



Discussion Paper

“TARIFF FRAMEWORK FOR PROCUREMENT OF POWER BY THE DISTRIBUTION LICENSEES AND OTHERS FROM WIND –SOLAR AND STORAGE IF ANY, HYBRID POWER PROJECTS FOR THE STATE OF GUJARAT”

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INTRODUCTION

The Gujarat Electricity Regulatory Commission (GERC or Commission) had issued first Tariff Order being Order No. 04 of 2021 on 3rd April 2021 specifying the tariff framework for Procurement of Power by Distribution Licensees and Others from Wind-Solar Hybrid Energy Projects and Other Commercial issues for the State of Gujarat. The control period of the said Order was up to March 31, 2023.

The Commission has discontinued the 'generic tariff' determination regime for procurement of power from Wind /solar power projects in the State. Similar approach had been followed for procurement of power from Wind-Solar Hybrid Projects in the State during the last control period (2021-2023) of previous tariff Order No. 4 of 2021 wherein the Commission mandated the distribution licensees to procure power from Wind-Solar Hybrid Power Projects through Competitive Bidding under Section 63 of the Electricity Act, 2003 and as per guidelines prepared by the Government of India.

The Commission intends to provide clarity on the tariff framework for the prospective period, for procurement of power generated by the Wind-Solar Hybrid Power Projects in the State of Gujarat by Distribution Licensees, under the powers conferred to it under Sections 61(h), 62(1) (a), and 86(1) (b) & (e) of the Electricity Act, 2003, and National Electricity Policy, 2005, and Tariff Policy, 2016.

The Commission presents this Discussion Paper as part of the regulatory process for providing tariff framework for procurement of power by distribution licensees and other from the Wind-Solar Hybrid Power Projects in the State for prospective period based on comments received from Stakeholders on this Discussion Paper.



Executive Summary

Subsequent to the Notification of Gujarat Wind-Solar Hybrid Power Policy 2018 by Government of Gujarat and announcement of tariff based Competitive Bidding Guidelines for Procurement of Power from Grid connected Wind Solar Hybrid Power Projects by Ministry of New and Renewable Energy, Government of India, the Commission has notified first Tariff Order being Order No. 04 of 2021 on 3rd April 2021 specifying the Tariff Framework for Procurement of Power by Distribution Licensees and Others from Wind-Solar Hybrid Power Projects and Other Commercial issues for the State of Gujarat. The control period of the said Order was up to March 31, 2023. The Commission vide Order dated 17th March 2023 in Petition No. 2128 of 2022 has extended the control period of the Tariff Order No. 04 of 2021 up to 19th June 2023.

The Commission has discontinued the 'generic tariff' determination regime for Procurement of Power from Wind/Solar Power Projects and storage system, if any, in the State. Similar approach had been followed for Procurement of Power from Wind-Solar Hybrid Projects in the State with effect of issuance of previous Tariff Order No. 04 of 2021 wherein the Commission has mandated the distribution licensees to procure power from Wind-Solar Hybrid Power Projects through Competitive Bidding under Section 63 of the Act as per guidelines notified by the Government of India.

The State of Gujarat is blessed with ample Wind and Solar resource. Solar and Wind resource complement each other in terms of generation profile. The Commission is recognised the importance of encouraging the development of Wind –Solar Hybrid Projects in the State in view of optimum utilization of land and transmission asset as well as aiming for obtaining firm power with and without storage.

In view of above, the Commission proposes to determine the tariff for all prospective Wind-Solar and Storage, if any, Hybrid Power Projects Type A (Existing projects) and Type B (New Projects)) to be commissioned during the next control period, based on the rates discovered through Competitive Bidding under Section 63 of the Electricity Act, 2003 or by following Competitive Bidding Process followed by SECI/MNRE etc.

Further, there could be cases of Wind-Solar and Storage system, if any, Hybrid power projects below the threshold limit of eligibility (< 50 MW) for participating in Competitive



Bidding. It is proposed that the tariff for such projects shall be considered equal to the tariff discovered through Competitive Bidding by State owned DISCOMs, indifferent time period of 6 months of the year as under:

For Type – A (Existing projects):

The purchase of power from existing wind/solar capacity shall be in accordance with the respective PPAs with Distribution licensees. The purchase of power from additional /new capacity shall be at the weighted average tariff (for respective RE addition capacity i.e. Wind or Solar), available as on 1stApril (as discovered in the Competitive Bidding by GUVNL during previous six months October- March and adopted by the Commission) shall be applicable for the projects to be commissioned under PPAs signed during April-September. Similarly, the weighted average tariff (for respective RE addition capacity i.e. Wind or Solar and Storage capacity, if any), available as on 1st October (as discovered in the Competitive Bidding by GUVNL during previous six months April-September and adopted by the Commission) shall be applicable for the projects to be commissioned under PPAs signed during October-March.

For Type-B (New Projects):

The purchase of power from such projects shall be at the weighted average tariff (of Wind, Solar & Wind-Solar and Storage capacity Hybrid), available as on 1st April (as discovered in the Competitive Bidding by GUVNL during previous six months October-March and adopted by the Commission) shall be applicable for the projects to be commissioned under PPAs signed during April-September. Similarly, the weighted average tariff (of Wind, Solar & Wind-Solar and Storage capacity, if any Hybrid), available as on 1st October (as discovered in the Competitive Bidding by GUVNL during previous six months April-September and adopted by the Commission) shall be applicable for the projects to be commissioned under PPAs signed during October-March.

In case weighted average tariff is not available for particular 6 months' period then latest weighted average tariff available for 6 months' period as discussed above shall be considered.

The distribution licensees shall place on its website the applicable tariff on which it will purchase the energy generated from such Wind Solar and Storage capacity, Hybrid Power Projects. The rate will be updated every 6 months.



Key proposals under the discussion paper

- The Commission proposes to determine the tariff for Type A (Existing projects) as well as Type B (New projects) based on the rates discovered through competitive bidding route as per Section 63 of the Electricity Act, 2003.
- The power procurement from Wind-Solar and Storage, if any Hybrid Projects proposed to be used for fulfilment of Solar RPO and Non-Solar RPO in the proportion of rated capacity of Solar and Wind power in the plant respectively.
- The choice of capacity mix between Wind and Solar and Storage, if any shall be the discretion of the Developer or as per the individual schemes as notified by the State or Central Government from time to time. However, at the locations of having good wind power potential, the Solar PV capacity to be added as the Solar-Hybrid component could be relatively smaller. Similarly, in case of the sites where the Wind Power Density (WPD) is relatively lower or moderate, the component of the Solar PV capacity could be relatively on a higher side. The ratio of different technology mix of Wind-Solar and Storage if any, percentage as a part of Hybrid Project shall be in accordance with the Notification of MNRE in this regard.
- Forecasting and Scheduling of power from Wind Solar Hybrid and Storage capacity, if any, shall be governed by the provisions under GERC (Forecasting, Scheduling, Deviation Settlement and Related Matters of Wind and Solar Generation Sources) Regulations, 2019 and its amendments issued from time to time.

Other Commercial issues

Wheeling of Electricity

- The payment of transmission charges shall be applicable on sanctioned/allocated transmission capacity at the rate as applicable to any normal Open Access Consumer.
- Transmission losses shall be applicable on energy feed-basis as applicable to any other Wind or Solar Project.
- **For captive use and third party sale:** In case of injection at 66 KV and drawl at 11 KV voltage level, wheeling of electricity generated from the Hybrid Project to desired location(s) within the State shall be allowed on payment of transmission



charges and transmission losses as stated above and wheeling charges and distribution losses, as applicable to normal Open Access consumers, and as amended by GERC from time to time.

- Set-off of wheeled energy at recipients' end shall be carried out in the same 15-minute time block. Further, Cross Subsidy Surcharge and Additional Surcharge, as applicable to normal Open Access Consumers, shall be applicable.
- Hybrid Project Developers, who desire to wheel electricity to more than one location for captive use/third-party sale, shall pay 5 paise per unit on energy fed in the grid to the concerned DISCOMs in whose area power is consumed in addition to above mentioned transmission charges and losses, as applicable.
- In case, total injection of power from the Hybrid Project exceeds such allocated/sanctioned transmission capacity, such power shall be considered as inadvertent flow of power and shall not be considered for any commercial settlement.

Banking of Surplus Energy

- The Commission endeavor to proposed that the banking facility to Wind Solar Hybrid Power Projects set up under OA regime for captive transaction or third party transaction whatever the case may be. The settlement of energy in case of non-REC open access projects i.e. those projects wherein the consumers does not take renewable attribute shall be allowed on monthly basis during the billing cycle. The settlement of energy shall be on peak and off peak hours basis. As per Green Energy Open Access Rules 2022, notified by Ministry of Power, banking is permitted on billing cycle basis on payment of charges to compensate additional cost, if any, to the distribution licensee. Banking charges will be applicable as specified in Green Energy Open Access Rules 2022 notified by MoP, Government of India read with GERC Green Energy Open Access Regulations and as amended made therein from time to time.

