is beyond the scope of these Regulations.

6.12 Norms excluding capital cost are to be considered as ceiling norms. If all the norms are finalized while determining the project specific tariff, then the purpose of notifying these Regulations will be lost. Hence, it is necessary to specify the financial and operational norms as ceiling norms for parameters, while determining the project specific tariff.

6.13 As regards waste-to-energy projects, the Commission has noted the suggestions. Considering various inherent and State-specific issues involved in waste-to-energy projects, and with due regard to the fact that bids are being invited in some States for setting up such projects, it will not be appropriate at this stage to specify the generic tariff for waste-to-energy projects. However, there is a window for project specific tariff for such projects.

7 Petition and proceedings for determination of tariff

Commission's Proposal

7.1 The Petition to be filed and Proceedings for determination of Tariff were proposed as under as per Regulation 8 of the Draft Regulations:

"8. Petition and Proceedings for determination of Tariff

In case of renewable energy projects for which generic tariff has to be determined as per these regulations, the Commission shall determine such generic tariff through a Generic Tariff Order at least one month before the commencement of year for each year of the Control Period:

Provided that for first year of Control Period i.e., from 1.7.2020 to 31.3.2021, the



Generic Tariff Order shall be issued prior to 30.6.2020

(2) A petition for determination of project specific tariff shall be accompanied by such fee as may be specified in the Central Electricity Regulatory Commission (Payment of Fees) Regulations, 2012 as amended from time to time or any subsequent re-enactment thereof, and shall be accompanied by:

a) Information in forms 1.1, 1.2, 2.1 and 2.2, as the case may be, as appended to these regulations;

b) Detailed project report outlining technical and operational details, site specific aspects, basis for capital cost, detailed break-up of capital cost and financing plan;

c) A statement of all applicable terms and conditions and anticipated expenditure for the period for which tariff is to be determined;

d) A statement containing details of calculation of any grant or subsidy or incentive received, due or assumed to be due, from the Central Government or State Government or both. This statement shall also include the proposed tariff calculated without such subsidy or incentive;

e) Consent from beneficiary for procurement of power from renewable energy project at tariff approved by the Commission, in the form of initialled Power Purchase Agreement or Memorandum of Understanding; and

f) Following documents in case of petition for determination of project specific tariff by renewable energy projects, where tariff from such renewable energy sources is generally determined through competitive bidding process in accordance with provisions of Section 63 of the Act:

i. Rationale for opting project specific tariff instead of competitive bidding; and

ii. Competitiveness of the proposed tariff vis-à-vis tariff discovered through competitive bidding/ tariff prevalent in the market.

g) Any other information directed by the Commission.

(3) The proceedings for determination of tariff shall be in accordance with the provisions of the Conduct of Business Regulations.

Comments Received

7.2 **Greenko** and **NSEFI** requested the Commission not to introduce the clause regarding the requirement of consent from the beneficiary, as conditions like prior PPA or MoU should not be mandatorily required for tariff determination, as generally developer approaches the beneficiary after determination of tariff. Further, the tariff has to be determined based on the Petition filed by the Petitioner along with fee as per CERC (Payment of Fees) Regulations, 2012.

7.3 **Bask Research Foundation** requested the Commission to consider capital cost and completion period submitted by the developer for project specific tariff determination, as envisaged during financial closure and submitted to authorities as the baseline, and allow necessary deviations only after prudence check while determining project specific tariff.

7.4 **NTPC** submitted that the provision requiring the submission of the initialled PPA, documents like rationale for opting for project specific tariff for determination of tariff for solar PV/wind project, etc., will discourage the growth of RE power as a tool for tariff rationalization, as there are various power contracts emerging for supply of RE power blended with thermal power supply, e.g., round the clock (RTC) supply contracts. Such schemes/ contracts are win-win for both RE and thermal power as the issue of RE intermittency is addressed by thermal power and lowering of pooled cost makes thermal power affordable. NTPC requested to provide an enabling provision for tariff determination for such RE projects wherein the supply is to be made against existing PPAs/ contracts.

Analysis and Decision

7.5 The Regulations already have provisions for considering necessary deviation in capital cost and completion period (submitted for tariff determination in case of a project specific project) based on due diligence.

7.6 The Commission has made it mandatory that the initialled PPA with beneficiary is submitted so that the tariff is determined only when beneficiary is ready to procure power at the tariff determined by the Commission. Further, the procurement through competitive bidding has reduced the cost of renewable power. Hence, project specific tariff determination will be a special case.

7.7 Additional information such as rationale for opting for project specific tariff and competitiveness of proposed tariff with tariff discovered through competitive bidding has to be submitted by the project developer to justify its case for project specific tariff determination.

7.8 The Commission after considering the implications on the change in useful life for various renewable energy technologies and differential tax rates for grossing up of return on equity has updated the Forms 1.1, 1.1, 2.1, 2.2 and added Form 2.3 for small hydro power projects with useful life of 40 years.

8 Tariff Structure

Commission's Proposal

8.1 Tariff structure, i.e., the components of tariff were proposed as under as per Regulation 9 of the Draft Regulations:



“9. Tariff Structure

The tariff for renewable energy sources shall consist of the following components:

- (a) Return on equity;*
- (b) Interest on loan;*
- (c) Depreciation;*
- (d) Interest on working capital; and*
- (e) Operation and Maintenance expenses;*

Provided that for renewable energy projects having fuel cost component, like biomass gasifier based power projects, biogas based power project, non-fossil fuel based cogeneration projects and refuse derived fuel based power projects, single part tariff with two components, fixed cost component and fuel cost component, shall be determined.”

Comments Received

8.2 RUMSL requested to modify the existing proviso in the tariff structure as follows:

“.....

*Provided that for renewable energy projects having fuel cost component, like biomass gasifier-based power projects, biogas-based power project, non-fossil fuel-based cogeneration projects and refuse derived fuel-based power projects, **two part tariff**, shall be determined.”*

8.3 RUMSL has submitted that two-part tariff regime is required for projects under the ambit of Merit Order Dispatch principle. Majority of the States are determining two components separately based on parameters but providing only single part tariff. However, single part tariff with two components does not make it a single part tariff, if fuel cost changes annually.

Analysis and Decision

8.4 Only single part tariff is determined for biomass based Rankine power projects, biomass gasifier-based power projects, biogas-based power projects, non-fossil fuel-based cogeneration projects and refuse derived fuel-based power projects, as the tariff recovery of the same is based on energy generated and recovery of fixed charges is not linked to availability of the plants. Hence, the Commission has decided to retain the provisions proposed in the Draft Regulations.

9 Tariff Design

Commission’s Proposal



9.1 Tariff design for generic tariff and project-specific tariff was proposed as under as per Regulation 10 of the Draft Regulations:

“10. Tariff Design

(1) The generic tariff shall be determined, on levelized basis, considering the year of commissioning of the project, for the tariff period of the project:

Provided that for renewable energy projects having single part tariff with two components, fixed cost component shall be determined on levelized basis considering the year of commissioning of the project while fuel cost component shall be determined on year of operation basis in the Tariff Order to be issued by the Commission.

(2) For the purpose of levelized tariff computation, discount factor equivalent to post-tax weighted average cost of capital shall be considered.

(3)The above principles shall also apply for project specific tariff.”

Comments Received

9.2 **Greenko** and **NSEFI** requested to consider discount factor equivalent to pre-tax weighted average cost of capital for the purpose of levelized tariff computation. They further submitted that if formula for levelization used by the Commission with discount factor as post tax Weighted Average Cost of Capital (WACC) of 10.29% is used, it is not possible to achieve the post-tax equity Internal Rate of Return (IRR) as guaranteed to the developers, i.e., 14%. Further, pre-tax WACC should be computed for each of the 25 years of the project life as per the following formula:

Pre-Tax Weighted Average Cost of Capital for year N =

Rate of Interest on Loan x Average Loan for year N x Weightage of Loan in Total Capital in year N + Pre-Tax Return on Equity x Weightage of Equity in Total Capital in year N

9.3 **The Tata Power Company Ltd.** has suggested to remove the factor of (1-Corporate Tax Rate) in WACC computation methodology as it is already under tax shield in regulated environment. Further, it cited the example of a consultation paper on ‘Regulatory Philosophy and Approach in Economic Regulation of Air Navigation Services’ issued by Airports Economic Regulatory Authority of India dated 26th February, 2010 and Airports Economic Regulatory Authority of India Order dated 20th April, 2012 in order to propose change in determination of WACC by Vanilla WACC mechanism.

9.4 **Ramky Enviro Engineers Limited** has requested to consider discount rate of 13.2% for WTE projects.

9.5 **Radiance Renewables** has requested to provide RE generators some assured

revenue against making their capacity available on the Grid and to mitigate their risk.

Analysis and Decision

9.6 The Commission has consistently followed the practice of single discount factor and applied it on year on year cost to arrive at the levelized tariff and is of the view that the methodology is adequate. As regards the comment on pre-tax vs. post tax WACC, while taking the investment decision, the developer considers post-tax WACC as the discount rate to post-tax incremental cash flows to arrive at the NPV of the project.

9.7 Further, the Commission has been following the same methodology while computing the discount rate for competitive bidding projects for evaluation of bids. Hence, the Commission has decided to retain the provisions of tariff design as specified in the Draft Regulations.

10 Treatment for Over-Generation

Commission's Proposal

10.1 The treatment for over-generation was proposed as under as per Regulation 11 of the Draft Regulations:

"11. Treatment of Over-Generation

In case a renewable energy project, in a given year, generates energy in excess of the capacity utilization factor or plant load factor, as the case may be, specified under these Regulations, the renewable energy project may sell such excess energy to any entity, provided that the first right of refusal for such excess energy shall vest with the concerned beneficiary. In case the concerned beneficiary purchases the excess energy, the tariff for such excess energy shall be 75 percent of the tariff applicable for that year."

Comments Received

10.2 **Venika Hydro Projects Pvt. Ltd** has requested to keep the tariff for sale of excess energy above 85% CUF equivalent to tariff applicable for that year.

10.3 **Mangal Industries Ltd.** suggested that the applicability of incentive for generation beyond CUF should be given to Generator as more CUF means more efficiency of generating plant. Further, it sought reasoning for providing incentives to beneficiary for receiving excess energy from the generator.

10.4 **Shree Ganesh Edibles Pvt. Ltd.** has requested to exempt the co-generation plants from the provisions of treatment of over-generation and consider the generic tariff payment for over-generation.

10.5 **HPPA and Bonafide Himachalies Hydro Power Developers Association** have requested to exclude SHP from this Regulation as CUF of SHP is dependent on

water availability, which depends on the weather conditions and source of the stream. In addition, lot of development takes place in the catchment area resulting in reduced water availability, causing reduced CUF of the project during its useful life.

10.6 **Greenko** and **NSEFI** have requested that treatment of excess generation should not be dealt in Tariff Regulations as procurement of excess generation is the contractual obligation under Power Purchase Agreement “PPA” executed with procurer. Further, the stakeholders proposed that the relevant State beneficiaries should be instructed to provide No Objection Certificates for sale of excess generation expeditiously since the generation of excess renewable energy cannot be controlled.

10.7 **ACME** has requested to consider 100% tariff recovery for sale of excess energy.

10.8 **ReNew Power** has requested the Commission to consider the full recovery of tariff for excess generation, as the generators have limited control over the generation. As the beneficiary is given the right to refuse, it makes it a sale under mutual consent and, hence, putting any restriction on tariff will be unjust and further there are penalties associated with under-generation by RE generator. If capping has been put on the price of electricity, which is lower than the PPA tariff, RE generator should be eligible to avail Renewable Energy Certificate (REC) for such sale.

10.9 **The Tata Power Company Ltd.** has suggested that instead of first right of refusal, the beneficiary should be mandated to purchase entire generation in excess of CUF. In case the beneficiary is not interested, there should be a provision wherein the beneficiary can authorize the generator to sell this excess power in the market. Further, the stakeholder proposed that the buyer of the excess power should be allowed to consider this quantum under green power for fulfilling the RPO obligation.

10.10 **Association of Power Producers (APP)** has requested to consider the tariff of excess energy purchase by concerned beneficiary at the same tariff applicable for that year, as the actual generation and project cost varies from site to site. This will allow the developer to recover full tariff on the generation in excess of CUF/PLF specified under these Regulations, which will improve the viability of the project.

10.11 **IWPA (NRC)** submitted that the generators should be given incentives for over-generation rather than penalizing them for the same, as in case of the projects other than competitive bidding, the power off-take is a huge uncertainty along with various risks such as payment delays, change in State/ Central Regulations, clearances to be taken by the project developer, along with building of transmission

infrastructure, etc.

10.12 **Bask Research Foundation** has requested that discount offered on the tariff for excess energy should be technology specific or reflective of the fixed cost and variable cost in the single part tariff.

10.13 **NTPC** submitted that the developers should be allowed to declare design CUF, which can be above minimum specified CUF, and the project developer should be allowed to revise its design CUF during first year of the operation. The stakeholder has also submitted that the developer should be allowed to have a band (range) of CUF between maximum and minimum CUF as solar irradiation may vary from year to year. The Guidelines of Central Government for Tariff Based Competitive Bidding for solar PV Projects also provides for “Range of Capacity Utilization Factor” (Clause 5.2.1). The changes proposed by NTPC are as follows:

“11. Treatment for Over-Generation

The renewable project developer shall declare its Design CUF at the inception i.e at the time of signing of power purchase agreement;

Provided that Design CUF of the renewable project shall not be less than the Minimum CUF specified under these regulations;

Also provided that the project developer shall be allowed to revise the Design CUF once during first year of its commercial operation.