Projects under REC Mechanism



- Hybrid Projects availing open access for captive use/third-party sale under REC mechanism shall be governed as per CERC REC Regulations.
- Such projects shall be allowed to transit and/or wheel the electricity on payment of applicable transmission charges and losses, wheeling charges and losses and other charges as applicable to other normal Open Access Consumers.
- Cross Subsidy Surcharge and Additional Surcharge shall be applicable as applicable to normal Open Access Consumers.
- No banking facility available to energy generated from such project.

Forecasting and Scheduling

Hybrid Projects shall require to follow the provisions as prescribed under the GERC (Forecasting & Scheduling, Deviation Settlement and Related Matters of Solar and Wind Generation Sources) Regulations, 2019 notified on 19th January, 2019 and its amendments issued from time to time.

Wind- Solar Hybrid System & Power Evacuation:

Type-A Projects (Existing Projects):

Existing Wind Power or Solar Power Projects Developers, willing to install Solar PV Plant or Wind Turbine Generators and/or storage, if any, respectively, at the existing location, shall be allowed to do so with following conditions:

- i. The total power injection (combined wind and solar) into the grid shall not be more than the transmission capacity/grid connectivity allowed/sanctioned by GETCO for this purpose. In case, addition/augmentation in the existing evacuation system is required as per the system study undertaken by GETCO due to addition of wind/solar and/or storage capacity, Developers shall undertake such addition/augmentation in the system up to the receiving end sub-station of GETCO at their own cost. However, the primary focus is to optimize the utilization of existing transmission infrastructure and technologies, and design approaches towards minimum augmentation is encouraged.
- ii. The additional solar/wind power and storage, if any, from the Hybrid Project shall be allowed to wheel for captive use or for sale of power to a third-party or sale to



DISCOMs. For transmission and wheeling of power, the applicable charges and losses shall be as specified in this Order.

- iii. In case the developer intends to convert existing Solar/Wind project into hybrid power by adding new solar/wind capacity for the purpose of captive use or third party sale, the developer has to (i) registered the project afresh with GEDA, (ii) need to execute the fresh transmission and wheeling agreement with GETCO / distribution licensee and (iii) shall pay the OA charges & losses and banking facility and charges as specified in this discussion paper.

Conversion of existing wind /solar project which presently are tied up with GUVNL/DISCOM under long term PPA on preferential tariff are allowed to be converted into hybrid with mutual consent. The tariff for newly converted hybrid projects shall be determined by the Commission under Section 63 of the Act as proposed in this discussion paper.

- iv. The Developers shall approach GETCO for determining the transmission capacity available to evacuate the additional wind/ solar power or any augmentation that maybe required. GETCO shall provide the relevant data with regards to the transmission capacity utilization on its existing network.

2. Type-B Projects (New Projects)

- i. The Developers of Hybrid Projects shall establish the evacuation line at their own cost up to the receiving end sub-station of GETCO.
- ii. The Developer has option for transmission and/or wheeling of wind and solar power for their captive use or third-party sale or sale of power to the DISCOMs. For transmission and wheeling of power, the applicable charges and losses and benefits of banking and charges on it, shall be as specified in this Order.
- iii. Hybrid Project Developer shall approach GETCO for evacuation system planning up to the receiving station.

CDM Benefits

It is proposed that the sharing of CDM benefits or any other benefit such as Carbon Credit etc. or any other benefits under CDM or any other mechanism under any provision from any source providing such benefits to the Solar –Wind Hybrid Power Project for which it



shall qualify to receive such benefit may apply to the concerned authority to avail / receive the benefit for the project. The benefits which shall be receivable or received shall be shared with the procurer of power and / or licensee as under:

- (i) 100% of the gross proceeds on account of such CDM benefit or any other benefit under CDM from any source to be retained by the project Developer in the first year after the date of commercial operation of the generating station.
- (ii) In the second year, the share of the Beneficiaries like power procurer/licensee shall be 10% which shall be progressively increased by 10% every year till it reaches 50%, where after the proceeds shall be shared in equal proportion, by the Generating Company and the Beneficiaries like power procurer/licensee.”
- (iii) In case of PPA signed under competitive bidding process, the sharing of benefits received by the Hybrid project shall be as per terms and conditions of bid documents read with the PPA.

Security Deposit

- i. The Hybrid Power Developer setting up project (Type-B) shall be required to provide Bank Guarantee @ Rs. 15 lakhs per MW to GETCO based on allotment of transmission capacity and in case the Developer fails to commission the Hybrid capacity within the time period mentioned hereunder, GETCO shall encash the Bank Guarantee.



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Abbreviations

%	Percentage
ABT	Availability-Based Tariff
AC	Alternating Current
AREPGL	Adani Renewable Energy Park Limited
AEML	Adani Electricity Mumbai Ltd.
APPC	Average Pooled Purchase Cost
BOO	Build, Own and Operate
CBG	Competitive Bidding Guidelines
CDM	Clean Development Mechanism
CEA	Central Electricity Authority
CER	Certified Emission Reduction
CERC	Central Electricity Regulatory Commission
COD	Date of Commercial Operation
CPSU	Central Public Sector Undertaking
CUF	Capacity Utilization Factor
DISCOM	Distribution Companies
DC	Direct Current
EA	Electricity Act, 2003
FY	Financial Year
GEDA	Gujarat Energy Development Agency
GERC	Gujarat Electricity Regulatory Commission
GETCO	Gujarat Energy Transmission Corporation Ltd.
GoG	Government of Gujarat
GoI	Government of India
GUVNL	Gujarat Urja Vikas Nigam Limited
HPD	Hybrid Project Developer
HPG	Hybrid Project Generator
HPP	Hybrid Power Project



HPPC	Haryana Power Purchase Centre
IPCL	India Power Corporation Limited
IREDA	Indian Renewable Energy Development Agency
ISTS	Inter-State Transmission System
JNNSM	Jawaharlal Nehru National Solar Mission
KV	Kilo Volt
kW	Kilo Watt
kWh	Kilo Watt hours
kVARh	Kilo Volt Ampere Reactive Hour
M	Meter
m/s	meter per second
MERC	Maharashtra Electricity Regulatory Commission
MNRE	Ministry of New and Renewable Energy
MW	Mega Watt
MWh	Mega Watt hour
NEP	National Electricity Policy
NTP	National Tariff Policy
O&M	Operation and Maintenance
PPA	Power Purchase Agreement
PSA	Power Supply Agreement
PSPCL	Punjab State Power Corporation Limited
PV	Photovoltaic
R&D	Research & Development
RE	Renewable Energy
REC	Renewable Energy Certificate
RfS	Request for Selection
RPO	Renewable Purchase Obligation
RPS	Renewable Purchase Standards
₹	Rupee



RTC	Round the Clock
SECI	Solar Energy Corporation of India
SERC	State Electricity Regulatory Commission
T&D	Transmission & Distribution
TPC-D	Tata Power Company Ltd – Distribution
V	Volt
WPD	Wind Power Density
WTG	Wind Turbine Generators





Chapter 1: Introduction

1.1 Background

In exercise of the powers conferred under Sections 3 (1), 61 (h), 62 (1) (a), and 86 (1) (b) & (e) of the Electricity Act, 2003, National Electricity Policy, 2005, and Tariff Policy, 2016 and all other powers enabling it in this behalf, the Gujarat Electricity Regulatory Commission (GERC or Commission) presents this Discussion Paper on the tariff framework for procurement of power by Distribution Licensees and others from Wind – Solar Hybrid Power Projects to be commissioned prospectively. The Commission issued Order No. 04 of 2021 dated 03rd April 2021 for tariff framework for Procurement of Power by Distribution Licensees and Others from Wind-Solar Hybrid Energy Projects and Other Commercial issues for the State of Gujarat. The control period of the said order was up to March 31, 2023. The Commission vide Order dated 17th March 2023 in Petition No. 2128 of 2022 has extended the control period of the Tariff Order No. 04 of 2021 up to 19th June 2023.

The tariff framework proposed in the discussion paper is based on the broad principles contained under the (i) Gujarat Wind-Solar Hybrid Power Policy, 2018 (ii) National Wind-Solar Hybrid Policy, 2018 (iii) GERC (Multi Year Tariff) Regulations, 2016, (ii) GERC (Procurement of Energy from Renewable Sources) Regulations, 2010 and its subsequent amendments (iii) CERC (Terms and Conditions for Tariff Determination from Renewable Energy Sources) Regulations, 2020, and (iv) Green Energy Open Access Rules 2022 notified by the Ministry of Power, Government of India.

1.2 The Electricity Act, 2003

The following provisions of the Act provide the enabling legal framework for promotion of the Renewable Sources of energy by the State Electricity Regulatory Commissions (SERCs):

Section 86 (1) (e) of the Electricity Act 2003 mandates promotion of cogeneration and generation of electricity from renewable sources of energy:

“Promote cogeneration and generation of electricity from renewable sources of energy by providing suitable measures for connectivity with the grid and sale of electricity to



any person, and also specify, for purchase of electricity from such sources, a percentage of the total consumption of electricity in the area of a distribution license.”

Section 61 (h) of the Act provides that, while specifying the terms and conditions of determination of tariff, the Commission shall be guided by the objective of promotion of cogeneration and generation of electricity from renewable sources of energy.

“The promotion of cogeneration and generation of electricity from renewable sources of energy.”

Both these Sections i.e., Section 86(1)(e) and Section 61(h) are mandatory in nature and therefore put significant responsibility on the Regulators with regard to promotion of renewable in respective states.

Section 62 (1) (a) of the Act provides for determination of tariff for supply of electricity by a generating company to a distribution licensee.

“Supply of electricity by a generating company to a distribution licensee: Provided that the Appropriate Commission may, in case of shortage of supply of electricity, fix the minimum and maximum ceiling of tariff for sale or purchase of electricity in pursuance of an agreement, entered into between a generating company and a licensee or between licensees, for a period not exceeding one year to ensure reasonable prices of electricity.”

While determining the generation tariff for RE sources under Section 62 (1) (a) read with Section 61 (h), the SERCs are supposed to be guided by the promotional aspect of RE sources.

Section 3 (1) of the Electricity Act 2003 requires the Central Government to formulate, *inter alia*, the National Electricity Policy in consultation with the Central Electricity Authority (CEA) and State Governments. The provision is quoted below:

“The Central Government shall, from time to time, prepare the National Electricity Policy and tariff policy, in consultation with the State Governments and the Authority for development of the power system based on optimal utilization of resources such as coal, natural gas, nuclear substances or materials, hydro and renewable sources of energy.”



1.3 Electricity (Promoting Renewable Energy Through Green Energy Open Access) Rules, 2022

The Electricity (Promoting Renewable Energy Through Green Energy Open Access) Rules, 2022 were notified on 6th June 2022 with amendments dated 27th January, 2023 & 13.05.2023 to facilitate use of Renewable Energy (RE) by the consumers and to further accelerate India's RE programs. The aforesaid Rule provides that the tariff for the supply of green energy shall be determined separately by the Appropriate Commission based on the Average Pooled Power Purchase Cost of the renewable energy, cross-subsidy charges (if any), and service charges covering the prudent cost of the distribution licensee for providing the green energy.

1.4 National Electricity Policy (NEP)

Clause 5.2.20 of the NEP stipulates the need for fully exploiting the feasible potential of non-conventional energy sources, as reproduced below:

“5.2.20 Feasible potential of non-conventional energy resources, mainly small hydro, wind and biomass would also need to be exploited fully to create additional power generation capacity. With a view to increase the overall share of non-conventional energy sources in the electricity mix, efforts will be made to encourage private sector participation through suitable promotional measures.”

Clause 5.6.1 stipulates about the need for Technology Development and R&D on non-conventional energy systems, as reproduced below:

“Special efforts would be made for research, development demonstration and commercialisation of non-conventional energy systems. Such systems would need to meet international standards, specifications and performance parameters.”

Clause **5.12** of the National Electricity Policy stipulates several conditions for promotion and harnessing of renewable energy sources. The salient features of the said provisions of NEP are reproduced below.

“5.12.1: Non-conventional sources of energy being the most environment-friendly, there is an urgent need to promote generation of electricity based on such sources of energy. For this purpose, efforts need to be made to reduce the capital cost of projects based on non-conventional and renewable sources of energy. Cost of energy can also be reduced by promoting competition within such projects. At the same time, adequate



promotional measures would also have to be taken for development of technologies and a sustained growth of these sources.

1.5 Tariff Policy 2016

In compliance with the Section (3) of the Act, the Central Government has notified the revised Tariff Policy on 28th January, 2016. The Tariff Policy elaborates the role of Regulatory Commissions, the mechanism for promoting renewable energy, the time-frame for implementation, etc. Clause 5.2 of the Tariff Policy provides as under:

“Provided also that the State Government can notify a policy to encourage investment in the State by allowing setting up of generating plants, including from renewable energy sources out of which a maximum of 35% of the installed capacity can be procured by the Distribution Licensees of that State for which the tariff may be determined under Section 62 of the Electricity Act, 2003.”

Clause 6.4 of the Tariff Policy addresses various aspects associated with promoting and harnessing renewable sources of energy generation including co-generation from renewable energy sources, as reproduced below:

1) *“Pursuant to provisions of Section 86(1)(e) of the Act, the Appropriate Commission shall fix a minimum percentage of the total consumption of electricity in the area of a distribution licensee for purchase of energy from renewable energy sources, taking into account availability of such resources and its impact on retail tariffs. Cost of purchase of renewable energy shall be taken into account while determining tariff by SERCs. Long term growth trajectory of Renewable Purchase Obligations (RPOs) will be prescribed by the Ministry of Power in consultation with MNRE.*

Provided that cogeneration from sources other than renewable sources shall not be excluded from the applicability of RPOs.

(i) Within the percentage so made applicable, to start with, the SERCs shall also reserve a minimum percentage for purchase of solar energy from the date of notification of this policy which shall be such that it reaches 8% of total consumption of energy, excluding Hydro Power, by March 2022 or as notified by the Central Government from time to time.



(ii) Distribution Licensee(s) shall compulsorily procure 100% power produced from all the Waste-to-Energy plants in the State, in the ratio of their procurement of power from all sources including their own, at the tariff determined by the Appropriate Commission under Section 62 of the Act.

(iii) It is desirable that purchase of energy from renewable sources of energy takes place more or less in the same proportion in different States. To achieve this objective in the current scenario of large availability of such resources only in certain parts of the country, an appropriate mechanism such as Renewable Energy Certificate (REC) would need to be promoted. Through such a mechanism, the renewable energy based generation companies can sell the electricity to local distribution licensee at the rates for conventional power and can recover the balance cost by selling certificates to other distribution companies and obligated entities enabling the latter to meet their Renewable Power Purchase Obligations. The REC mechanism should also have a solar specific REC.

(iv) Appropriate Commission may also provide for a suitable regulatory framework for encouraging such other emerging renewable energy technologies by prescribing separate technology based REC multiplier (i.e. granting higher or lower number of RECs to such emerging technologies for the same level of generation). Similarly, considering the change in prices of renewable energy technologies with passage of time, the Appropriate Commission may prescribe vintage based REC multiplier (i.e. granting higher or lower number of RECs for the same level of generation based on year of commissioning of plant).

2) States shall endeavour to procure power from renewable energy sources through competitive bidding to keep the tariff low, except from the waste to energy plants. Procurement of Power by Distribution Licensee from renewable energy sources from projects above the notified capacity, shall be done through competitive bidding process, from the date to be notified by the Central Government.

However, till such notification, any such procurement of power from renewable energy sources projects, may be done under Section 62 of the Electricity Act, 2003. While determining the tariff from such sources, the Appropriate Commission shall take into account the solar radiation and wind intensity which may differ from area to area to ensure that the benefits are passed on to the consumers.



3) *The Central Commission should lay down guidelines for pricing intermittent power, especially from renewable energy sources, where such procurement is not through competitive bidding. The tariff stipulated by CERC shall act as a ceiling for that category.*

4) *In order to incentivize the Distribution Companies to procure power from renewable sources of energy, the Central Government may notify, from time to time, an appropriate bid-based tariff framework for renewable energy, allowing the tariff to be increased progressively in a back-loaded or any other manner in the public interest during the period of PPA, over the life cycle of such a generating plant. Correspondingly, the procurer of such bid-based renewable energy shall comply with the obligations for payment of tariff so determined.*

5) *In order to promote renewable energy sources, any generating company proposing to establish a coal/lignite based thermal generating station after a specified date shall be required to establish such renewable energy generating capacity or procure and supply renewable energy equivalent to such capacity, as may be prescribed by the Central Government from time to time after due consultation with stakeholders. The renewable energy produced by each generator may be bundled with its thermal generation for the purpose of sale. In case an obligated entity procures this renewable power, then the SERCs will consider the obligated entity to have met the Renewable Purchase Obligation (RPO) to the extent of power bought from such renewable energy generating stations.*

Provided further that in case any existing coal and lignite based thermal power generating station, with the concurrence of power procurers under the existing Power Purchase Agreements, chooses to set up additional renewable energy generating capacity, the power from such plant shall be allowed to be bundled and tariff of such renewable energy shall be allowed to be pass through by the Appropriate Commission. The Obligated Entities who finally buy such power shall account towards their Renewable Purchase Obligations.

Provided also that scheduling and despatch of such conventional and renewable generating plants shall be done separately.

6) *In order to further encourage renewable sources of energy, no inter-State transmission charges and losses may be levied till such period as may be notified by the*



Central Government on transmission of the electricity generated from solar and wind sources of energy through the inter-State transmission system for sale.

7) Appropriate Commission may provide regulatory framework to facilitate generation and sale of electricity from renewable energy sources particularly from roof-top solar system by any entity including local authority, Panchayat Institution, user institution, cooperative society, Non-Governmental Organization, franchisee or by Renewable Energy Service Company. The Appropriate Government may also provide complementary policy support for this purpose.”

1.6 National Wind- Solar Hybrid Power Policy 2018

The Ministry of New and Renewable Energy (MNRE) issued the National Wind-Solar Hybrid Policy on 14th May 2018.