The Renewable Project Developer may sell the excess energy i.e. Renewable Generation above the maximum CUF to any entity, provided that the first right of refusal for such excess energy shall vest with the concerned beneficiary. In case the concerned beneficiary purchases the excess energy, the tariff for such excess energy shall be 75 percent of the tariff applicable for that year.”

10.14 **KPTCL** submitted that the tariff for sale of excess energy should be considered as 50% of tariff, as the cost of projects and maintenance has already been included in tariff based on CUF.

10.15 **Radiance Renewables** has suggested to provide full recovery of tariff for excess generation as the beneficiary has been given the right to refuse for purchase of excess energy generated. Further, it has submitted that there are penalties associated with under-generation by RE generator. Hence, benefit of over-generation must be provided to the generator given the fact that the generators have limited control over the generation.

10.16 **Hyderabad MSW Energy Solutions Pvt. Limited** has requested to consider the same applicable tariff in case of attaining over generation in case of Waste-to-Energy plants.

Analysis and Decision

10.17 This issue was well deliberated in the Explanatory Memorandum issued with the Draft Regulations. Further, while determining the tariff, full cost recovery is allowed at normative CUF and hence, the benefit of excess generation needs to be shared between the generating company and the beneficiary(ies). Hence, the Commission has retained the provision of excess generation as proposed in the Draft Regulations.

Chapter 2: Financial Principles

11 Capital Cost

Commission's Proposal

11.1 The norms for Capital Cost were proposed as under as per Regulation 12 of the Draft Regulations:

"12. Capital Cost

Norms for capital cost, as specified in relevant chapters of these regulations, shall be inclusive of all capital work including plant and machinery, civil work, erection and commissioning, financing and interest during construction, and evacuation infrastructure up to inter-connection point."

Comments Received

11.2 **Radiance Renewables** has requested to consider the costs associated with land, which is a key element of the capital cost, and additional investments required towards procuring, installing and maintaining the necessary equipment towards compliance of Forecasting and Scheduling and Deviation Settlement Mechanism Regulations, in the definition of the Capital Cost.

Analysis and Decision

11.3 The Commission has modified the definition in the CERC RE Tariff Regulations, 2020.

12 Debt Equity Ratio

Commission's Proposal

12.1 The normative debt-equity ratio was proposed as under as per Regulation 13 of the Draft Regulations:

"13. Debt Equity Ratio

For determination of generic tariff and project specific tariff, the debt equity ratio shall be considered as 70:30:



Provided that, for project specific tariff, where the equity actually deployed is more than 30% of the capital cost, equity in excess of 30% shall be treated as normative loan;

Provided further that for project specific tariff where equity actually deployed is less than 30% of the capital cost, the actual equity shall be considered for determination of tariff;

Provided also that the equity invested in foreign currency shall be designated in Indian rupees on the date of each investment;

Provided also that debt equity ratio shall be considered after deducting the amount of grant or capital subsidy received for the project for arriving at the amount of debt and equity.

Explanation-The premium, if any, raised by the generating company, while issuing share capital and investment of internal resources created out of its free reserve, for the funding of the project, shall be reckoned as paid up capital for the purpose of computing return on equity, only if such premium amount and internal resources are actually utilised for meeting the capital expenditure of the renewable energy project.

(2) The project developer shall submit the resolution of the Board of the company or approval of the competent authority in other cases regarding infusion of funds from internal resources in support of the utilization made or proposed to be made to meet the capital expenditure of the renewable energy project."

Comments Received

12.2 HPPA and Bonafide Himachalies Hydro Power Developers Association have requested that tariff determination should be done without considering the Central Financial Assistance (CFA), and the reduction should be decided as per tariff template based on actual cash flow of the CFA/subsidy to the Developer, as the Ministry of New & Renewable Energy (MNRE) provides capital subsidy after the commissioning of the project and in instalments after verification of the actual performance of the plant and the quantum of CFA, number of instalments and time of release varies with each scheme. They have also submitted that the scheme expires due to excessive time taken for clearances or due to delay in construction of project due to some mishap or even due to geological surprises, and CFA is not released. Still the generic tariff is offered after considering CFA with the argument that developer is inefficient and inefficiency is not to be rewarded.

Analysis and Decision

12.3 If CFA/ subsidy is committed for certain projects, the tariff needs to be determined considering the same and for availing the same, the project developer has to take adequate steps to meet the conditions stipulated for release of

CFA/Subsidy.

12.4 Hence, the Commission has decided to retain the existing provisions as specified in the Draft Regulations.

13 Loan Tenure and Interest on Loan

Commission's Proposal

13.1 Loan tenure and interest on loan were proposed as under as per Regulation 14 of the Draft Regulations:

"14. Loan Tenure and Interest on Loan

(1) Loan Tenure

For determination of generic tariff and project specific tariff, loan tenure of 15 years shall be considered.

(2) Interest on Loan

- a) The loans arrived at in the manner indicated in Regulation 13 shall be considered as gross normative loan for calculation for interest on loan. For project specific tariff, the normative loan outstanding as on 1st of April of every year shall be worked out by deducting the cumulative repayment up to 31st March of previous year from the gross normative loan.*
- b) For the purpose of computation of tariff, normative interest rate of two hundred (200) basis points above the average State Bank of India Marginal Cost of Funds based Lending Rate (MCLR) (one-year tenor) prevalent during the last available six months shall be considered.*
- c) Notwithstanding any moratorium period availed by project developer, the repayment of loan shall be considered from the first year of commercial operation of the project and shall be equal to the annual depreciation allowed."*

Comments Received

13.2 **Venika Hydro Projects Pvt. Ltd** has requested to consider IREDA loan tenure for determination of tariff for small hydro projects.

13.3 **Greenko** and **NSEFI** requested to retain the loan tenure period as 13 years in line with previous RE Tariff Regulations, 2017. They further suggested that the Commission should consider normative interest rate of IREDA prevalent during the last available six months for small hydro projects, as major chunk of hydro stations are financed through IREDA wherein the rate of investment is between 11.45-14%.

13.4 **Venika Hydro Projects Pvt. Ltd** has requested to consider IREDA rate of Interest on loans for small hydro projects.

13.5 **Shree Bhavani Power Projects Pvt. Ltd** has requested to consider 12% rate of



interest on loan for SHP, which is in line with IREDA rate of interest. Further, it requested to consider the loan tenure of 11 to 12 years.

13.6 **GRIDCO** has requested for consideration of normative interest rate above the average State Bank of India (SBI) Marginal Cost of Funds based Lending Rate (MCLR) (one-year tenor) prevalent during the last available six months or at the weighted average rate of interest on actual loan portfolio of the generating station or in the absence of actual loan portfolio of the generating station, the weighted average rate of interest of the generating company as a whole, whichever is minimum.

13.7 **ACME** has requested the Commission to consider normative interest rate of four hundred (400) basis points above the average SBI MCLR (one-year tenor) prevalent during the last available six months. Further, it also submitted that presently, Power Finance Corporation (PFC) and Rural Electrification Corporation (REC) are top lenders for RE projects whose interest rates are much higher, and majority of RE projects are being funded by lenders other than SBI, the interest rate should not be linked to SBI rate.

13.8 **RUMSL** requested to consider loan tenure of 15 years for projects whose useful life is more than 20 years and loan tenure of 12 years for projects whose useful life is up to 20 years. Further, the stakeholder cited examples to show that loan tenure is not same for all technologies and life of the project of biomass/ bagasse is 20 years and, therefore, it is difficult for such projects to get loan for 15 years.

13.9 **The Tata Power Company Ltd. and Torrent Power Limited** have proposed to retain the loan tenure to 13 years instead of 15 years as every generator/ promoter/ project has a different risk profile and may not be able to get loan for long tenure. In absence of long tenure, they might face difficulty in making scheduled repayments.

13.10 **Bask Research Foundation** has requested to consider loan tenure of minimum 15 years for generic and project specific tariff.

13.11 **Radiance Renewables** has requested the Commission to retain the loan tenure as 13 years in line with previous RE Tariff Regulations, 2017 as not all RE developers have the scale of the project and necessary access to obtain loans from IREDA, PFC and REC. They may still have to resort to loans from private lenders, who do not provide loans for such long tenures.

Analysis and Decision

13.12 In the Explanatory Memorandum, it was stated that various financial institutions provide loan tenure ranging from 10-15 years. As many RE technologies have achieved maturity level, it is now possible for the developers to get loan from lenders/ financial institutions for longer duration, say, 15 years. Hence, the

Commission has decided to retain the loan tenure of 15 years as provided in Draft Regulations.

13.13 The Commission has linked interest rate with SBI's average MCLR (one-year tenor) prevalent during the last available six months. The Commission is of the view that this will be a true representation of market realities and has decided to continue with the provision made in the Draft Regulations. Spread of 200 basis points is expected to be an average, with projects obtaining loans at above and below this point.

13.14 Hence, the Commission has decided to retain the loan tenure and interest rate norms as specified in the Draft Regulations.

14 Depreciation

Commission's Proposal

14.1 The depreciation was proposed as under as per Regulation 15 of the Draft Regulations:

"15. Depreciation

(1) The value base for the purpose of depreciation shall be the capital cost of the project admitted by the Commission. The salvage value of the project shall be considered as 10% and depreciation shall be allowed up to maximum of 90% of the capital cost of the project:

Provided that, no depreciation shall be allowed to the extent of grant or capital subsidy received for the project.

(2) Depreciation rate of 4.67% per annum shall be considered for the first 15 years and remaining depreciation shall be evenly spread during remaining Useful Life of the project.

(3) Depreciation shall be computed from the first year of commercial operation:

Provided that, for determination of project specific tariff, in case of commercial operation of the project for part of the year, depreciation shall be computed on pro rata basis."

Comments Received

14.2 **Venika Hydro Projects Pvt. Ltd** has requested to consider depreciation rate of 5% per annum for 20 years for SHP.

14.3 **Shree Bhavani Power Projects Pvt. Ltd** has requested to retain depreciation rate at 5.28% per annum for SHP as per CERC RE Tariff Regulations, 2017.

14.4 **Enel Green Power India Pvt. Ltd.** has requested the Commission to re-

consider determination of salvage value and depreciation allowable for all projects. It submitted that for conventional projects, the Commission has considered a salvage value of 5% mainly because the useful life of thermal assets has correspondingly been increased to 35 years. Hence, it has submitted two options for renewable energy projects. For the projects where developers are willing to operate the project for more than 30 years and bear the obligation and responsibility to operate the project and the sign the PPA for a term of more than 25 years, for such projects, generic tariff/ project specific tariff may be determined assuming 5% as salvage value. For projects, where developers restrict them to 25 years, salvage value may be retained as 10%.

14.5 **Greenko, NSEFI, Torrent Power Limited and Radiance Renewables** have suggested that the Commission should retain the depreciation rate at 5.28% during the loan tenure of 13 years in line with previous order based on "Differential Depreciation Approach" and beyond the loan tenure, the remaining depreciation should be spread over the useful life computed on "Straight Line Method".

14.6 **ACME** has suggested to consider salvage value of the project as 5% and allow depreciation up to maximum of 95% of the capital cost of the project in line with the provisions of Companies Act, 2013. Depreciation rate of 5.28% per annum should be considered for the first 13 years and remaining depreciation should be evenly spread during remaining Useful Life of the project, considering the salvage value of the project as 5%.

14.7 Further, **ACME** has requested the Commission to add the following provision for allowing the forex variations and hedging cost, which will increase the availability of capital and also reduce the cost of finance:

“Recovery of cost of hedging or Foreign Exchange Rate Variation (FERV):

(1) The generating company may hedge foreign exchange exposure in respect of the interest and repayment of foreign currency loan taken for the generating station, in part or in full at its discretion.

(2) Every generating company shall recover the cost of hedging and foreign exchange rate variation on year-to-year basis as income or expense in the period in which it arises.”

Analysis and Decision

14.8 As loan tenure has been specified as 15 years, there is no justification to allow depreciation rate of 5.28% for first 13 years, as the depreciation is typically used to make the loan repayment. The Commission has adopted the ‘Differential Depreciation’ approach over the loan tenure and beyond loan tenure over useful life computed on ‘Straight Line Method’. The Commission has arrived at the depreciation rate of 4.67% per annum for first 15 years and remaining depreciation

to be spread during remaining useful life of the RE projects considering the salvage value of the project as 10% of project cost.

14.9 Foreign exchange rate variation and hedging depends on the source of debt considered by the project developer as these parameters will come under the scope of the project developer. Hence, there is no requirement to specify the same in these Regulations.

14.10 Hence, the Commission has decided to retain the depreciation rate norms as mentioned in the Draft Regulations.

15 Return on Equity

Commission's Proposal

15.1 The Return on Equity was proposed as under as per Regulation 16 of the Draft Regulations:

"16. Return on Equity

(1) The value base for equity shall be as determined under Regulation 13.

(2) The normative Return on Equity shall be 14%, to be grossed up by prevailing rate of Minimum Alternate Tax (MAT) as on 1st April of previous year for the entire Tariff Period."

Comments Received

15.2 **Venika Hydro Projects Pvt. Ltd** and **PTC India** have suggested to consider normative return on equity of 16% to be grossed up by prevailing rate of Minimum Alternate Tax (MAT) as it will attract more investments in renewable energy.

15.3 **Shree Bhavani Power Projects Pvt. Ltd** has requested to consider normative return on equity of 16% or 17% as SHP is far riskier and also to incentivize entrepreneurs to take risk.

15.4 **Shree Ganesh Edibles Pvt. Ltd.** has requested to consider normative return on equity of at least 15.5% at par with conventional sources and grossing up for first 10 years based on rate of MAT and for the balance period on full Income Tax rate.

15.5 **HPPA** and **Bonafide Himachalies Hydro Power Developers Association** have requested the Commission to consider ROE of at least 15.5% at par with conventional sources and grossing up for first 10 years based on MAT rate and for the balance period on full Income Tax rate for SHP. Further, they submitted that the benefit of grossing up for the period at full Income Tax rate is being denied to SHPs having PPA term of 35/40 years, who will suffer the most on this account as MAT benefit for carried forward losses will be over in around 10 years as GOI has lowered the Income Tax rates for newly incorporated companies and 10-year tax holiday and Section 80(I)(a) are presently not available to the companies.

15.6 **GRIDCO** has requested for consideration of normative Return on Equity of 200 basis points above the average SBI MCLR (one-year tenor) prevalent during the last available six months, to be grossed up with prevailing rate of MAT as on 1st April of previous year for the entire Tariff Period as RE projects are exposed to lower risk during the construction phase compared to conventional generation projects and there is no salvage value of assets for the subsidized portion, which is a gain to the developer apart from the decreasing trend of lending rates.

15.7 **Solar Energy Corporation of India (SECI)** has suggested that the normative Return on Equity of 14% should be grossed up by prevailing rate of Income Tax as on 1st April of previous year for the entire Tariff Period and for the companies who have opted for new tax structure, where MAT is not available, the applicable Income Tax may be used for grossing up.

15.8 **ACME** has requested to consider the normative Return on Equity of 16.5%, to be grossed up by the prevailing rate of Marginal rate of tax/Corporate Tax as on 31st March of previous financial year for the entire Tariff Period as the base rate of 16.50% for the storage type hydro generating stations including pumped storage hydro generating stations and run-of-river generating station with pondage has been considered in CERC (Terms and Conditions of Tariff) Regulations, 2019, and to encourage more investments into RE sector.

15.9 **IWPA** has suggested to consider normative return on equity of 16% considering the inherent risks involved in the renewable energy projects.

15.10 **APP** has requested to consider Return on Equity for RE projects either higher or at par with conventional sources with the Return on Equity of at least 15.5%, as the proposed Return on Equity of 14% would create negative sentiments in investors towards investment in renewable energy projects.

15.11 **NTPC** has requested to consider normative return on equity grossed up for first 5 years based on rate of MAT and for the balance period on Corporate Tax rates.

15.12 **CESC Limited and Haldia Energy Limited** have requested to consider Return on Equity for RE projects at the same level as specified in the Central Electricity Regulatory Commission (Terms and Conditions of Tariff) Regulations, 2019, if not higher.

15.13 **Ramky Enviro Engineers Limited** has requested to consider Return on Equity of 19% on post tax basis for WTE projects.

15.14 **Dr. Anoop Singh, IIT Kanpur** has submitted that a recent study at CER, IITK has been done using Capital Asset Pricing Model (CAPM) and multi-factor models using comprehensive data for over 155 infrastructure companies between 1998-2018

and as per this study, the Return on Equity for RE sector is in the range of 12.25-16.75%, on a post-tax basis. Further, for better clarity, he has suggested modification in the applicability of MAT Rate of 1st April preceding the commissioning of the project, as under:

“The normative Return on Equity shall be 14%, to be grossed up by prevailing rate of Minimum Alternate Tax (MAT), as on 1st April preceding the CoD, for the entire Tariff Period.”

Analysis and Decision

15.15 Some stakeholders have suggested the Return on Equity of 16% or 17%, while others have suggested to lower the Return on Equity by linking it to SBI MCLR. The Commission in the Draft Regulations proposed Return on Equity of 14% primarily based on cost of equity arrived through Capital Asset Pricing Model.

15.16 Some stakeholders have suggested to allow Return on Equity of 15.5% equivalent to conventional power projects. In this regard, it is important to note that the gestation period of Renewable Energy projects is typically less than 2 years as compared to gestation period of around 3-4 years for conventional projects. Hence, 14% Return on Equity for RE projects will more or less provide same equity IRR as that for conventional projects with 15.5% Return on Equity.

15.17 As regards grossing up of the rate of Return on Equity, the Commission is of the view that with tax benefits and MAT set off, generally a new project is entitled to pay MAT for initial 15-20 years and corporate tax rate is applicable thereafter. Hence, the Commission has decided to modify this provision by grossing up Return on Equity with MAT rate for first 20 years and Corporate Tax rate thereafter. Further, instead of grossing up with MAT rate or Corporate Tax rate applicable during previous year, the Commission is of the view that it would be more appropriate to gross up the Return on Equity with latest available notified MAT rate or Corporate Tax rate. Accordingly, suitable modifications have been made in the CERC RE Tariff Regulations, 2020.

16 Interest on Working Capital

Commission’s Proposal

16.1 The Interest on Working Capital was proposed as under as per Regulation 17 of the Draft Regulations:

“17. Interest on Working Capital

(1) The Working Capital requirement in respect of wind power projects, small hydro projects, solar PV power projects, floating solar projects, solar thermal power projects, and renewable energy with storage projects shall be computed in accordance with the following:



- a) *Operation and Maintenance expenses for one month;*
 - b) *Receivables equivalent to 45 days of tariff for sale of electricity calculated on normative Capacity Utilisation Factor or Plant Load Factor, as the case may be; and*
 - c) *Maintenance spares equivalent to 15% of Operation and Maintenance expenses.*
- (2) *The Working Capital requirement in respect of biomass power projects with Rankine cycle technology, biogas power projects, biomass gasifier based power projects, non-fossil fuel based co-generation projects, municipal solid waste based power projects and refuse derived fuel based power projects shall be computed in accordance with the following:*
- a) *Fuel costs for four months equivalent to normative Plant Load Factor;*
 - b) *Operation and Maintenance expense for one month;*
 - c) *Receivables equivalent to 45 days of tariff for sale of electricity calculated on the plant load factor; and*
 - d) *Maintenance spares equivalent to 15% of Operation and Maintenance expenses.*
- (3) *In case of renewable hybrid energy projects, the Working Capital requirement shall be sum of the Working Capital requirement determined as per norms applicable for renewable energy sources, in proportion to their rated capacity in the project.*
- (4) *Interest on Working Capital shall be at interest rate equivalent to the normative interest rate of three hundred and fifty (350) basis points above the average State Bank of India Marginal Cost of Funds based Lending Rate (MCLR) (one-year tenor) prevalent during the last available six months."*

Comments Received

16.2 **Venika Hydro Projects Pvt. Ltd** has requested to consider IREDA rate of Interest on Working Capital plus 350 basis point for small hydro projects.

16.3 **Rudraksh Energy** has suggested to retain the provision of receivable period of 60 days for biomass based plants with Rankine cycle technology as per CERC RE Regulations, 2017 as Discoms normally do not pay the power bills even in 60 days.

16.4 **GRIDCO** has requested the Commission to consider interest rate equivalent to the normative interest rate of two hundred (200) basis points above the average SBI MCLR (one-year tenor) prevalent during the last available six months due to the decreasing trend of lending rates.

16.5 **ACME** has requested the Commission to consider normative interest rate of six hundred (600) basis points above the average SBI MCLR (one-year tenor) prevalent during the last available six months and Receivables equivalent to 90 days of tariff for sale of electricity calculated on normative Capacity Utilisation Factor or

Plant Load Factor.

16.6 **ReNew Power** has requested to consider receivables equivalent to 180 days of tariff for sale of electricity, as majority of Discoms are taking a period of at least six months in releasing the payments.

16.7 **RUMSL and Torrent Power Limited** have requested to consider receivables period of 60 days of tariff for sale of electricity. As per the data available on PRAAPTI portal, majority of the States are having very poor payment cycle and have overdues greater than 100 days and there are outstanding dues of Rs. 68.37 billion to be paid to renewable generators.

16.8 **IWTMA and APP** have requested that the receivables equivalent to 60 days to 90 days should be taken into consideration for all RE power generators as State Discoms take at least 3 to 5 months for payments of bills.

16.9 **IWPA** has requested to consider the receivable period for estimating the interest on working capital requirements as 30 days over and above the normal credit period allowed to Distribution Licensee for making payment on submission of invoices as in some States, the Joint Meter Reading (JMR) itself is released after 20 days of JMR date and then the invoice is prepared and sent to the Distribution Licensee's office.

16.10 **Bask Research Foundation** has requested to consider SBI MCLR during the last six months plus 300 basis points as the rate of Interest on Working Capital to ensure efficient debt financing. In addition, it has requested that maintenance spares based on percentage of Operation & Maintenance (O&M) expenses should be reflective of industry benchmarks for respective technology.

16.11 **PTC India** has requested to consider the receivable period as 90 days as in the ongoing scenario, wind and solar energy projects are facing high receivable period. Further, it has requested to change the maintenance spares for wind projects to 30% of O&M expenses as wind projects contain more mechanical moving parts and high cost is involved for the maintenance of the same.

16.12 **Dr. Anoop Singh, IIT Kanpur** has sought clarification regarding the consideration of both O&M expenses for one month and 15% of O&M expenses as a part of Maintenance Spares separately while computing the Working Capital requirement.

Analysis and Decision

16.13 The Commission has linked interest rate with SBI's average MCLR (one-year tenor), prevalent during the last available six months. The Commission is of the view that this will be a true representation of market realities and has decided to continue

with the provision in the Draft Regulations. Spread of 350 basis points is expected to be an average, with projects sourcing funds at above and below this point. This amounts to an interest rate of 11.17%, considering the MCLR data during December 2019 – May 2020.

16.14 The prescribed receivables and other norms of working capital are in line with CERC (Terms and Conditions for Tariff) Regulations, 2019 and hence, the Commission has decided to retain the norms as specified in the Draft Regulations.

16.15 As regards the consideration of maintenance spares in working capital, there is no double accounting as the generating company is required to keep some maintenance spares for which separate working capital is required apart from normal working capital required to meet the O&M expenses.

16.16 As regards the technology-wise maintenance spares as a percentage of O&M Expenses, the Commission is of the view that any change in this regard can be considered only after detailed study. As such, the maintenance spares shall be 15% of O&M expenses for the Control Period 2020-23.

16.17 Hence, the Commission has decided to retain the norms for Interest on Working Capital as provided in Draft Regulations.

17 Operation and Maintenance Expenses

Commission's Proposal

17.1 The O&M expenses were proposed as under as per Regulation 19 of the Draft Regulations:

"19. Operation and Maintenance Expenses

(1) Operation and Maintenance expenses shall be determined for the Tariff Period of the project based on normative O&M expenses specified in these regulations for the first year of the Control Period.

(2) Normative O&M expenses allowed during first year of the Control Period i.e. financial year 2020-21 under these regulations shall be escalated at the rate of 3.84% per annum for the Tariff Period."

Comments Received

17.2 **Greenko** and **NSEFI** have requested to retain the existing escalation rate of 5.72% as most of the renewable energy projects are smaller in size and highly labour intensive and to retain the skilled labour at remote project sites, they have to be provided with good remuneration and in current scenario, O&M cost has increased due to increase in wages and spares cost.

17.3 **ACME** has requested to consider escalation at the rate of 10% per annum for

the Tariff Period as minimum salary increments are at least 10% and solar O&M expenses also attracts 18% GST. Further, it has requested to include the following provision:

“O&M expenses shall be computed annually in Rs. Lakh/MW with annual escalation of 10% per annum”

17.4 **IWPA and PTC India** have requested the Commission to consider 5% escalation rate in O&M costs every year as per the industry practice.

17.5 **NTPC** submitted that considering wide fluctuation of 33% in the escalation rates between two Control Periods and since RE tariff is determined on levelized basis for the entire useful life of 25 years, the proposed escalation rate of 3.84% is very low. Also, unlike projects where tariff is determined under Section 63 of the Act, projects under Section 62 have no margin to absorb significant O&M expenses. Hence, the Commission should allow normative O&M expenses based on escalation factors as determined by the Commission in the various Tariff Periods under RE Tariff Regulations during the useful life of the project, instead of fixing them for the life of the project. Alternatively, the Commission may revise escalation factor considering trend over a longer duration of time. Considering CPI and WPI indices over a period of last 8 years, i.e., from 2012 to 2019, the escalation rate works out to 5%.

17.6 **Radianc Renewables** has requested to retain the existing norms considering the COVID pandemic situation.

Analysis and Decision

17.7 The Explanatory Memorandum has given detailed explanation of the computation of escalation factor. Based on the average of CPI and WPI indices for last five years, i.e., 2014-15 to 2018-19, and by considering the weightage of CPI and WPI in the ratio of 70:30, the escalation factor works out to 3.84%. The escalation rate specified in the Draft Regulations are in line with the market trends and has been retained for the Control Period 2020-23. Having a constant escalation factor for the plant being commissioned under a Control Period has been a norm. The Commission is of the view that the provision of O&M cost escalation is adequate and needs no alteration vis-à-vis the Draft Regulations.