“2.1 The main objective of the policy is to provide a framework for promotion of large grid connected wind-solar PV hybrid system for efficient utilization of transmission infrastructure and land. It also aims at reducing the variability in renewable power generation and achieving better grid stability.

2.2 Policy also aims to encourage new technologies, methods and way-outs involving combined operation of wind and solar PV Plants.”

The policy seeks to provide support for new hybrid projects as well as hybridisation of existing wind/solar power projects. The policy also permits use of battery storage in the hybrid project for optimising the output and further reduce the variability.

The Policy state that a wind-solar plant will be recognized as hybrid plant if the rated power capacity of one resource is at least 25% of the rated power capacity of other resource.

The Policy also state that the Central Electricity Authority and CERC shall formulate necessary standards and regulations including metering methodology and standards, forecasting and scheduling regulations, REC mechanism, grant of connectivity and sharing of transmission lines, etc. for wind-solar hybrid systems.



1.7 MNRE Guidelines for Tariff Based Competitive Bidding Process for Procurement of Power from Grid Connected Wind Solar Hybrid Projects (No.238/78/2017-Wind dated 14.10.2020)

The specific objective of these guidelines as follows:

- a) To promote competitive procurement of electricity from grid connected Wind Solar Hybrid Power Projects (hereafter termed as 'Hybrid Power Project'), by distribution licensees, to protect consumers' interests;
- b) To facilitate transparency and fairness in procurement processes / and to provide for a framework for an Intermediary Procurer as an Aggregator / trader for the inter-state sale purchase of long-term power.
- c) To provide a risk-sharing framework between various stakeholders, involved in the wind solar hybrid power procurement, thereby encouraging investments, enhanced bankability of the Projects and profitability for the investors.

Applicability of Guidelines

“3.1 These Guidelines are being issued under the provisions of Section 63 of the Electricity Act, 2003 for long-term procurement of electricity through competitive bidding process, by Procurer(s), from Hybrid Power Projects having individual size of 50 MW and above at one site with minimum bid capacity of 50 MW, subject to the condition that the rated power capacity of one resource (wind or solar) shall be at least 33% of the total contracted capacity.

3.2. The solar and wind projects of the hybrid project may be located at same or different locations. The minimum capacity to be injected at each injection point shall be 50 MW.

3.3. Storage may be added to the hybrid power project:

- a. to reduce the variability of output power from wind solar hybrid project;
- b. providing higher energy output for a given capacity (bid/ sanctioned capacity) at delivery point, by installing additional capacity of wind and solar power in a wind solar hybrid project;
- c. to ensure availability of firm power for a particular period.



3.4. Unless explicitly specified in these Guidelines, the provisions of these Guidelines shall be binding on the Procurer and Intermediary Procurer. The process to be adopted in event of any deviation proposed from these Guidelines is specified in Clause 23 of these Guidelines.

3.5. The power procured from the project may be used for fulfilment of solar and non-solar RPO in the proportion of rated capacity of solar and wind power in the plant respectively.”

The arrangement for implementation shall be as under:

- a) SECI will be the nodal agency for implementation of these Guidelines.
- b) The selection of the Hybrid Power Projects will be through a transparent e-bidding process followed by e-reverse auction.
- c) The solar and wind projects may be located at same or different locations.
- d) Storage may be added to the Hybrid power project.
- e) The power procured from the project may be used for fulfilment of solar RPO and non-solar RPO in the proportion of rated capacity of solar and wind power in the plant respectively.
- f) Unless explicitly specified in these Guidelines, the provisions of these Guidelines shall be binding on the Procurer and SECI.
- g) The Intermediary Procurer, i.e., SECI, shall enter into a Power Purchase Agreement (PPA) with the Hybrid Power Generator(s) and also enter into a Power Sale Agreement (PSA) with the distribution licensee(s) /consumer(s). The PSA shall contain the relevant provisions of the PPA on a back-to-back basis. In case SECI is not able to enter into a PSA to sell power from projects awarded to distribution licensee(s) or bulk consumers within six months from issue of letter of award, those projects would be cancelled.
- h) The duration of the PPA period should not be less than 25 years from the Scheduled Commissioning Date (SCD).
- i) SECI may charge a trading margin of seven paise/kWh from the Buying entity / Procurer for purchase and sale of the hybrid power.



j) The bidders may avail fiscal and financial incentives available for such projects as per prevailing conditions and Rules, and the same may be disclosed by the SECI in the Request for Selection (RfS) document

1.8 Gujarat Wind-Solar Hybrid Power Policy 2018

“Gujarat Wind-Solar Hybrid Power policy-2018” notified by Govt. of Gujarat on 20th June 2018 aims to harness the huge RE potential of the State through “hybridization” of the two sources of energy. Solar and Wind energy potential of the State is mostly concentrated in the areas of Saurashtra, Kutch and North Gujarat region.

The main objectives of the Policy are:

“1. To provide a framework for promotion of large grid-connected Wind-Solar PV Hybrid Systems for optimal and efficient utilization of the transmission infrastructure and land, and reducing the variability in renewable power generation thus achieving better grid-stability.

2. To encourage new technologies, methods and solutions to facilitate the combined operation of wind and solar PV plants and to promote the integration with emerging technologies like energy storage systems.”

The effective operational period of the policy was for 5 years starting from the date of issuance i.e. up to May 2023.

The tariff related suggestions outlined in the above policy is elaborated below:

.8. TARIFF FOR SALE TO DISCOMS

Distribution Licensees may purchase power from Hybrid Projects, wind and solar separately as follows for meeting their RPOs.

8.1 In case of Type –A project (Existing projects)

The purchase of power from existing project shall be according to respective PPA. Whereas the sale and purchase of power from additional /new capacity shall be at the tariff discovered through competitive bidding undertaken by DISCOMs separately for Wind and Solar power purchase.

8.2. In case of Type-B Projects (New Projects)



The purchase of wind/solar power shall be at a tariff discovered through competitive bidding (reverse bidding whenever required) undertaken by DISCOMs separately for Wind and Solar Power Purchase until a common tariff mechanism and RPO for the hybrid project is evolved.

1.9 Renewable Purchase Obligation (RPO) in Gujarat

The Gujarat Electricity Regulatory Commission (Procurement of Energy from Renewable Sources) (Third Amendment) Regulations, 2022, (Notification No. 02 of 2022) dated 31st May, 2022 has specified the minimum Renewable Power Purchase target by the obligated entities for the FY 2017-18 to FY 2024-25 as shown in Table No. 1.1 below.

As per the RPO Regulation, the obligated entities have the obligation to purchase electricity (in kWh) from specified RE sources. The said purchase shall be at a defined minimum percentage of the total consumption of its consumers including T&D losses during a year.

This renewable purchase obligation applies to:

- distribution licensees; and
- any other captive and open-access users consuming electricity (i) generated from conventional captive generating plant having capacity of 5 MW and above for their own use and/or (ii) procured from conventional generation through open access and third party sale.

Table 1: Renewable purchase obligation in Gujarat for FY 2017-18 to FY 2024-25

Financial Year	Total RPO	Non-Solar RPO		Solar RPO	Hydro
		Wind	Biomass bagasse and other	Solar	Hydro Power
2017-18	10.00%	7.75%	0.50%	1.75%	
2018-19	12.70%	7.95%	0.50%	4.25%	
2019-20	14.30%	8.05%	0.75%	5.50%	
2020-21	15.65%	8.15%	0.75%	6.75%	
2021-22	17.00%	8.25%	0.75%	8.00%	
2022-23	17%	8.25%	0.75%	8.00%	
2023-24	18.70%	8.40%	0.75%	9.50%	0.05%



Financial Year	Total RPO	Non-Solar RPO		Solar RPO	Hydro
		Wind	Biomass bagasse and other	Solar	Hydro Power
2024-25	20.70%	8.55%	0.8%	11.25%	0.1%

Source: GERC (Procurement of Energy from Renewable Sources) (Third Amendment) Regulations, 2022

Further, the aforesaid Regulation recognises the certificates issued within the scope of Central Electricity Regulatory Commission's (CERC) Notification No. L-1/12/2010-CERC dated 14th January 2010 as the valid instruments for the discharge of the mandatory obligations set out in these Regulations for the obligated entities to purchase electricity from Renewable Energy Sources termed as Renewable Energy Certificates (REC).

End of Chapter 1



Chapter 2: Study of Competitive Bidding Results for Wind Solar Hybrid

2.1 Introduction

Solar Energy Corporation of India (SECI) has been playing the key role of a nodal agency for conducting e-reverse auction for procurement for power for solar and wind projects. SECI has also published tender for supply of round the clock (RTC) power, peak power as well as power procurement from Wind –Solar Hybrid projects as per guidelines issued by MNRE.

The tariff discovered during the control period of present tariff order (2021-2023) under the Inter-State Transmission System connected (ISTS) Wind Solar Hybrid Project tender floated by SECI as well wind solar hybrid tariff, the discovery rates under the State specific bidding conducted by State level entities is discussed in the following section.