17.8 Hence, the Commission has decided to retain the norms for O&M expenses as provided in the Draft Regulations.

18 Rebate

Commission’s Proposal

18.1 The rebate was proposed as under as per Regulation 20 of the Draft

Regulations:

“20. Rebate

(1) *For payment of bills of the generating company through revolving and valid letter of credit on presentation or through National Electronic Fund Transfer (NEFT) or Real Time Gross Settlement (RTGS) payment mode within a period of 5 days of presentation of bills, a rebate of 1.5% on bill amount shall be allowed.*

Explanation: In case of computation of ‘5 days’, the number of days shall be counted consecutively without considering any holiday. However, in case the last day or 5th day is official holiday, the 5th day for the purpose of rebate shall be construed as the immediate succeeding working day.

(2) *Where payments are made on any day after 5 days within a period of one month from date of presentation of bills by the generating company, a rebate of 1% shall be allowed.”*

Comments Received

18.2 **Enel Green Power India Pvt. Ltd.** has requested to consider the rebate of 1.2% and further requested that no relaxation in terms of rebate should be allowed for making payments beyond 5 days from the date of presentation of bill.

18.3 **GRIDCO** has requested to consider the rebate of 2% for payment within a period of 5 days of presentation of bills to the Beneficiary(ies) in complete shape, and for payments that are made on any day after 5 days within a period of one month from date of presentation of bills in complete shape by the generating company, a graded/pro-rated rebate up to 2% should be allowed.

18.4 **RUMSL** requested to consider change in the usage of the term “one month” to “30 days” to avoid any ambiguity in the second point under Rebate.

18.5 **APP** has requested to include provision of pro-rata reduction of rebate after 5th day of bill date. This is required to differentiate between the early and delayed payments by beneficiaries after 5th day of bill date, thereby providing applicable rebate adjusted in similar ratio based on day of payment. Further, the stakeholder commented that if such provisions are not made, then beneficiaries would have no incentive for making early payment once the deadline of 5th day is over and they would prefer to make payment only on 30th day by availing 1% rebate.

18.6 **Gujarat Biomass Energy Development Association** has submitted that proposing rebate for payment done through any medium other than Letter of Credit will provide an undue financial favour to the utilities. Hence, it requested to allow rebate of 1.5 % and 1% only when the payment is made through revolving and valid

Letter of Credit within 5 days and within period of one month, respectively, from the date of presentation of bills.

18.7 **PTC India** has requested to include provisions of Escrow Account and Letter of Credit to assure payment security in line with the Ministry of Power (MoP) Guidelines, as this will increase the confidence among the generators.

18.8 **Radiance Renewables** has requested to include the provision of mandatory Letter of Credit duly approved by the Discom for the payment, in line with the norms specified for conventional power projects.

18.9 **Dr. Anoop Singh, IIT Kanpur** has suggested to consider rebate on early payment linked to SBI MCLR due to the dynamics in the financial markets. Further, the stakeholder suggested to add provision for 'advance' payment.

Analysis and Decision

18.10 The Commission is of the view that the provision of rebate is adequate and is also in line with the rebate considered for conventional power projects as per CERC (Terms and Conditions for Tariff) Regulations, 2019. Further, the buyers and sellers are free to negotiate mutually acceptable terms.

18.11 Hence, the Commission has decided to retain the norms for rebate as provided in Draft Regulations.

19 Late Payment Surcharge

Commission's Proposal

19.1 The Late Payment Surcharge was proposed as under as per Regulation 21 of the Draft Regulations:

"21. Late payment surcharge

In case the payment of any bill for charges payable under these regulations is delayed beyond a period of 45 days from the date of presentation of bills, a late payment surcharge at the rate of 1.50% per month shall be levied by the generating company."

Comments Received

19.2 **Venika Hydro Projects Pvt. Ltd.** has requested to consider applicability of late payment surcharge of 1.50% per month to be levied by the generating company for payments delayed beyond a period of 30 days from the date of presentation of bill.

19.3 **GRIDCO and PCKL** have requested to retain late payment surcharge at the rate of 1.25% per month as per RE Tariff Regulations, 2017.

19.4 **Greenko and NSEFI** have suggested that the Commission should make the late payment surcharge rates incremental to ensure timely payments as it confines

the beneficiary to make payment on timely basis. They have suggested the following provisions:

- a) Delay of payment beyond 45 days, upto 60 days- LPS of 1.50%
- b) Delay of payment beyond 60 days, upto 75 days- LPS of 1.75%
- c) Delay of payment beyond 75 days, upto 90 days- LPS of 2%
- d) Delay of payment beyond 90 days- LPS of 2.5%

19.5 **IWTMA** has requested to increase late payment surcharge to 1.5% for delay in payment for 45 to 90 days, 2% for delay in payment for 90 to 120 days and 3% for above 120 days, as in the present scenario many Discoms have not paid the bills for more than 5 months and late payment surcharge for them is also 1.5%, which is not correct. Also, penalty norms have to be strict so that the Discoms start making the pending payments on time, which is essential for day to day operations of the generators.

19.6 **APP** has requested to consider applicability of late payment surcharge from the due date of 30 days of submission of bill and further requested that the developer should not be burdened for additional period, beyond due date of 30 days.

19.7 **KPTCL** has requested to retain the provisions of existing CERC RE Tariff Regulations, 2017 to provide additional breathing time to distribution licensees.

Analysis and Decision

19.8 The Commission is of the view that the provision of late payment surcharge is adequate and is also in line with the late payment surcharge norms considered for conventional power projects as per CERC (Terms and Conditions for Tariff) Regulations, 2019.

19.9 Hence, the Commission has decided to retain the norms for Late Payment Surcharge as provided in the Draft Regulations.

20 Subsidy or incentive by the Central or the State Government

Commission's Proposal

20.1 The treatment of subsidy or incentive was proposed as under as per Regulation 22 of the Draft Regulations:

"22. Subsidy or incentive by the Central or the State Government

- (1) *The Commission shall take into consideration any incentive, grant or subsidy from the Central or State Government, including accelerated depreciation benefit, availed by the project, while determining the tariff under these regulations:*

Provided that the following principles shall be considered for ascertaining income tax benefit on account of accelerated depreciation, if availed, for the purpose of tariff determination:

- i) Assessment of benefit shall be based on normative capital cost, accelerated depreciation rate and corporate income tax rate as per relevant provisions of Income Tax Act, 1961 as amended from time to time; and*
 - ii) Capitalization of renewable energy projects during second half of the fiscal year.*
 - iii) Per unit benefit shall be derived on levelized basis at discount factor equivalent to weighted average cost of capital.*
- (2) Any grant, subsidy or incentives availed by renewable energy project, which is not considered at time of determination of tariff, shall be deducted by the beneficiary in subsequent bills after receipt of such grant, subsidy or incentive in suitable instalments or within such period as may be stipulated by the Commission.*
- (3) In case the Central or State Government or their agencies provide any generation-based incentive, which is specifically over and above the tariff, such incentive shall neither be taken into account while determining the tariff nor be deducted by the beneficiary in subsequent bills raised by the particular Renewable energy project."*

Comments Received

20.2 **Shree Bhavani Power Projects Pvt. Ltd.** has requested to prescribe only one tariff for small hydro projects and also spell out that the discussion on accelerated depreciation is limited to wind and solar projects and not applicable to small hydro projects. Further, as per Income Tax notification (Finance Act, 2015 w.e.f. 01/04/2016 with due insertion of sub-clause (xviii) in section 2(24) of the Income Tax Act, 1961 providing an inclusive definition of the expression 'Income' under the taxing law), a subsidy is now taxed as income. If SERCs deduct the subsidy from tariff (which really defeats the purpose of a subsidy), they must do so on a post-tax basis.

20.3 **Shree Ganesh Edibles Pvt. Ltd., HPPA and Bonafide Himachalies Hydro Power Developers Association** have submitted that the provision hypothetically reduces the completed capital cost and thereby equity also, which is not financially correct, as this will reduce the IRR and increase the payback period. Further, if the proposed Regulations are to be followed, then MNRE has to be directed to give CFA on Financial Closure of the project so that investment of the developer in the project reduces and the developer is able to bear the reduction in tariff appropriately, as it is evident that the proposed Regulations will reduce the equity of developer after the project is commissioned. Further, the stakeholders cited the example of Punjab SERC (PSERC), which determines the tariff without considering CFA.

20.4 **ReNew Power and Radiance Renewables** have requested to consider reversing the changes made in these Regulations and allow full benefits of grants/ subsidies to be availed by the RE developer as deducting the grants/ subsidies from

the capital amount for tariff determination goes against the purpose of such incentives being given.

20.5 IWPA has requested to not consider the incentives/ subsidies, which are specifically extended over and above the tariff determined/ applicable to wind developers for tariff determination, or if recovered/ deducted from developer in case such incentive/ subsidy is extended after the determination of tariff as incentives are provided with a view to encourage investments.

Analysis and Decision

20.6 It has been requested to provide only one tariff schedule for small hydro projects without incorporating the accelerated depreciation (AD) benefit as such projects are not availing AD benefit. As per Regulations, the generic tariff schedule for small hydro projects do not include AD benefit and tariff without AD benefit will be applicable for such projects during the Control Period.

20.7 If CFA/ subsidy is committed for certain project, the tariff needs to be determined considering the same and for availing the same, the project developer has to take adequate steps to meet the conditions stipulated for release of CFA/ subsidy.

20.8 Hence, the Commission has decided to retain the norms as specified in the Draft Regulations.

21 Statutory Charges

Commission's Proposal

21.1 The treatment of Statutory Charges was proposed as under as per Regulation 23 of the Draft Regulations:

"23. Statutory Charges

The renewable energy project developer shall recover from the beneficiaries, the statutory charges imposed by the State and Central Government such as water cess, electricity duty on auxiliary consumption."

Comments Received

21.2 GRIDCO has requested to consider the statutory charges on actual basis, subject to ceiling limit of any normative auxiliary consumption, as charges beyond normative consumption due to inefficiency of the generator should not be passed on to the beneficiary(ies) and ultimately to the consumers.

21.3 ACME has requested to consider taxes, duties, cess, levies, including but not limited to entry tax, BOCW, village development tax, etc., as part of statutory charges.



21.4 PCKL and KPTCL have requested to remove the provision of statutory charges as it will result in passing on the impact of the same to the consumers.

Analysis and Decision

21.5 This provision is not applicable to duties, taxes and other levies charged by the Government, which form part of the capital cost of the project, as normative capital cost specified by the Commission is inclusive of the same.

21.6 As regards providing ceiling limit to the auxiliary consumption, the Commission has decided to modify the provisions by allowing recovery of electricity duty on auxiliary consumption subject to maximum of normative auxiliary consumption. Regulation 23 has been revised accordingly.

Chapter 3: Parameters for wind power projects

22 Capital Cost

Commission's Proposal

22.1 The capital cost for wind power projects was proposed as under as per Regulation 24 of the Draft Regulations:

"24. Capital Cost

The Commission shall determine only project specific capital cost considering the prevailing market trends."

Comments Received

22.2 IWPA has requested to determine the capital cost for on-shore wind power projects of less than 25 MW as they are not allowed to participate in the competitive bidding process. Further, it commented that non-determination of tariff for such small wind power generators will be discrimination vis-à-vis bigger players.

Analysis and Decision

22.3 Wind is a mature technology and large number of projects are coming under the framework of competitive bidding. There is, however, a provision for project specific tariff for wind projects along with the financial and operational norms.

23 Capacity Utilisation Factor

Commission's Proposal

23.1 The CUF for wind power projects was proposed as under as per Regulation 25 of the Draft Regulations:

“25. Capacity Utilisation Factor

(1) Capacity utilization factor norms for this Control Period shall as follows:

Annual Mean Wind Power Density (W/m²)	Capacity Utilization Factor (%)
Upto 220	22%
221-275	24%
276-330	28%
331-440	33%
> 440	35%

- (2) The annual mean wind power density specified in sub-regulation (1) above shall be measured at 100 meter hub-height.
- (3) Wind power projects shall be classified into particular wind zone site as per MNRE guidelines for wind measurement. Based on validation of wind mast by National Institute of Wind Energy, State Nodal Agency should certify zoning of the proposed wind farm complex.”

Comments Received

23.2 IWPA has requested to standardise CUF of wind power projects to only three zones, as annual mean wind power density is impacted by several global factors. Further, it has suggested that retaining five different CUF zones would not be realistic and proposed the following three zones of CUF: -

Annual Mean Wind Power Density (W/m²)	Capacity Utilization Factor
Upto 275	22%
276-440	28%
> 440	33%

Analysis and Decision

23.3 It has already been explained in the Explanatory Memorandum that based on analysis of data, it is observed that CUFs proposed are adequate. Hence, the Commission decides to retain the existing provisions of CUF as per the Draft Regulations.

24 Auxiliary Consumption

Commission’s Proposal

24.1 Not Defined in the Draft Regulations.

Comments Received

24.2 PCKL has requested to include provision of auxiliary consumption as the wind farms have wind generators connected to 33/11 kV lines in a vast area that

requires illumination as well as energisation of 33/11 kV lines and transformers and other auxiliary power requirement. It has cited the example of Karnataka ERC (KEREC), which considers an auxiliary consumption of 0.5%.

24.3 KPTCL has requested to include provision of auxiliary consumption and consider lighting, step-up transformer consumption and other auxiliary power requirement in wind farms as auxiliary consumption. Further, it has proposed to consider normative auxiliary consumption of 0.5%.

Analysis and Decision

24.4 The Commission is of the view that there is no need to include the provision of auxiliary consumption for the wind power projects.

25 Operation and Maintenance expenses

Commission's Proposal

25.1 O&M expenses for wind projects was proposed as under as per Regulation 26 of the Draft Regulations:

"26. Operation & Maintenance Expenses

The Commission shall determine only project specific O&M expenses considering the prevailing market trends."

Comments Received

25.2 IWPA has requested to determine the O&M expenses for on-shore wind power projects of less than 25 MW as they are not allowed to participate in the competitive bidding.

25.3 Bask Research Foundation requested to specify benchmark values for O&M expenses with a provision of annual review based on market trends.

Analysis and Decision

25.4 As most of the wind power projects are coming under competitive bidding route, the Commission retains the provision to determine only project specific O&M Expenses for wind power projects for this Control Period.

Chapter 4: Parameters for small hydro projects

26 Capital Cost

Commission's Proposal

26.1 The Capital Cost for Small Hydro Projects was proposed as under as per Regulation 27 of the Draft Regulations:

"27. Capital Cost



(1) *The normative capital cost for small hydro projects during first year of Control Period*

Region	Project Size	Capital Cost (Rs. lakh/MW)
Himachal Pradesh, Uttarakhand, West Bengal and North Eastern States	Below 5 MW	1000
	5 MW to 25 MW	900
Other States	Below 5 MW	779
	5 MW to 25 MW	707

i.e. financial year 2020-21 shall be as follows:

(2) *The capital cost for small hydro projects as specified for first year of the Control Period shall remain valid for the entire duration of the Control Period unless reviewed earlier by the Commission"*

Comments Received

26.2 **Venika Hydro Projects Pvt. Ltd.** has submitted that the Commission has considered the same capital cost since last four years, which has been very difficult to achieve and requested to increase capital cost for 5MW-25MW SHP to Rs.900 lakh/MW for other States and to also consider IREDA opinion.

26.3 **Shree Bhavani Power Projects Pvt. Ltd.** has requested to review capital cost of SHP projects and accept the data of financial institutions like IREDA and PFC in order to bring the capital cost in line with market, as civil cost has increased substantially. In addition, they commented that rationalisation of GST in capital cost never happened and presently they pay around 13.2% GST on civil cost which works out to additional burden of 1 crore/MW (considering Rs.11 crore/MW project cost of which around 70% is civil cost. Therefore, Rs. 7.7 crore/MW * 13.2% = Rs 1.01 crore). Hence, they requested to consider minimum Rs. 11 crore/MW capital cost for SHP in hilly States.

26.4 **HPPA** has requested to consider realistic capital cost benchmark cost for determination of tariff for SHP in hilly areas as actual project cost in hilly areas is in the range of Rs. 11 to 16 crore/MW, which is supported by IREDA cost data. Further, it has submitted that in many States (Uttarakhand, Himachal Pradesh, Arunachal Pradesh, etc.), SHP up to 25 MW are subjected to same State policies as those applicable for conventional hydro power plant of size >25 MW and various fees and charges and taxes, etc., are not waived off/ subsidized for small hydro and they have to bear high fees and charges, which results in few hard and soft cost, which are borne by the developers. Therefore, it has requested to consider the hard and soft costs and statutory expenses to compute realistic capital cost benchmark for determination of tariff of small hydro projects in hilly areas.

26.5 **IREDA** has submitted the capital cost data of SHP projects that have been commissioned recently or are on the verge of commissioning in hilly region and other States and requested to consider the average capital cost for SHP as below: -

<i>Region</i>	<i>Project Size</i>	<i>Avg. Capital Cost (Rs. Crore/MW)</i>
<i>Himachal Pradesh, Uttarakhand, West Bengal and North Eastern States</i>	<i>Below 5 MW</i>	<i>12.57</i>
	<i>5 MW to 25 MW</i>	<i>13.14</i>
<i>Other States</i>	<i>Below 5 MW</i>	<i>8.90</i>
	<i>5 MW to 25 MW</i>	<i>10.89</i>

26.6 **Greenko** and **NSEFI** have suggested that the Commission should revise the capital cost for small hydro projects in Himachal Pradesh to Rs. 1100-1500 lakh/MW as per IREDA.

26.7 **Greenko** also submitted IREDA data and requested to consider the parameters related to project cost components as recommended by IREDA for determining the tariff for small hydro projects in hilly areas and other States.

26.8 **Bask Research Foundation** has submitted that as the State of West Bengal does not face similar logistics, supply chain and law and order challenges as North Eastern States, the inclusion of entire State of West Bengal in the category of high capital cost in terms of lakh/MW at par with other hilly States should be reconsidered.

26.9 **Bonafide Himachalies Hydro Power Developers Association** has requested to consider the completed cost of sample project in recent times as a guiding factor for determination of the capital cost of the project for the first year of Control Period, i.e., 2020-21. Otherwise appropriate increase in frozen capital cost of the Control Period 2017-18 should be allowed for the first year of new Control Period as in last three years, inflation and cost of manpower, steel, sand, gravel, cement, electrical equipment and other components have increased. In addition, the imposition of 18% GST on civil construction components have also impacted the capital cost. Further, it suggested for adoption of indexation methodology for remaining years of the Control Period.

Analysis and Decision

26.10 It has been pointed out that actual capital cost for SHP projects is considerably higher than the capital cost proposed in the Draft Regulations and that other factors such as impact of GST also need to be taken into consideration.

26.11 It needs to be appreciated that the Commission has to incentivise efficiency by providing a signal through capital cost norms and cannot go strictly by actual costs every time. However, it is also acknowledged that SHP have large local development component by providing local employment and power to local communities, which must be encouraged and supported.

26.12 The Commission observes that there is substantial variation in the capital cost of projects submitted by IREDA, as in some of the projects the capital cost is higher due to higher IDC and pre-operative expenses. It is also observed that the capital cost of small hydro projects of 5 MW to 25 MW have higher capital cost than small hydro projects of < 5 MW. Further, it has been observed that IREDA project data contains several projects in Jammu and Kashmir region. Hence, the Commission has decided to include the Union Territory of Jammu and Kashmir and Union Territory of Ladakh in the hilly terrain category.

26.13 After considering requests of the stakeholder and also considering the impact of the GST in capital costs, the Commission has decided to modify the capital cost for SHP by normalizing the average capital cost data submitted by IREDA by 15%.

26.14 Thus, based on the above review, the capital costs for small hydro projects have been modified for the Control Period 2020-23.

27 Capacity Utilisation Factor

Commission's Proposal

27.1 CUF for SHP was proposed as under as per Regulation 28 of the Draft Regulations:

"28. Capacity Utilization Factor

Normative capacity utilization factor for the small hydro projects located in Himachal Pradesh, Uttarakhand, West Bengal and North-Eastern States shall be 45% and for other States, it shall be 30%:

Explanation: For the purpose of this Regulation, normative capacity utilization factor is net of free power to the home State, if any."

Comments Received

27.2 **GRIDCO** has requested to include Odisha in the category of States in the upper slab for CUF as actual CUF for small hydro projects located in Odisha are more than 50%. Further, it has suggested that keeping in view the increasing cost of land and decreasing availability of land, which is further burdened with Resettlement & Rehabilitation (R&R) issues and forest and environment clearance, lower limit of CUF for small hydro projects located in other States should be at least

40%.

27.3 **Greenko** and **NSEFI** have requested to allow normative CUF for small hydro projects located in Himachal Pradesh, Uttarakhand, West Bengal and North-Eastern States at 45% ($\pm 5\%$ range) and for other States, at 30%. Hence, they have requested to specify normative CUF within the range of $\pm 5\%$ for meeting project specific criteria.

27.4 **Bask Research Foundation** submitted that provisions must be made to design tariff of small hydro projects to reflect ancillary and generation services as hydro has higher potential to provide ancillary services.

Analysis and Decision

27.5 As regards inclusion of Odisha in Special Category States, the Commission is of the view that this can be considered only after detailed study.

27.6 The range of CUF cannot be provided as it is ceiling norm. Further, defining CUF norms in the Regulations is necessary for prudent selection of sites and efficient operation of small hydro projects. It might not be prudent to install plants at sites which do not provide a CUF of even 30%. The Commission has modified the existing provision in the Draft Regulations by including Union Territories of Jammu and Kashmir and Ladakh to the special category of hilly region.

28 Operation and Maintenance expenses

Commission's Proposal

28.1 O&M expenses for SHP was proposed as under as per Regulation 30 of the Draft Regulations:

"30. Operation and Maintenance expenses

(1) Normative O&M Expenses for the first year of the Control Period i.e. financial year

<i>Region</i>	<i>Project Size</i>	<i>O&M Expenses (Rs. lakh/MW)</i>
<i>Himachal Pradesh, Uttarakhand, West Bengal and North Eastern States</i>	<i>Below 5 MW</i>	<i>41.78</i>
	<i>5 MW to 25 MW</i>	<i>31.34</i>
<i>Other States</i>	<i>Below 5 MW</i>	<i>33.66</i>
	<i>5 MW to 25 MW</i>	<i>24.37</i>

2020-21) shall be as under:

(2) Normative O&M Expenses allowed at the commencement of the Control Period i.e. financial year 2020-21 under these regulations shall be escalated at the rate specified in Regulation 19 of these Regulations for Tariff Period."

Comments Received

28.2 **Venika Hydro Projects Pvt. Ltd.** has requested to increase O&M expenses for 5MW-25MW SHP to Rs.35 lakh/MW.

28.3 **GRIDCO** has requested to consider norms for O&M expenses in case of small hydro plants based on actual data for last 3 years, as there has been a rise of 16.06% in normative O&M Expenses over last 3 years.

28.4 **Greenko** and **NSEFI** have requested to consider the O&M Expenses for small hydro projects in Himachal Pradesh at around Rs. 37 lakh/MW as per IREDA. Further, due to the ongoing COVID-19 pandemic, there will be huge impact on the logistics and manpower costs.

Analysis and Decision

28.5 The Commission is of the view that the norms specified in the Draft Regulations are in line with the market trends and have been retained for the first year (FY 2020-21).

28.6 The Commission has modified the existing provision in the Draft Regulations by including Union Territory of Jammu and Kashmir and Union Territory of Ladakh to the special category.

Chapter 5: Parameters for biomass based power projects based on Rankine Cycle technology

29 Plant Load Factor

Commission's Proposal

29.1 PLF for biomass-based power projects was proposed as under as per Regulation 32 of the Draft Regulations:

"32. Plant Load Factor

For the purpose of determination of tariff, the Plant Load Factor shall be considered as 80%."

Comments Received

29.2 **RUMSL** requested to separately specify PLF for stabilisation period (6 months) and PLF after stabilisation period for determination of the tariff, citing the examples of SERCs.

29.3 **APP** has suggested to consider PLF of 65% for first year during stabilisation period as biomass-based plants generally take one-year period for stabilisation.

Analysis and Decision

29.4 The Commission does not find any material reason for changing the norms as provided in the Draft Regulations, and decides to retain uniform PLF of 80% PLF for all years without providing any relaxation during the stabilisation period.

30 Use of Fossil Fuel

Commission's Proposal

30.1 The use of fossil fuel by biomass-based power projects was proposed as under as per Regulation 36 of the Draft Regulations:

" 36. Use of fossil fuel

The use of fossil fuels shall not be allowed:

Provided that for biomass power projects based on Rankine cycle technology commissioned on or before 31.03.2017, use of fossil fuels to the extent of 15% in terms of gross calorific value on annual basis, shall be allowed for the Useful Life of the project from the date of commercial operation."

Comments Received

30.2 **Bask Research Foundation** has requested to include the provisions of fuel monitoring mechanism in the Regulations.

Analysis and Decision

30.3 The Commission has decided that use of fossil fuels should not be allowed for new biomass power plants commissioned during the Control Period. Hence, there is no requirement to provide any provision separately for monitoring mechanism of fossil fuel as it is evident that the biomass plants commissioned on or before 31.03.2017 will be guided by the applicable Regulations for that Control Period.

31 Fuel Cost

Commission's Proposal

31.1 The Fuel Cost for biomass-based power projects was proposed as under as per Regulation 38 of the Draft Regulations:

"38. Fuel Cost

Biomass fuel price during first year of the Control Period i.e. financial year 2020-21 shall be as specified in the table below and shall be escalated at the rate of 5% per annum to arrive at the base price for subsequent years of the Control Period, unless reviewed earlier by Commission. For the purpose of determining levelized tariff, a normative escalation factor of 5% per annum shall be applicable on biomass fuel price.

<i>State</i>	<i>Biomass Prices for FY 2020-21 (Rs. /MT)</i>
--------------	--



<i>State</i>	<i>Biomass Prices for FY 2020-21 (Rs./MT)</i>
<i>Andhra Pradesh</i>	3326
<i>Haryana</i>	3786
<i>Maharashtra</i>	3872
<i>Punjab</i>	3960
<i>Rajasthan</i>	3305
<i>Tamil Nadu</i>	3272
<i>Telangana</i>	3326
<i>Uttar Pradesh</i>	3384
<i>Other States</i>	3557

Comments Received

31.2 **Biomass Energy Developers Association** has requested to consider the fuel price for Telangana as average biomass fuel price of its neighbouring States, viz., Andhra Pradesh and Maharashtra, which works out to Rs. 3617/MT for FY 2020-21.