2.2 SECI Wind-Solar Hybrid Power Projects (Tranche-III)

In January 2020, SECI had issued a Request for Selection (RfS) for setting up of 1200 MW ISTS-connected Wind-Solar Hybrid power projects in India (Tranche-III). The tender received a total of 3310 MW of bids, being oversubscribed by 2110 MW. The L1 tariff of ₹2.41/kWh was quoted by Adani Renewable Energy (600 MW), ABC Renewable Energy (380 MW), Amp Energy Green (130 MW). Acme Solar made the L2 price mark at ₹2.42/kWh for 300 MW capacity, but was allotted 90 MW under the bucket-filling method. Players such as Adani and ReNew Power have been frequent participants in the previous WSH tenders. Whereas, Acme Solar, NLC (Neyveli Lignite Corporation), Sembcorp (Green Infra) are the new players that have participated and shown keen interest to bid in a WSH tender for the first time.

Table 2:Tariff Discovered in SECI hybrid Tender (Tranche – III)

Sr. No.	Name of the Project	Capacity (in MW)	Tariff (₹/kWh)
1	ABE Renewable Energy Private Limited	380	2.41
2	Adani Renewable Energy Holding Eight Limited	600	2.41
3	AMP Energy Green	130	2.41



	Private Limited		
4	ACME Solar Holding Private Limited	300	2.42

2.3 SECI Wind-Solar Hybrid Power Projects (Tranche-IV)

In April 2021, SECI had issued a Request for Selection (RfS) for setting up of 1200 MW ISTS-connected Wind-Solar Hybrid power projects in India (Tranche-IV). The tender received a total of 6280 MW of bids, being oversubscribed by 5080 MW. The L1 tariff of ₹2.34/kWh was quoted by NTPC Limited (450 MW), NLC Limited (150 MW), Project Ten Renewable Energy Limited (450 MW). Azure Power India Limited made the L2 price mark at ₹2.35/kWh for 150 MW capacity.

Table 3: Tariff Discovered in SECI hybrid Tender (Tranche – IV)

Sr. No.	Name of the Project	Capacity (in MW)	Tariff (₹/kWh)
1	NTPC Limited.	450	2.34
2	NLC India Limited	150	2.34
3	Project Ten Renewable Power Private Limited	450	2.34
4	Azure Power India Limited	300	2.35

2.4 SECI Wind-Solar Hybrid Power Projects (Tranche-V)

SECI had floated the tender to set up 1,200 MW ISTS-connected Wind-Solar Hybrid Projects in October 2021. According to the tender document, the hybrid power projects had to be designed for inter-connection with the transmission network of the central transmission utility at the voltage level of 220 kV or above. Tata Power won a capacity of 600 MW, NTPC (450 MW), and Amp Energy (120 MW), each quoting ₹2.53/kWh. SJVN quoted ₹2.54/kWh for 200 MW but was only awarded 30 MW under the bucket filling method.

Table 4: Tariff Discovered in SECI hybrid Tender (Tranche – V)

Sr. No.	Name of the Project	Capacity (in MW)	Tariff (₹/kWh)
1	Tata Power Saurya Limited	600	2.53



2	AMP Energy Green Private Limited	120	2.53
3	NTPC Renewable Energy Limited	450	2.53

2.5 Maharashtra Wind – Solar Hybrid Tender

Tender floated by Tata Power –Distribution Company Limited (TPC – D)

TPC-D initiated competitive bidding process on 20th June 2020 for power procurement from Grid Connected 225 MW Wind-Solar Hybrid power project on long term basis to meet its RPO. The tariff was discovered through Tariff based Competitive Bidding Process and adopted by the Maharashtra Electricity Regulatory Commission vide Order No. 152 of 2020 dated 10.08.2020.

Table5: Tariff Discovered in bidding conducted by TPC –D

Sr. No.	Name of the Project	Capacity (in MW)	Tariff (₹/kWh)
1	Tata Power Green Energy Limited	225	2.59

Tender floated by Maharashtra State Electricity Distribution Co. Limited

MSEDCL initiated competitive bidding process on 07th May 2021 through BHARAT portal for procurement of 500 MW grid connected Wind-Solar Hybrid Power capacity on long term basis, to mitigate its solar as well as non-solar RPO.

The tender documents prepared by MSEDCL are consistent with the MNRE National Wind Solar Hybrid Policy dated 14th May 2018 and MNRE Guidelines dated 14th October 2020 for Tariff Based Competitive Bidding Process for Procurement of Power from Grid Connected Wind Solar Hybrid Projects.

Tariff which was discovered through Tariff based Competitive Bidding Process is shown in the following table.

Table 6: Tariff Discovered in bidding conducted by MSEDCL

Sr. No.	Name of the Project	Capacity (in MW)	Tariff (₹/kWh)
1	M/s T P Saurya Ltd	300	2.62



2	M/s Azure Power India Ltd	200	2.62
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MERC, however in its Order in Case No 15 of 2022 had rejected the above tariff as MSEDCL committed a delay of 5 months for approaching the Commission and SECI has discovered lower tariff than that of proposed by MSEDCL during same period.

2.6 Under Construction Hybrid Project (SECI):

Table 7: Summary of Under Construction Hybrid Project (CEA Report 31.10.2022)

Sr. No.	Scheme	Total Capacity Awarded (MW)	Under Construction Capacity (MW)
1	1200 MW ISTS-Connected Wind- Solar Hybrid Power Projects (Tranche-I)	840	450
2	1200 MW ISTS-Connected Wind- Solar Hybrid Power Projects (Tranche-III)	1110	1110
3	400MW ISTS-connected Round-the-clock (RTC) RE Power (RTC-1)	400	400
4	1200 MW ISTS-Connected RE Projects with assured Peak Power Supply in India (ISTS-VII)	1200	1200
5	1200MW ISTS-connected Wind Power Projects (Tranche-IV)	1050	1050
Total		4600	4210

2.7 Other Wind – Solar Hybrid Tenders floated in 2022 in India

1. PTC India floated a tender to procure 500 MW of Hybrid Renewable Energy (Tranche-I), with a green shoe option for an additional 500 MW, on a long-term basis for 25 years. PTC said that it planned to procure renewable power to the tune of 5,000 MW in the next 2-3 years in tranches of 500-1,000 MW each. The tender was floated to assess the market potential and procure power from interested hybrid renewable energy suppliers. At a later stage, based on the response, PTC may also sign a bilateral Power Purchase Agreement (PPA) with the most competitive source.
2. Rewa Ultra Mega Solar Limited (RUMSL), on behalf of Madhya Pradesh Power Management Company, issued a request for proposal for the development of 750 MW grid-connected Wind-Solar Hybrid Power Projects in Madhya Pradesh.



3. Tata Power Delhi Distribution (TPDDL) floated a tender to set up 255 MW of Wind-Solar Hybrid Power Projects with a green shoe option of an additional 255 MW across India. The projects were to be developed on a build, own, and operate basis. TPDDL will enter into a PPA with the successful bidders for 25 years from the scheduled commissioning date or from the date of full commissioning of the projects, whichever is earlier.
4. Maharashtra State Electricity Distribution Company (MSEDCL) floated tender for the procurement of 500 MW of Wind-Solar Hybrid Power on a long-term basis from grid-connected Intra-State Projects. MSEDCL would sign PPAs with the selected bidders to purchase Wind-Solar Hybrid Power for 25 years from the project's scheduled commercial operation date.
5. The above details states that the Competitive Bidding for discovery of tariff for Hybrid Projects has been adopted by SECI, distribution licensees and other in the Country and it seems that the discovered tariff is also attractive.

End of Chapter 2



CHAPTER 3: TARIFF FRAMEWORK, GENERAL PRINCIPLES AND OTHER COMMERCIAL CONSIDERATIONS

3.1 Tariff Framework:

- 3.1.1. The Ministry of New and Renewable Energy has notified competitive bidding guidelines for procurement of power from grid connected Wind Solar Hybrid Projects on 14.10.2020. The Commission has already directed the Distribution Licensees to procure power from Solar and Wind Projects through competitive bidding under Section 63 of the Act or by following competitive bidding process followed by SECI/MNRE etc.

The Commission has observed that, as per the provisions of the National Tariff Policy, procurement from renewable energy projects by distribution licensees is recommended through competitive bidding to keep the tariff low. Accordingly, the Govt. of India and various State Governments have initiated competitive bidding process for Procurement of Power from Wind and Solar Energy Projects, in which the discovered tariff for Solar and Wind Energy Projects has shown a substantial reduction.

- 3.1.2. The Commission during the control period of present Tariff Order No. 04 of 2021 (FY 2021-FY 2023) had recommended procurement of power generated from the existing project (Type A) as well new Wind Solar Hybrid Projects (Type B) as per the tariff discovered through competitive bidding through Section 63 of the Act. In case of small-scale projects which fall below the threshold limit provided in competitive bidding guidelines, the purchase of power from such projects shall be recommended based on the weighted average tariff (of Wind, Solar & Wind-Solar Hybrid) available as on 1st April or 1st October depending on the commissioning date of the project.
- 3.1.3. In view of the above, the Commission proposes to determine the tariff for the Type A (existing project) as well as all Type B (new wind solar hybrid power projects), based on the rates discovered through competitive bidding, the distribution licensees may approach the Commission for adoption of the tariff discovered through such Competitive Bidding Process.



3.1.5. Further, as stated earlier, the Control Period under the present dispensation expired on March 31, 2023. The Commission vide Order dated 17th March 2023 in Petition No. 2128 of 2022 has extended the control period of the Tariff Order No. 04 of 2021 up to 19th June 2023. The present Discussion Paper outlines the proposed approach and tariff framework for the control period starting from 20th June 2023 to 31st March 2026.

3.2 Tariff framework for the Project above threshold limit

Type – A (Existing projects):

In case the existing wind /solar project which presently are tied up with GUVNL/DISCOM under long term PPA at feed-in-tariff/preferential tariff is allowed/permitted to be converted into hybrid by adding new solar/wind capacity, with mutual consent between developer & GUVNL/DISCOM. The tariff for newly converted hybrid projects above the threshold limit for participation in bidding, shall be discovered through tariff based competitive bidding under Section 63 of the Act as proposed in this discussion paper. The tariff for newly converted Hybrid Projects below threshold limits shall be as proposed in para 3.1.2 above.

Captive owner itself or in case of third-party sale, both the seller and suppliers with mutual discussions eligible to convert existing project into the Hybrid Project. In case the developer intends to convert existing solar/ wind captive/third party project into hybrid power by adding new solar/wind capacity for the purpose of captive use or third party sale.

In the above cases, the developer has to (i) registered Hybrid Power Project as afresh with GEDA, (ii) need to execute fresh transmission and wheeling agreement with GETCO and/or (iii) shall pay the OA charges & losses and banking facility and charges as specified in this discussion paper.

3.3 Tariff framework for Type B (New projects)

The tariff for the new hybrid projects above threshold limit shall be discovered as per tariff based competitive bidding guidelines issued by MoP under Section 63 of the Act. The Commission may adopt such tariff.



Projects set up under OA regime for captive use or third party sale shall have to pay the Open Access charges and transmission losses and wheeling loss specified in this discussion paper.

3.4 Tariff framework for the Project below threshold limit

Threshold limit means for Wind-Solar and Storage, if any, Hybrid Project shall be 50 MW or as case may be specified by Ministry of Power, Government of India and/or Commission from time to time.

There could be cases of Wind Solar Hybrid Power Projects below the threshold limit of eligibility (50 MW) for participating in Competitive bidding. The threshold limit is consist of new capacity and add existing capacity of Wind/Solar Hybrid Project. The Commission proposes to determine the tariff for the Wind Solar and Storage, if any, Hybrid Projects falling below the threshold limit of eligibility for participating in the Competitive Bidding Process as given below:

Tariff for Wind Solar and Storage, if any, Hybrid Power Projects falling below the threshold limit of eligibility shall be considered equal to the weighted average tariff (of Wind, Solar & Wind-Solar and Storage, if any, Hybrid) available as on 1st April or 1st October depending on the commissioning date of the project and adopted by the Commission.

For Type – A (Existing projects):

The purchase of power from existing wind/solar capacity shall be in accordance with the respective PPAs with Distribution licensees. The purchase of power from additional /new capacity shall be at the weighted average tariff (for respective RE addition capacity i.e., Wind Solar and Storage, if any, Hybrid Power Projects), available as on 1st April (as discovered in the Competitive Bidding by GUVNL/ distribution licensees during previous six months October-March and adopted by the Commission) shall be applicable for the projects to be commissioned under PPAs signed during April-September.

Similarly, the weighted average tariff (for respective RE addition capacity i.e., Wind Solar and Storage, if any, Hybrid Power Project), available as on 1st October (as discovered in the



Competitive Bidding by GUVNL/distribution licensees during previous six months April-September and adopted by the Commission) shall be applicable for the projects to be commissioned under PPAs signed during October-March.

For Type-B (New Projects)

For the Hybrid Project below 50 MW capacity the distribution licensee may purchase the electricity with consideration of the following mechanism:

The purchase of power from such projects shall be at the weighted average tariff (of Wind, Solar & Wind-Solar Hybrid) available as on 1st April or 1st October depending on the commissioning date of the project. The weighted average tariff as on 1st April (as discovered in the Competitive Bidding by GUVNL/ distribution licensees during previous six months October-March and adopted by the Commission) shall be applicable for the projects to be commissioned under PPAs signed during April-September. Similarly, the weighted average tariff of Wind, Solar & Wind-Solar Hybrid available as on 1st October (as discovered in the Competitive Bidding by GUVNL/ distribution licensees during previous six months April-September and adopted by the Commission) shall be applicable for the projects to be commissioned under PPAs signed during October-March.

In case weighted average tariff is not available for particular 6 months' period then latest weighted average tariff available for 6 months' period shall be considered. GUVNL/ distribution licensees shall place on its website the applicable tariff on which it will buy the energy generated from such Wind Solar Hybrid Power Projects. GUVNL/ distribution licensees shall communicate the link to other licensee who shall then upload such link on its respective websites. The rate will be updated every 6 months.

The distribution licensee shall procure power from Wind/Solar Hybrid Project above threshold limit i.e., 50 MW only through Competitive Bidding Process.

3.5 General Principle:

Under this section the general principles such as control period, tariff period, plant life etc. has been discussed.



3.5.1 Control Period:

The Commission proposes that the control period of the tariff framework under this discussion paper shall be effective from 20th June 2023 to 31st March, 2026.

3.5.2 Useful life of Plant:

The Useful Life for the Wind Solar Hybrid Power Projects to be commissioned during control period of this order shall be considered as 25 years from date of commissioning.

3.5.3 Tariff Period:

The tariff period for the tariff proposed by the Commission for procurement of electricity from Wind- Solar and Storage, if any, Hybrid Power Projects will be of 25 years from the date of commissioning of such projects.

3.5.4 Eligible Unit:

Any individual, company or body corporate or association or body of individuals, whether incorporated or not, or artificial juridical person, shall be eligible for setting up of new Wind-Solar and Storage, if any, Hybrid Projects OR shall be eligible to add wind/solar capacity at their existing solar/wind power projects, respectively, either for the purpose of captive use and/or for selling of electricity, in accordance with the Electricity Act, 2003, Rules and Regulations framed thereunder as amended from time to time. The wind and solar generation and storage, if any, may be metered separately at the pooling/sending end Sub-Station.

The choice of capacity mix between Wind and Solar and Storage, if any shall be the discretion of the Developer or as per the individual schemes as notified by the State or Central Government from time to time. However, at the locations of having good wind power potential, the Solar PV capacity to be added as the Solar-Hybrid component could be relatively smaller. Similarly, in case of the sites where the Wind Power Density (WPD) is relatively lower or moderate, the component of the Solar PV capacity could be relatively on a higher side. The ratio of different technology mix of Wind-Solar and Storage if any, percentage as a part of Hybrid Project shall be in accordance with the Notification of MNRE in this regard.



For simplicity purpose, Wind-Solar Hybrid Power Generation Plants shall be divided into two categories:

(i) Type-A Projects

This category shall include conversion of existing/under-construction wind or solar power plants into Hybrid Projects. Wind/Solar capacity under construction shall be considered based on the Registration Certificate issued by GEDA and evacuation permission granted by GETCO and/or DISCOMs to the Solar/Wind Project Developers. The installed Wind/Solar Capacity shall be considered based on Power Purchase Agreement (PPA)/Bulk Power Transmission Agreement (BPTA)/Wheeling Agreement capacity.

(ii) Type-B Projects

This shall include new Wind-Solar and Storage, if any Hybrid Power Generation Projects which are not registered with GEDA or evacuation permission is not granted by GETCO/DISCOMs. The Wind-Solar Hybrid Power Projects to be commissioned under PPAs signed during the new control period will be eligible to sell power to distribution licensees of Gujarat at the tariff approved by the Commission under this Tariff framework.

3.5.5 Forecasting and scheduling for Wind Solar Hybrid Power:

The Wind-Solar Hybrid Projects shall require to follow the provisions as prescribed under the GERC (Forecasting, Scheduling, Deviation Settlement and Related Matters of Solar and Wind Generation Sources) Regulations, 2019 notified dated 19th January, 2019 and its amendments issued from time to time.

3.5.6 Applicability of Merit Order Dispatch Principle:

Wind-Solar Hybrid Power Projects irrespective of the plant capacity shall be treated as 'MUST RUN' power plants and shall not be subjected to merit order dispatch principles.

3.5.7 Reactive Energy Charge:

The Reactive Energy Charges as approved by the Commission in tariff orders for the Gujarat Energy Transmission Corporation Ltd. (GETCO) from time to time shall be applicable to such projects.