31.3 **CSPDCL** has requested to consider the average biomass fuel price of Rs. 2762.52/MT and separately mention the biomass fuel price for the State of Chhattisgarh. Further, it has submitted the supporting documents of the recent price discovery of rice husk through tender by Chhattisgarh State Cooperative Marketing Federation Ltd. The prices discovery of rice husk was in the range of Rs. 2335/MT to Rs. 3424/MT, which includes transportation charges up to the Collection Centres.

Analysis and Decision

31.4 In the absence of any detailed analysis on biomass price, the Commission has decided to retain the proposed biomass price for the State of Telangana.

31.5 The Commission has reviewed the submissions in respect of Chhattisgarh and is of the view that the data submitted is State-specific. Further, the biomass price specified by Chhattisgarh State Electricity Regulatory Commission is in line with biomass price specified by CERC for other States. As the data submitted in respect of Chhattisgarh is yet to be validated by CSERC, the Commission has decided to continue with the provisions as per Draft Regulations.

Chapter 6: Parameters for non-fossil fuel based co-generation projects

32 Capital Cost

Commission's Proposal

32.1 The capital cost of non-fossil fuel based co-generation projects was proposed as under as per Regulation 39 of the Draft Regulations:

"39. Capital Cost



Normative capital cost for the non-fossil fuel based co-generation projects shall be Rs. 492 lakhs/MW for the first year of Control Period i.e. financial year 2020-21 and will remain valid for the entire duration of the Control Period unless reviewed earlier by the Commission."

Comments Received

32.2 **Shree Ganesh Edibles Pvt. Ltd.** has requested to increase the capital cost based on the completed cost of the sample projects selected at random duly certified by CA in FY 2019-20, for the first year of Control Period, i.e., FY 2020-21, or otherwise allow appropriate increase in the frozen capital cost of previous Control Period. Further, it has requested to provide indexation mechanism for remaining years of the Control Period.

32.3 **Indian Sugar Mills Association (ISMA)** has submitted that the new sugar mills are being established with a view to co-generate power, for which they are opting for high pressure boilers, which involves huge capital investment. The mills have to construct dedicated transmission lines from the sugar mill to the nearest 132 kV sub-station, which also involves capital investment. Hence, it must also be considered in the Capital cost. Sugar Development Fund, established by the Ministry of CA, Food & PD, which finances the co-generation projects of sugar mills, has fixed the normative capital cost for a project having 110 kg boiler and above, at Rs. 543 lakh per MW. The cost was fixed in 2016 and if the cost of raw material is escalated at 5% per annum, the cost would now work out to about Rs. 650 lakh per MW. Hence, the capital cost for non-fossil fuel based co-generation projects should be considered at a minimum of Rs. 650 lakh/MW.

Analysis and Decision

32.4 Due to lack of actual project data of non-fossil fuel based co-generation projects, the Commission has decided to consider the capital cost determined for the previous year. Further, the Commission while framing the previous RE Tariff Regulations has considered higher capital cost to encourage and ensure deployment of high-pressure boilers, which are more efficient in nature. Accordingly, the Commission has decided to retain the capital cost as specified in the Draft Regulations.

33 Plant Load Factor

Commission's Proposal

33.1 PLF of non-fossil fuel based co-generation projects was proposed as under as per Regulation 40 of the Draft Regulations:

"40. Plant Load Factor

The plant load factor for different States shall be as follows:

State	Plant Load Factor (%)
Uttar Pradesh and Andhra Pradesh	45%
Tamil Nadu and Maharashtra	60%
Other States	53%

Comments Received

33.2 ISMA submitted that the number of operating days for Bihar, Chhattisgarh, Madhya Pradesh, Maharashtra, Punjab, Rajasthan, Telangana and Uttarakhand is around 120 days. Therefore, these States should be considered along with Uttar Pradesh and Andhra Pradesh and PLF for these States may be fixed at 45%, while rest of the States may continue under “Other States” with PLF of 53%.

33.3 Further, ISMA has submitted the actual average operating days of Andhra Pradesh, Tamil Nadu, Maharashtra and “Other States” during the last 5 years, as tabulated hereunder:

STATES	No. of Working Days (Simple Average) during last 5 years				
	2018-19	2017-18	2016-17	2015-16	2014-15
Bihar	141	126	104	94	101
Uttar Pradesh	165	178	139	111	125
Chhattisgarh & Madhya Pradesh	120	116	92	92	128
Maharashtra	128	137	67	116	149
Punjab	148	156	133	136	128
Tamil Nadu & Puducherry	130	97	116	145	124
Telangana	113	122	60	114	105
Andhra Pradesh	99	93	81	104	92
Uttarakhand	134	146	117	107	115

Analysis and Decision

33.4 The Commission is of the view that the use of high-pressure boilers will result in an increase in overall efficiency of the plant. Thus, the benefit of installing high-pressure boilers shall be passed on to consumers. On the suggestion of including Bihar, Chhattisgarh, Madhya Pradesh, Maharashtra, Punjab, Rajasthan, Telangana and Uttarakhand along with Uttar Pradesh and Andhra Pradesh, the Commission is of the view that these changes can be made only after detailed study in this regard. As such, the provision of Draft Regulations has been retained in the CERC RE Tariff

Regulations, 2020.

34 Auxiliary Consumption

Commission's Proposal

34.1 The auxiliary consumption of non-fossil fuel based co-generation projects was proposed as under as per Regulation 41 of the Draft Regulations:

"41. Auxiliary Consumption

The auxiliary consumption shall be considered as 8.5% for the computation of tariff"

Comments Received

34.2 ISMA submitted that both, bagasse-based co-generation units and bio-mass based power projects work under identical conditions by employing almost same equipment. Hence, auxiliary consumption for bagasse-based plants should be fixed at par with that of biomass power projects. In a bagasse-based cogeneration plant, power consumption is more than 10% since the sugarcane milling and boiling house consumes more power for every tonne of sugarcane crushed. Bagasse based plants are also switching over to air-cooled condensers. Therefore, ISMA requested to consider the auxiliary consumption for bagasse-based plants at par with that of bio-mass power projects.

Analysis and Decision

34.3 Typically, bagasse requires less processing as compared to biomass. Considering this fact, the Commission has specified the norm of auxiliary consumption lower than the auxiliary consumption norm for biomass-based projects. Hence, the Commission decides to retain the same norm of auxiliary consumption for non-fossil fuel based co-generation projects as proposed in the Draft Regulations.

35 Station Heat Rate

Commission's Proposal

35.1 SHR of non-fossil fuel based co-generation projects was proposed as under as per Regulation 42 of the Draft Regulations:

"42. Station Heat Rate

The Station Heat Rate of 3600 kCal/ kWh for power generation component alone shall be considered for computation of tariff for non-fossil fuel based co-generation projects."

Comments Received

35.2 ISMA submitted that SHR for non-fossil fuel based cogeneration projects should be at par with the SHR fixed for biomass based cogeneration plants.

Analysis and Decision

35.3 This needs detailed study and the developers may submit the details and the Commission's staff can examine this aspect. As of now, the provision as proposed in the Draft Regulations has been retained in the CERC RE Tariff Regulations, 2020.

36 Fuel Cost

Commission's Proposal

36.1 The fuel cost for non-fossil fuel based co-generation projects was proposed as under as per Regulation 44 of the Draft Regulations:

"44. Fuel Cost

(1) *The price of bagasse for first year of the Control Period i.e. financial year 2020-21 shall be as specified in the table below and shall be escalated at the rate of 5% per annum to arrive at the base price for subsequent years of the Control Period, unless specifically reviewed by Commission. For the purpose of determining levelized tariff, a normative escalation factor of 5% per annum shall be applicable on bagasse prices.*

<i>State</i>	<i>Bagasse Price for FY 2020-21 (Rs. /MT)</i>
<i>Andhra Pradesh</i>	1878
<i>Haryana</i>	2671
<i>Maharashtra</i>	2632
<i>Punjab</i>	2351
<i>Tamil Nadu</i>	2023
<i>Telangana</i>	1877
<i>Uttar Pradesh</i>	2095
<i>Other States</i>	2274

(2) *For use of biomass other than bagasse in non-fossil fuel based co-generation projects, the biomass prices as specified under Regulation 38 shall be applicable."*

Comments Received

36.2 **The South Indian Sugar Mill Association (SISMA) Andhra Pradesh** has cited various data sources and direction of APTEL and requested to fix the bagasse price at Rs.2362.50/MT for FY 2020-21 applicable for Andhra Pradesh with annual normative escalation of 5% of base price.

36.3 **The South Indian Sugar Mill Association (SISMA) Tamil Nadu** has cited various data sources, direction of APTEL and requested to fix the bagasse price at Rs.2700/MT for FY 2020-21 applicable for Tamil Nadu with annual normative escalation of 5% of base price.

36.4 **The Indian Sugar Mill Association (ISMA)** has submitted that since all the States are paying uniform Fair & Remunerative Price (FRP) for sugarcane as fixed by

the Union Government, there cannot be any difference in cost of bagasse to be considered for fixation of tariff. ISMA submits that price of bagasse for Andhra Pradesh and Telangana be fixed at par with that fixed for Tamil Nadu or other States.

36.5 **PCKL and KPTCL** requested to not consider any charges for bagasse apart from handling charges of Rs. 100-200 per MT at the most as sugarcane is a by-product of sugar industry.

36.6 Further, **PCKL** suggested that the cogeneration plant should work only when sugarcane crushing is undertaken and purchase of bagasse from outside should not be considered, which will ensure that bagasse need not be priced considering market value for purchase.

Analysis and Decision

36.7 The Commission has observed that some stakeholders have proposed to increase the price of fuel. However, there are views that there should not be any provision for fuel cost for bagasse based co-generation plants as bagasse is a by-product of sugarcane crushing while manufacturing sugar and this cost is already included by the State Governments in sugar pricing. The Commission is of the view that fuel prices should be considered for bagasse based cogeneration plant for the purpose of tariff determination.

36.8 Due to the lack of actual project data of the non-fossil fuel based co-generation projects, the Commission has determined the bagasse price by escalating the last year's bagasse price by 5%. Accordingly, the Commission has retained the fuel prices specified in the Draft Regulations.

Chapter 7: Parameters for solar PV power projects, solar thermal power projects and floating solar projects

37 Capital Cost

Commission's Proposal

37.1 The capital cost of solar projects was proposed as under as per Regulation 46 of the Draft Regulations:

"46. Capital Cost

The Commission shall determine only project specific capital cost considering the prevailing market trends."

Comments Received



37.2 NTPC submitted that while comparing capital cost with market trends, the reference plants to be considered should be located in the geographical vicinity and should be designed with similar CUFs, and Regulations 46 and 48 should be modified as under:

“The Commission shall determine only project specific capital cost/ O&M expenses considering the prevailing market trends and data for projects in the geographical near vicinity and having comparable CUF.”

Analysis and Decision

37.3 The Commission is of the view that solar is a mature technology and a greater number of projects are coming under the framework of competitive bidding. There is, however, an option for project specific tariff for solar projects. However, while determining such tariff, other site specific issues will be duly considered and there is no need to specifically mention the same. Hence, the Commission has decided to retain the existing norms as provided in the Draft Regulations.

38 Capacity Utilisation Factor

Commission’s Proposal

38.1 CUF of solar projects was proposed as under as per Regulation 47 of the Draft Regulations:

“47. Capacity Utilisation Factor

The Commission shall only approve capacity utilisation factor for project specific tariff:

Provided that the minimum capacity utilization factor for solar PV power projects shall be 21%:

Provided further that the minimum capacity utilization factor for solar thermal power projects shall be 23%:

Provided also that the minimum capacity utilisation factor for floating solar projects shall be 19%.”

Comments Received

38.2 **Mangal Industries Ltd.** has sought clarification regarding the period up to which the 21% CUF of solar PV power projects are applicable, as CUF reduces over a period due to ageing.

38.3 **The Tata Power Company Ltd.** has requested to consider the minimum CUF of 16% and 0.5% per annum degradation for solar PV power projects, as CUF is a site specific parameter and may vary from 16% to 21%, whereas degradation of generation capacity varies from 0.5-1.0% per annum depending upon guarantees provided by PV module suppliers.

38.4 **Greenko** and **NSEFI** have suggested that the normative CUF for solar PV should be 19%.

38.5 **ACME** has requested to include provision for no ceiling on CUF and provision for procurement of total energy generated by solar Power project by beneficiaries. Further, for the purposes of computing CUF, energy delivered at interconnection point, i.e., delivery point as per PPA, should be considered.

38.6 **RUMSL** suggested to provide the minimum capacity utilization factor for solar PV power projects as 19%, considering the fact that the solar power projects installed in North Eastern States/ States with lower solar radiation may not achieve minimum CUF of 21% and citing SERCs such as Karnataka and Tamil Nadu, which consider the CUF of 19% in their Generic Tariff Order.

38.7 **Bask Research Foundation** submitted that CUF of 21% for solar PV projects is not possible in Indian conditions for DC to AC ratio of 1, i.e., where solar PV capacity is equal to capacity of inverters installed. CUF of 18% is suggested for DC-AC ratio of 1. It suggested the following method for determination of CUF:

$$\text{Capacity Utilisation Factor} = 18\% \times (\text{solar PV DC Capacity Installed} / \text{Sanctioned AC capacity})$$

38.8 **APP** requested to consider the zone-wise categorization of CUF of solar PV/ solar thermal/ floating solar plants, on the basis of different GHI/ DNI measurements and different CUF values in different States in order to determine different tariffs for different zones. Further, it has proposed that the actual generation data from solar plants located at different regions/ States may be considered for determination of zone-wise normative CUF/ PLF.