3.5.8 Metering point and Interconnection point:

The metering and interconnectivity shall be as under:

- a) Energy generation from wind /solar capacity shall be measured separately at the pooling/sending end sub-station on 15 /5-minute time block by installing four Quadrant ABT compliant meters by the project developers. The project developers shall also have to install Remote Terminal Unit (RTU) and communications facilitated for transferring the real time data to SLDC for its monitoring purpose. Further, four quadrant ABT compliant meter shall be installed on each wind turbine/solar projects. All the meters will be tested in NABL laboratory and duly sealed by DICOMS. Meters shall be installed in presence of DISCOM/GETCO at the time of commissioning the Wind/Solar project and sign on such documents. The meters shall be AMR compatible so that data can be fetched at GEDA, DISCOM and SLDC remotely.
- b) For the purpose of commercial settlement and energy accounting, the metering point shall be at the receiving end sub-stations of GETCO. The injection of energy from wind/solar capacity shall be worked out separately at the receiving end sub-stations of GETCO on the basis of meter reading of common meter installed at receiving end sub-stations appropriately apportioned as per the respective meter reading (active and reactive) of wind and solar ABT (four quadrant) meters installed at respective wind and solar project separately.
- c) In case of Type-A projects (Existing Projects), the metering/injection point shall continue to as per existing agreement with GETCO /DISCOM.
- d) In case of Type-B Projects (New Projects) that are AC or DC integrated, the metering point shall be at the receiving end of the GETCO substation. Developer shall have to install the ABT (four quadrant) Main & Check meter at their own cost duly tested sealed and installed in presence of DISCOMs' representatives. Developer shall install such meters at receiving end of GETCO sub-station as well as at Wind and Solar PV System Installations in view of the different tariff and RPO. In case of common hybrid tariff and common RPO, a single meter as per above specification for both wind and solar system shall suffice.



- e) For Type-A Projects (Existing Projects), both Wind and Solar PV Systems shall use separate set of internal electrical lines and equipment and connect to the pooling/sending-end substations of the Hybrid Projects. The projects shall be mandatorily metered separately. Developers shall have to install ABT (four quadrant) meters at Wind and Solar PV System Installation as well as receiving end of the GETCO substations at their own cost duly tested sealed and installed in presence of DISCOM.

- f) Internal connectivity between solar and wind capacity prior to pooling/sending-end substation shall be allowed for Type B Projects (New Projects) once a common RPO and hybrid tariff are present. Energy metering and communication facility shall be provided by the project developer's hybrid power projects in accordance with the following Regulations/Codes/Orders and their subsequent amendments:
 - i. Central Electricity Authority (Installation and Operation of meters) Regulations 2014 and its subsequent amendments
 - ii. Gujarat Electricity Grid Code 2013 and its subsequent amendments
 - iii. GERC (Terms and Conditions of Intra-State Open Access) Regulations, 2011 and its subsequent amendments
 - iv. GERC Distribution Code 2004 and its subsequent amendments

For the purpose of energy accounting, all projects shall have to provide ABT compliant (four quadrant) meters at generators and if the power is to be wheeled to consumers' premises, then ABT cum Tariff compatible meter is to be installed at the consumers' premises also. GEDA/GETCO/DISCOMs shall ensure the energy accounting of Active and Reactive energy of the Wind/Solar and/or Hybrid for each consumer/customer. Energy Accounting be done by SLDC.

3.6 Wind- Solar Hybrid System & Power Evacuation:

Hybridization of Type-A Projects (Existing Projects):

Existing Wind power or Solar Power Projects Developers, willing to install Solar PV plant or Wind Turbine Generators respectively, at the existing location, shall be allowed to do so with following conditions:



- i. The total power injection (combined wind and solar) into the grid shall not be more than the transmission capacity/grid connectivity allowed/sanctioned by GETCO for this purpose. In case, addition/augmentation in the existing evacuation system is required as per the system study undertaken by GETCO due to addition of Wind/Solar and Storage Capacity, if any, Developers shall undertake such addition/augmentation in the system up to the receiving end sub-station of GETCO at their own cost. However, the primary focus is to optimize the utilization of existing transmission infrastructure and technologies, and design approaches towards minimum augmentation is encouraged.
- ii. The additional solar/wind power from the Hybrid Project may be allowed to wheel power for captive use or for sale of power to a third-party or sale to DISCOMs. For transmission and wheeling of power, the applicable charges and losses shall be as specified in this Order.
- iii. The Developers shall approach GETCO for determining the transmission capacity available to evacuate the additional wind/ solar power or any augmentation that may be required. GETCO shall provide the relevant data with regards to the transmission capacity utilization on its existing network.

2. Type-B Projects (New Projects)

- i. The Developers of Hybrid Projects shall establish the evacuation line at their own cost up to the receiving end sub-station of GETCO.
- ii. The Developer has option for wheeling of wind and solar power for their captive use or third-party sale or sale of power to the DISCOMs. For transmission and wheeling of power, the applicable charges and losses shall be as specified in this Order.
- iii. Hybrid Project Developer shall approach GETCO for evacuation system planning up to the receiving station.

For both Type-A and Type-B Hybrid Projects, the Developer shall ensure for capacity allocation/sanction of transmission capacity at least equal to installed capacity of wind or solar project, whichever is higher. In case, total injection of power from Hybrid Project exceeds such allocated/sanctioned transmission capacity shall be avoided/restricted by providing necessary protection system so that such incident may not affect real time grid management to grid operators. Further in the above case, such additional power



generated from allocated/sanctioned capacity shall be considered as inadvertent flow of power and shall not be considered for commercial settlement.

Wind-Solar and Storage, if any, Hybrid Power Generation System, or the Hybrid Project, means the system of combined generation of Wind and Solar Power and Storage, if any, at existing or new Solar/Wind Power Projects with storage capacity, if any, (or) collocated where injection of wind or solar power is at the interconnection point of the pooling sub-station of existing windfarms/ sending-end sub-station of existing solar power installations with or without energy storage system.

Under the scheme of Wind-Solar Hybrid Power Generation, Wind and Solar PV Systems shall be connected at the same interconnection point at pooling/sending-end sub-station. In order to achieve the benefits of hybrid plant in terms of optimal and efficient utilization of transmission infrastructure and better grid stability by reducing the variability in renewable power generation, it is desired that:

- i. At the locations of having good wind power potential, the solar PV capacity to be added as the solar-hybrid component could be relatively smaller.
- ii. Similarly, in case of the sites where the wind power density is relatively lower or moderate, the component of the solar PV capacity could be relatively on a higher side. Evacuation capacity for the purpose of connectivity and injection of power shall be worked out as follows:

A. for Type-A Projects (Existing Projects) where –

- a. Open Access is already granted to the extent of rated capacity of transmission line/substation of GETCO and injection of power from additional wind/ solar capacity to be set up, is restricted up to already granted rated capacity of transmission line/ substation of GETCO. The same shall be allowed without applicability of transmission charges on such additional capacity. However, the transmission losses and wheeling charges/losses shall be made applicable to such capacity as applicable to any other solar or wind project as the case may be. In case total hybrid generation exceeds the transmission capacity limit, it shall be



considered as inadvertent injection of power for which no payment or credit shall be given or under any exigency which requires curtailment of generation, the generation from additional/new wind/ solar capacity shall be curtailed first.

- b. There is capacity margin in the existing transmission system/ sub-station of GETCO after taking into account open access already granted to the existing wind/solar project or any augmentation and strengthening of transmission system after receiving-end sub-station is undertaken by GETCO for allocation/sanction of transmission capacity for allowing additional wind/ solar capacity, the transmission charges and losses, and wheeling charges and losses shall be applicable on such additional sanctioned/allocated capacity as applicable to any other Solar/ Wind Project as the case may be. However, if any augmentation in the existing transmission system is required due to addition of such solar/wind capacity, up to receiving end substation of GETCO, the same shall be undertaken by the Developers at its own cost.

B. For Type-B Projects (New Projects)

The Developer of Hybrid Project shall establish a dedicated line at its own cost for evacuation of power up to receiving end sub-station of GETCO as per system study undertaken by GETCO where the Project Developer desires to inject power in the State Grid. From there onwards, GETCO shall ensure transmission system and connectivity. Transmission charges shall be applicable on the basis of sanctioned/ allocated transmission capacity. However, Developer shall ensure that power injection shall never increase beyond sanctioned/allocated transmission capacity. In case total hybrid generation exceeds the transmission capacity limit, it shall be considered as inadvertent injection of power for which no payment or credit shall be given. Transmission charges and losses, and wheeling charges and losses shall be applicable as applicable to any other open access for wind and solar projects.



3.7 Operation and maintenance of dedicated lines

The Operation and Maintenance of dedicated evacuation line including the bays shall be carried out by the GETCO at the cost of Developer of Hybrid Projects as per applicable technical standards and best practices.

3.8 Transmission and Wheeling Charges:

Third Party Sale

- a. In case of injection of the electricity at 66 KV level or above and drawal of electricity up to 66 KV level, the transmission of energy from the injection point to drawal place by paying transmission charges and losses determined by the Commission.
- b. In case of injection of energy at 66 KV level and drawal of energy at 11 KV voltage level in such case, wheeling of Power for third party sale from Hybrid power projects shall be allowed on payment of transmission charges applicable on sanctioned/allocated transmission capacity, transmission losses on energy feed basis, wheeling charges and losses on the energy fed into grid as measured at receiving Sub-Station of GETCO, as applicable to normal open access consumer.
- c. The Cross Subsidy Surcharge and Additional Surcharge, is applicable to the consumer, as per the provisions of the Green Energy Open Access Rules and its subsequent amendments thereto notified by Ministry of Power, Govt. of India read with GERC (Green Energy Open Access) Regulations and as amended from time to time.