38.9 **NTPC** submitted that the floating solar PV project and solar PV projects are using same technology for generation, and the minimum CUF for solar PV project and floating solar PV project should be same, i.e., 21%, for tariff determination. NTPC also reiterated its previous suggestion regarding CUF of solar and wind projects that developers should be allowed to declare design CUF, which can be above minimum specified CUF and the project developer should be allowed to revise its design CUF during first year of the operation. NTPC also reiterated that the developer should be allowed to have a band (range) of CUF between maximum and minimum CUF, as solar irradiation may vary from year to year. NTPC pointed out that the GoI Guidelines for Tariff Based Competitive Bidding for solar PV Projects also provides for "Range of Capacity Utilization Factor" (Clause-5.2.1).

38.10 **NTPC** has also submitted that the Commission should allow solar CUF degradation factor of 0.7%. In addition, NTPC suggested that the developer should be allowed additional capitalization to re-power the solar PV project after the

identified useful life, to overcome the module degradation and to meet the committed generation. The provision for re-powering by solar generator is provided in the GoI Guidelines for Tariff Based Competitive Bidding for Solar Projects (Clause 5.2.3). For projects wherein tariff is determined under Section-62, such re-powering needs to be funded through additional capitalization.

38.11 **Radiance Renewables** has requested the Commission to retain the existing norms considering the technical constraints to attain higher DC-AC Ratio and its impact on over-generation.

Analysis and Decision

38.12 The Commission observes that majority of the State ERCs do not consider the derating factor for the solar PV panels. Also, quality and efficiency of new solar PV panels has increased. Considering the above, the Commission has retained the CUF norms as specified in the Draft Regulations.

38.13 The prevailing market trend of CUF has been in the range of 21% and above and with advancement of technology in the solar sector, the project developer can easily attain the minimum CUF of 21%.

38.14 As regards the suggestion of zone-wise categorisation, it may be underscored that unlike wind resources, solar resource is fairly homogenous within State boundaries and very few States see significant variation across districts.

38.15 Solar modules are used in floating solar project. However, because of change in ambient conditions, i.e., high ambient moisture content combined with UV exposure makes plants susceptible to higher degradation. All metallic components near water level are susceptible to corrosion. There is probability of water ingress in PV modules and modules with higher protection against moisture and UV should be used in floating solar applications – glass-glass modules or modules with high specification protective backsheets. In view of the above, CUF of floating solar power project as 19% is retained.

39 Auxiliary Consumption

Commission's Proposal

39.1 Auxiliary consumption for solar projects was proposed as under as per Regulation 49 of the Draft Regulations:

"49. Auxiliary Consumption

The Commission shall only approve auxiliary consumption for project specific tariff:

Provided that the maximum auxiliary consumption for solar PV power projects shall be 0.25%;



Provided further that the maximum auxiliary consumption for solar thermal power projects shall be 10%;

Provided also that the maximum auxiliary consumption for floating solar projects shall be 0.25%."

Comments Received

39.2 **The Tata Power Company Ltd.** has requested to consider 1% auxiliary consumption for solar power plants, as the transformer is energized throughout the night. Hence, core losses are bound to be there in the range of 0.5%-0.75%. Considering other auxiliary consumption such as module cleaning, etc., and load losses, auxiliary consumption may go up to 1%.

39.3 **ACME** has requested to consider auxiliary consumption based on project capacity as smaller projects cannot operate with 0.25% auxiliary consumption and suggested auxiliary consumption of 1.5% for solar PV power projects having capacity up to 25 MW, and auxiliary consumption of 0.75% for capacity above 25 MW. Further, it has submitted that few States levy very high tariff for such auxiliary consumption while the tariff is very low under the PPA and hence, auxiliary consumption must be netted off against the export power.

39.4 **NTPC** has requested the to consider the normative APC (auxiliary power consumption) of 2.75% for solar PV project and floating solar PV project. For instance, in case of Bhadla Solar Power Project, APC for FY 2017-18, FY 2018-19, and FY 2019-20 was 2.92%, 2.64%, and 2.66%, respectively. NTPC also submitted that the power consumed by solar project auxiliaries during non-solar (night) hours should also be considered as part of APC. Therefore, APC of solar PV/ floating solar PV project should be calculated on net export basis.

Analysis and Decision

39.5 It is observed that for grid connected projects, auxiliary consumption also includes the losses of transformer apart from other auxiliary consumption such as consumption towards solar trackers, lighting, module cleaning, etc.

39.6 Earlier, for hydro power plants, in addition to the auxiliary consumption, transformation losses of 0.5% were also allowed separately. In line with the similar approach, the Commission is of the view that the transformation loses of 0.5% also needs to be allowed for grid connected Solar PV projects.

39.7 In view of the above, the Commission has decided to revise the maximum auxiliary consumption norm for solar PV power projects and floating solar projects to 0.75%. Suitable provision has been made accordingly in the CERC RE Tariff

Chapter 10: Parameters for municipal solid waste based projects and refuse derived fuel based power projects

40 Uniform Tariff across the Country

Comments Received

40.1 **Ramky Enviro Engineers Limited** has requested to consider both RDF and MSW on same lines while defining the norms. Hence, it has requested to consider standard normative parameters for national tariff uniformly across India without any distinction between the MSW and RDF based models and has proposed single name Municipal Waste to Energy (MWTE) sector all across on thermal combustion basis, Rankine cycle. It has also requested to specify obligation to Discoms to procure 100% power from waste-to-energy (WTE) plants and not to consider the same under RPO norms. It has further requested to not consider tipping fee, grants and subsidies that may be provided by Urban Local Bodies (ULBs) to project developers while determining the tariff. It has proposed that levelized tariff of Rs. 8.75/kWh as a single tariff should be prescribed as a National Tariff for waste-to-energy projects for the whole nation.

40.2 **Hitachi Zosen India Private Limited** and **JBM Environment Management Pvt Ltd** have requested to consider uniform tariff across India for WTE projects so that lenders are also comfortable to manage the project.

40.3 **Hyderabad MSW Energy Solutions Pvt. Limited** has requested to consider uniform tariff for both MSW and RDF plants.

Analysis and Decision

40.4 At present, there is no actual data available for MSW Plants and any decision on the suggestions can be made after detailed study while determining project specific tariff. Hence, the Commission has decided to retain the norms specified in Draft Regulations.

41 Capital Cost

Commission's Proposal

41.1 The capital cost of MSW and RDF projects was proposed as under as per Regulation 62 of the Draft Regulations:

"62. Capital Cost

The Commission shall determine only project specific capital cost considering the

prevailing market trends”

Comments Received

41.2 **Ramky Enviro Engineers Limited** has requested to consider uniform capital cost for RDF and MSW projects of Rs. 18 crore/MW.

41.3 **IL&FS** has requested to consider the capital cost in the range of Rs. 15-18 crore/MW.

Analysis and Decision

41.4 At present, there is no actual data available for MSW Plants. No limit on capital cost has been specified for project-specific tariff and site-specific deviations may be considered while determining project specific tariff. Hence, the Commission has decided to retain the norms as specified in the Draft Regulations.

42 Plant Load Factor

Commission’s Proposal

42.1 PLF of MSW and RDF projects was proposed as under as per Regulation 63 of the Draft Regulations:

“63. Plant load Factor

(1) Plant load factor for determining tariff for municipal solid waste based power projects and refuse derived fuel based power projects shall be:

<i>Sl No.</i>	<i>Plant load Factor</i>	<i>MSW</i>	<i>RDF</i>
<i>a)</i>	<i>During stabilisation period</i>	<i>65%</i>	<i>65%</i>
<i>b)</i>	<i>During the remaining period of the first year (after stabilization period)</i>	<i>65%</i>	<i>65%</i>
<i>c)</i>	<i>2nd year onwards</i>	<i>75%</i>	<i>80%</i>

“(2) The stabilisation period shall not be more than 6 months from the date of commercial operation of the project.”

Comments Received

42.2 **Ramky Enviro Engineers Limited** has requested the to consider uniform PLF for RDF and MSW projects as 65% for first year and 75% from second year.

42.3 **IL&FS** has requested to consider PLF of 75% for RDF from second year.

Analysis and Decision

42.4 In absence of actual data for MSW plants at present, the Commission has decided to retain the norms as specified in the Draft Regulations.

43 Auxiliary Consumption

Commission's Proposal

43.1 The auxiliary consumption of MSW and RDF projects was proposed as under as per Regulation 64 of the Draft Regulations:

"64. Auxiliary Consumption

The auxiliary consumption for determination of tariff shall be considered as 15%."

Comments Received

43.2 **Ramky Enviro Engineers Limited** has requested to consider auxiliary consumption of 16% for RDF and MSW projects.

43.3 **IL&FS** has requested to consider auxiliary consumption as 15% to 20% of the power generated due to higher in-house consumption.

Analysis and Decision

43.4 In the absence of actual data for MSW Plants at present, the Commission has decided to retain the norms as specified in the Draft Regulations.

44 Operation and Maintenance Expenses

Commission's Proposal

44.1 The O&M expenses of MSW and RDF projects was proposed as under as per Regulation 66 of the Draft Regulations:

"66. Operation and Maintenance Expenses

The Commission shall determine only project specific O&M expenses considering the prevailing market trends."

Comments Received

44.2 **Ramky Enviro Engineers Limited** has requested to consider O&M expenses as 7.5% of Capital Cost with 5% annual escalation.

44.3 **IL&FS** has requested to consider O&M expenses as 7% to 8% of the Capital Cost with 5.72% annual escalation.

Analysis and Decision

44.4 The project specific tariff has not specified any limit on O&M expenses and site-specific deviations may be considered while determining project specific tariff. Hence, the Commission has decided to retain the norms as specified in the Draft Regulations. As far as annual escalation rate is concerned, the issue has been deliberated in earlier sections.

45 Gross Calorific Value

Commission's Proposal

45.1 GCV for MSW and RDF projects was proposed as under as per Regulation 67 of the Draft Regulations:

"67. Gross Calorific Value

(1) The gross calorific value of RDF for the purpose of determination of tariff shall be at 2500 kcal/kg."

"(2) The gross calorific value of MSW shall be determined by the Commission on a case to case basis while determining projects specific tariff."

Comments Received

45.2 **Ramky Enviro Engineers Limited** has requested to consider GCV for RDF and MSW projects as 1500 kcal/kg.

Analysis and Decision

45.3 Any decision on the suggestions can be made after detailed study. Hence, the Commission has decided to retain the norms specified in the Draft Regulations.

46 Fuel Cost

Commission's Proposal

46.1 The Fuel Cost for MSW and RDF projects was proposed as under as per Regulation 68 of the Draft Regulations:

"68. Fuel Cost

(1) Price of refuse derived fuel during financial year 2020-21 shall be considered as Rs.2084 per MT and shall be escalated at the rate of 5% per annum to arrive at the base price for subsequent years of the Control Period, unless specifically reviewed by Commission. For the purpose of determining levelized tariff, a normative escalation factor of 5% per annum shall be applicable."

"(2) Fuel cost shall be considered as nil for municipal solid waste."

"Provided that the Commission may consider allowing transportation cost of such fuel while determining the project specific tariff"

Comments Received

46.2 **Gujarat Biomass Energy Development Association** has requested the Commission to consider 15% usage of fossil fuel for the WTE plants as WTE plants have no control over incoming waste physical characteristics and composition,

including moisture content, which provides extreme variation in MSW/ RDF especially during monsoon period. Therefore, auxiliary support fuel may be necessary to maintain optimal combustion temperatures and to comply with prescribed environmental standards. Further, it has requested to clarify whether biomass/WTE plants may use any other non-fossil fuel or biofuels as defined by MNRE to support the operation of the plant as this will support the overall objective of Swachh Bharat Mission and also enable processing and disposal of waste in rural and urban areas.

Analysis and Decision

46.3 These issues need detailed study and the developers may submit details of the project. As of now, the provision as proposed in the Draft Regulations has been retained in the final Regulations.

Chapter 11: Parameters for Renewable Hybrid Energy Projects

47 Capacity Utilisation Factor

Commission's Proposal

47.1 The CUF for Renewable Hybrid Energy projects was proposed as under as per Regulation 70 of the Draft Regulations:

“ 70. Capacity Utilisation Factor

(1) The Commission shall determine only project specific capacity utilisation factor in respect of renewable hybrid energy projects taking into consideration the proportion of rated capacity of each renewable energy source, as the case may be, and applicable capacity utilisation factor for such renewable energy source, as the case may be:

Provided that the minimum capacity utilization factor for renewable hybrid energy project shall be 30% when measured at the inter-connection point.”

Comments Received

47.2 **Rudraksh Energy** has requested to consider project specific determination of CUF for hybrid RE project of wind and solar as it may not be possible to achieve minimum CUF of 30%.

47.3 **Greenko** and **NSEFI** have requested to consider the minimum CUF of 45% for renewable hybrid energy project when measured at the inter-connection point and cited the example of recent tender floated by SECI, which has minimum CUF of 40% for hybrid project.

47.4 **Solar Energy Corporation of India (SECI)** has suggested the following modification in the provision for CUF of renewable hybrid energy projects:



“The Commission shall determine only project specific capacity utilisation factor in respect of renewable hybrid energy projects taking into consideration the proportion of rated capacity of each renewable energy source, as the case may be, and applicable capacity utilisation factor for such renewable energy source, as the case may be:

*Provided that the minimum capacity utilization factor for renewable hybrid energy project shall be 30% when measured at **all** the inter-connection points **considering multiple injection points.**”*

47.5 NTPC has commented that as floating solar PV Project and solar PV project generate energy on the same principle, the combined CUF of the project will not be more than CUF of solar PV Power Project. These two projects in combination should not be treated as hybrid energy project. Also, the requirement of minimum CUF of 30% for hybrid energy project cannot be met by a project comprising of solar PV and floating solar PV project.

Analysis and Decision

47.6 The Commission, considering the MNRE Guidelines for hybrid projects, has specified minimum CUF of 30%. Further, SECI in its recent tenders has also kept minimum CUF of 30%. Hence, the Commission has retained the norm of minimum CUF as specified in the Draft Regulations.

47.7 As regards the consideration of multiple injection points, the Commission is of the view that it may lead to complexity and has decided not to allow the same in the CERC RE Tariff Regulations, 2020.

47.8 It is correct that a combination of solar PV projects (ground mounted) and floating solar must be excluded from the scope of renewable hybrid energy projects. The same has been addressed in Regulation 4 of CERC RE Tariff Regulations, 2020. Hence, the project specific tariff of a hybrid of a floating solar and any other solar renewable energy resources shall not be considered under the scope of renewable hybrid sources.

48 Tariff

Commission’s Proposal

48.1 The tariff for renewable hybrid energy projects was proposed as under as per Regulation 72 of the Draft Regulations:

“72. Tariff

The tariff for a renewable hybrid energy project shall be a combined tariff for the project as a whole.”

Comments Received

48.2 GRIDCO has suggested that as per the given description of useful life of renewable hybrid energy project, fixed cost for 'other Units having life more than that of the one having minimum life' should be apportioned for useful life of the hybrid project and the fixed cost component towards balance unutilized life of the 'other Units having life more than that of the one having minimum life' should not be passed on to the beneficiaries.

Analysis and Decision

48.3 The Commission after considering the implications of the change in useful life for various renewable energy technologies has made changes in the tariff determination framework for renewable hybrid energy project. There will be composite levelized tariff for the renewable hybrid energy project as a whole up to the minimum of the useful life of the RE technologies and after the useful life of one technology is over, separate tariff will be approved for the remaining useful life, if any of other technology.

Chapter 12: Parameters for Renewable Energy with storage project

49 Capital Cost

Commission's Proposal

49.1 The capital cost for renewable energy projects with storage was proposed as under as per Regulation 73 of the Draft Regulations:

"73. Capital Cost

The Commission shall determine only project specific capital cost for renewable energy with storage project considering the prevailing market trends"

Comments Received

49.2 **Solar Energy Corporation of India (SECI)** has suggested that there should be treatment or provision for replacement cost of the storage either on upfront basis as part of O&M charges accrued as replacement reserve or to approach Commission with actual cost incurred for replacement in the mid-course of the project. Hence, the proposed provision are as follows:

*"The Commission shall determine only project specific capital cost for renewable energy with storage project considering the prevailing market trends **including for the cost to be incurred for any replacements/augmentation.**"*

49.3 NTPC submitted that life of battery storage system is around 10 years, which is lower than the useful life of other renewable (solar/ wind) projects. Therefore, RE

generator should be allowed additional capitalization for replacement of battery storage system after its designated useful life to match with the remaining project useful life.

Analysis and Decision

49.4 As the renewable energy storage sources are at nascent stages of development, the determination of capital cost of storage cannot be benchmarked. Also, the configuration of storage depends upon RE technologies and applications. Since additional capitalization forms a component of capital cost, the same may be considered while determining the tariff on project specific basis.

50 Storage Efficiency

Commission's Proposal

50.1 The storage efficiency for renewable energy projects with storage was proposed as under as per Regulation 74 of the Draft Regulations:

"74. Storage Efficiency

(1) The Commission shall approve the storage efficiency only for project specific tariff:

Provided that the minimum efficiency for storage based on technology of solid state batteries shall be 80%:

Provided further that the minimum efficiency for storage based on technology of pumped storage shall be 75%:

(2) Efficiency of storage component of renewable energy with storage project shall be measured as ratio of output energy received from storage and input energy supplied to the storage component of such project, on annual basis."

Comments Received

50.2 **Cargo Solar Power (Gujarat) Private Limited** has requested to introduce separate guidelines (parameters) for solar thermal power project with storage as no such provision exists in India. Further, CUF of solar thermal power project with storage is more than the plant without storage, which is CUF of 58% with storage and 23% without storage. In addition, the plant with storage will ensure 24 hours renewable power production, which is more reliable, stable, efficient, and dispatchable to meet grid requirement and has potential to replace fossil fuel power plant.

50.3 **ACME** has requested the Commission to consider project specific selection of technology for storage based projects and its efficiency as opted by developer, as efficiency of storage varies between 40% to 90% and so does the capital cost.

50.4 NTPC has suggested minimum efficiency for storage based on technology of solid state batteries to be considered as 70% as some of the battery storage systems like NAS battery and flow batteries have less than 80% efficiency. Also, NTPC suggested to consider generator's own choice to adopt battery technology depending upon techno-economic consideration and life of different batteries. NTPC also suggested that DC coupled battery storage may also be allowed in addition to AC coupled battery.

Analysis and Decision

50.5 The Commission after considering the importance of the storage system, has proposed to include the regulatory framework to promote use of Energy Storage System (ESS) along with renewable energy project. As the renewable energy storage sources are in the nascent stage of development, the norms have been specified for the traditional storage technology such as pumped storage and battery storage.

50.6 For RE storage project, the use of ESS depends on the application of the project. RE generator may use ESS to enhance the supply of power to the Distribution Licensee, ancillary market or open market, by shifting of generation when demand is higher. While proposing the framework, the Commission has not limited the technology selection of ESS as well as sizing of ESS. As such, the Commission has decided to retain the storage efficiency norms as specified in the Draft Regulations.

51 Tariff Determination for Energy Storage

Commission's Proposal

51.1 The tariff for Renewable Energy projects with storage was proposed as under:

"The tariff for renewable energy with storage project shall be a composite tariff determined for energy supplied from the Project including the energy supplied from storage facility:

Provided that such tariff may be determined for supply of power on round the clock basis or for time periods as agreed by Project Developer and Beneficiary."

Comments Received

51.2 **Solar Energy Corporation of India (SECI)** has suggested that there should be provision for the tariff to be single composite tariff for the complete duration of the day or as two-part tariff for peak hours and non-peak hours. Hence, the proposed provisions are as follows:

*"The tariff for renewable energy with storage project shall be a **two part or** composite tariff determined for energy supplied from the Project including the energy supplied from storage facility:*

Provided that such tariff may be determined for supply of power on round the clock basis or for time periods as agreed by Project Developer and Beneficiary."

51.3 **Radiance Renewables** has requested to provide separate tariffs for peak and off-peak generation to incentivise the RE generators, which can contribute towards maintaining the quality of grid supply.

Analysis and Decision

51.4 The Commission has noted and analysed the suggestions provided by the stakeholders regarding the tariff computation based on Time of Day (TOD) and modified the Regulation 76 accordingly.

52 Miscellaneous

A. Must Run Provisions

52.1 Several stakeholders have requested to provide must run status to renewable energy projects.

Analysis and Decision

52.2 Issue of must run status is related to the Grid Code and is outside the purview of the current Regulations.

B. RPO Provisions

52.3 Several stakeholders have raised issues regarding Renewable Purchase Obligations.

Analysis and Decision

52.4 This issue pertains to REC Regulations and is outside the scope of the present Regulations.

C. CDM Provisions

52.5 **GRIDCO** has requested to retain the existing provisions of Sharing of CDM Benefits in RE Tariff Regulations, 2017 as omission of the Regulation on 'Sharing of CDM Benefits' violates Section 61(d) of the Act, which mandates 'safeguarding of consumers' interest'.

Analysis and Decision

52.6 The CDM benefits are not applicable now.

D. Open Access (OA) Provisions

52.7 Several stakeholders have given comments on the issues related to open access provisions for Renewable Energy.

Analysis and Decision



52.8 These issues pertain to Open Access Regulations and are outside the scope of the present Regulations.

E. Change in Law Provisions

52.9 **PTC India** has requested to consider any change in input parameters by statutory authority including lenders including revision in MCLR rate under Change in Law and revise the tariff accordingly.

52.10 **RUMSL** requested to provide mechanism to deal with change in law and its impact on the tariff for the life of the project. It further stated that introduction of new laws like GST or application of safe-guard duty or custom duty on imported modules, creates a situation in which developers might not be able to recover the cost of a project at the discovered tariff due to unexpected increase in capital cost. Since, most of the procurers are Distribution Licensees and are governed by the State Regulations, which do not have any provision for making upfront payments on such bills, procurers would prefer to convert those additional cost into the tariff. However, tariffs are competitively determined and PPAs do not have such provision to change tariff based on change in Capex. This demands for the requirement of Change in Law provision to ensure the recovery of Capex and supports the procurer's upfront payment capability.

Analysis and Decision

52.11 The Commission is of the view that the Change in Law is part of the PPA and needs to be dealt as per the provisions of PPA. Hence, this issue does not fall under the purview of present Regulations.

F. Standalone Pumped Storage Provision

52.12 **Greenko** and **NSEFI** have suggested that standalone pumped storage system being part of renewable energy system has to be brought under these Regulations. In current scenario, pumped storage system is highly significant with RE and same has been covered within scope of these Regulations too.

Analysis and Decision

52.13 The pumped storage system has already been included in the CERC (Terms and Conditions for Tariff determination from Renewable Energy Sources) Regulations, 2019 and does not fall under the purview of the current Regulations.

Sd/-
(Arun Goyal)
Member

Sd/-
(I. S. Jha)
Member

Sd/-
(P.K. Pujari)
Chairperson



Annexure I - List of Stakeholders who submitted the written comments/suggestions/objections

- 1) ACME Solar Holdings Limited (ACME)
- 2) Ascent Hydro Projects Limited
- 3) Association of Power Producers (APP)
- 4) Azure Power India Private Limited (Azure Power)
- 5) Bask Research Foundation
- 6) Biomass Energy Developers Association
- 7) Bonafide Himachalies Hydro Power Developers Association
- 8) Cargo Solar Power (Gujarat) Private Ltd.
- 9) CESC Limited
- 10) Chhattisgarh State Power Distribution Company Ltd (CSPDCL)
- 11) Citizen's Feedback Report
- 12) Enel Green Power India Private Ltd.
- 13) Greenko Energy Private Limited (Greenko)
- 14) Grid Corporation of Odisha (GRIDCO)
- 15) Gujarat Biomass Energy Developers Association
- 16) Haldia Energy Limited
- 17) Himalaya Power Producers Association (HPPA)
- 18) Indian Renewable Energy Development Agency Limited (IREDA)
- 19) Indian Sugar Mills Association (ISMA)
- 20) Indian Wind Power Association (IWPA)
- 21) Indian Wind Power Association- Northern Region Council (IWPA (NRC))
- 22) Indian Wind Turbine Manufacturers Association (IWTMA)
- 23) Karnataka Power Transmission Corporation Ltd. (KPTCL)
- 24) Mangal Industries Ltd.
- 25) National Solar Energy Federation of India (NSEFI)
- 26) National Thermal Power Corporation (NTPC)
- 27) Power Company of Karnataka Limited (PCKL)
- 28) PTC India Ltd.
- 29) Radiance Renewables Private Limited (Radiance Renewables)
- 30) Ramky Enviro Engineers Limited
- 31) ReNew Power Private Limited (ReNew Power)
- 32) Rewa Ultra Mega Solar Limited (RUMSL)
- 33) Rudraksh Energy (Division of Rudraksh Tradelinks Ltd.)
- 34) Shree Bhavani Power Projects Private Ltd.
- 35) Shree Ganesh Edibles Private Ltd.

- 36) Solar Energy Corporation of India (SECI)
- 37) Tata Power Company Limited
- 38) The South Indian Sugar Mill Association, Andhra Pradesh- (SISMA - AP)
- 39) The South Indian Sugar Mill Association, Tamil Nadu - (SISMA - TN)
- 40) Torrent Power Limited
- 41) Varun Jal Vidyut Shakti Pvt Ltd
- 42) Venika Hydro Projects Private Ltd.

Annexure II - List of Stakeholders who presented their comments/suggestions/objections during Public Hearing

- 1) Cargo Solar Power (Gujarat) Private Ltd.
- 2) Chhattisgarh State Power Distribution Company Ltd (CSPDCL)
- 3) Dr. Anoop Singh - IIT Kanpur
- 4) Greenko Energy Private Limited (Greenko)
- 5) Grid Corporation of Odisha (GRIDCO)
- 6) Hitachi Zosen India Private Limited
- 7) Hyderabad MSW Energy Solutions Pvt. Limited
- 8) IL&FS Energy Development Company Limited (IL&FS)
- 9) Indian Sugar Mills Association (ISMA)
- 10) JBM Environment Management Pvt Ltd
- 11) National Thermal Power Corporation (NTPC)
- 12) Prozeal Infra Engineering Private Limited
- 13) PTC India Ltd.
- 14) Ramky Enviro Engineers Limited
- 15) Rudraksh Energy (Division of Rudraksh Tradelinks Ltd.)
- 16) Shree Bhavani Power Projects Private Ltd.