Wheeling of power for Captive Use

- a. In case of injection of energy is at or above 66 KV voltage level and drawal of such energy up to 66 KV voltage level in such case, normal transmission charges and losses shall be applicable.
- b. In case of injection at 66 KV and drawl at 11 KV voltage level, wheeling of electricity generated from the Hybrid Project to desired location(s) within the State shall be allowed on payment of transmission charges and transmission losses as applicable to normal open access consumer and wheeling charges and distribution losses of the energy fed to the grid at the receiving end sub-station of GETCO, as applicable to normal Open Access Consumers.



Provided that the entity consuming energy generated from Hybrid project for captive consumption shall require to establish/prove on annual basis that the ownership in Captive Generating Plant and consumption of such energy shall fulfil the necessary conditions stipulated in Electricity Rules, 2005 with the Distribution licensee in whose area consumer consumed energy generated from hybrid power projects. Failure to fulfil the aforesaid two conditions, such captive consumption lose the status of captive plant and it shall be qualified as supply to third party by generator and the benefits granted to captive consumption shall be withdrawn for that Financial Year and it attracts the applicability of the Cross-Subsidy Surcharge and Additional Surcharge applicable to normal Open Access Consumer prevailing at relevant time as per this Order.

The captive consumers shall provide the details of ownership in the captive generating plant and generation as well as consumption of energy from captive generating plant to the distribution licensee in whose area of supply captive consumer is situated. The Distribution Licensee shall verify the status of the captive consumers on annual basis. In case of failure to the status of captive generating plant and captive use of energy by the consumer the action may be initiated as stated above.

Wheeling of power to more than one locations

Hybrid Project Developers, who desire to wheel electricity to more than one location for captive use/third-party sale, shall pay 5 paise per unit on energy fed in the grid as measured at receiving end sub-station of GETCO, to the concerned DISCOM in whose area power is consumed in addition to above mentioned transmission charges and losses, as applicable.

Provided that in all above cases, total injection of power from the Hybrid Project exceeds such allocated/sanctioned transmission capacity, such power shall be considered as inadvertent flow of power and shall not be considered for any commercial settlement.

3.9 Banking of Surplus Energy

Like Wind & Solar technology, as a promotional measure, the Commission endeavor to continue to extend the banking facility to Wind Solar and Storage, if any, Hybrid Power Projects set up under OA regime for captive transaction or third-party, transaction whatever may be the case. The settlement of energy from the hybrid projects shall be allowed on the billing cycle basis. The settlement of energy in case of



wind power projects set up under OA regime shall be allowed on peak and off-peak hours' basis.

As per Ministry of Power, Green Energy Open Access Rules 2022, banking is permitted on billing cycle basis on payment of charges to compensate additional cost, if any to the distribution licensee. Banking charges shall be applicable as per provisions under MoP's Green Energy Open Access Rules 2022 read with GERC Green Energy Open Access Regulations in force and as amended from time to time. Further, the permitted quantum of banked energy by the Green energy open access consumers shall be at least thirty percent of the total monthly consumption of the electricity from the distribution licensee by the consumer.

3.10 Energy Accounting:

Energy Accounting related provision as provided below shall be applicable to captive as well as third party open access transaction.

- 1) The project which are not registered under REC mechanism and availing banking facility, the energy accounting shall be carried out by energy injection worked out at the receiving end sub-station of GETCO, shall be set-off against the consumption during the consumers' billing cycle.
 - i. For net import of power, DISCOM shall charge applicable tariff of respective category to the Consumer including fixed/ demand charge, energy charges, peak charge, other charges/ penalty etc. as applicable to other Consumers.
 - ii. Surplus power available, after giving set-off, at the end of billing cycle shall not be entitled for any compensation.
 - iii. No carry forward of surplus energy, if any, available at the end of billing cycle.
 - iv. The surplus energy, if any, available at the end of billing cycle, is eligible for REC. The distribution licensees shall certify the same as per MoP Green Energy Open Access Rules 2022 and its subsequent amendments thereto.
 - v. The consumers/project developers shall require to pay banking charges as specified in the Green Energy Open Access Rules notified by the Ministry of Power,



Government of India read with provisions of GERC (Green Energy Open Access) Rules in force and as amended from time to time.

- vi. The consumer/project developers not desire to utilise the green energy attributes (RE) component for fulfilment of RPO, the distribution licensee shall have considered such consumed energy of the consumers as fulfilment of its different types of RPO based on such energy consumed.
 - vii. The consumer who utilise RE (Green Energy) component for fulfilment of its RPO percentage, in such case, consumption of RE (Green Energy) be qualified as fulfilment of RPO.
- 2) **Case 2 (b):** For hybrid projects registered under REC mechanism and supply power within the State, the Energy accounting shall be based on a 15-minute time block-basis.
- i. For net import of power, the DISCOM shall charge applicable tariff of respective category to the Consumer including fixed/ demand charge, energy charges, peak charge, time of use charges, other charges/ penalty, etc. as applicable to other Consumers as per tariff orders of the Commission.
 - ii. Surplus power, after giving set off, shall not be eligible for any compensation.
- 3) **For Type-A Projects (Existing Projects),** the energy accounting for consumption of power for captive use / third party sale from existing wind/solar project shall be governed by existing Regulations / Orders / wheeling agreement. If these provisions are different, the above provisions shall be applicable only for wheeling of power from new/additional wind/solar capacity, as a part of Hybrid Projects.

3.11 Project registered under REC Mechanism:

- a. Hybrid Projects availing open access for captive use/ third-party sale under REC mechanism shall be governed as per CERC REC Regulations.
- b. Such projects shall be allowed to wheel the electricity on payment of applicable transmission charges/losses, wheeling charges/losses and other charges as applicable to other normal Open Access Consumers.



- c. Cross Subsidy Surcharge and Additional Surcharge shall be applicable as applicable to normal Open Access Consumers.

3.12 Restrictions:

Second hand WTGs/ solar modules or other electrical and mechanical equipment shall not be eligible for installation under this Policy.

3.13 CDM Benefits:

It is proposed that the sharing of CDM benefits or any other benefit such as carbon credit or any other benefits under CDM or any other mechanism under any provision from any source providing such benefits to the Solar –Wind Hybrid Power Project for which it shall qualify to receive such benefit may apply to the concerned authority to avail / receive the benefit for the project. The benefits which shall be receivable or received shall be shared with the procurer of power and / or licensee as under:

- (i) 100% of the gross proceeds on account of such CDM benefit or any other benefit such as carbon credit or any such benefit or any other mechanism from any source or agency to be retained by the project Developer in the first year after the date of commercial operation of the generating station.
- (ii) In the second year, the share from above benefits of the Beneficiaries like power procurer/licensee shall be 10% which shall be progressively increased by 10% every year till it reaches 50%, where after the proceeds shall be shared in equal proportion, by the Generating Company and the Beneficiaries like power procurer/licensee.”
- (iii) In case of PPA signed under competitive bidding process, the sharing of benefits received by the Hybrid project shall be as per terms and conditions of bid documents read with the PPA.

3.14 Security Deposit:

- a. The Hybrid Power Developer setting up project shall be required to provide Bank Guarantee @ ₹ 15 lakhs per MW to GETCO based on allotment of transmission



capacity and in case the Developer fails to commission the Hybrid capacity within the time period mentioned hereunder, GETCO shall encash the Bank Guarantee.

- b. The Developer shall commission new Hybrid capacity at least 10% of the allotted capacity within one month of charging of evacuation line, failing which, the Developer shall be liable to pay long term transmission charges for 10% of allotted capacity till such 10% of allotted capacity is commissioned.

Security Deposit

Sr. No.	Hybrid Capacity in MW	Period for commissioning the entire evacuation line along with bays and metering system
1.	1 MW to 100 MW	1.5 years from date of allotment of transmission capacity
2.	101 MW to 200 MW	2 years from date of allotment of transmission capacity
3.	201 MW to 400 MW	2.5 years from date of allotment of transmission capacity
4.	401 MW to 600 MW	3.5 years from date of allotment of transmission capacity

Provided that with prior approval of the Commission, GETCO shall issue extension on case to case basis to the Developers if they fail to commission the entire evacuation line along with bays and metering system within the stipulated time period due to unforeseen reasons.

In case of State level bid, the Commission shall approve the bid / PPA documents when the same shall be submitted before Commission for approval. Long term transmission charges are applicable as decided by the Commission in the GETCO's tariff order, from time to time.

3.15 Procedure for Integration of Wind Solar Hybrid project and Battery Energy Storage to the grid

The Commission proposes that prior to commissioning and Integration of Wind-Solar and Storage if any, Hybrid Project shall be as per the following procedures and amendments made in it from time to time in this regard.



The generating station based on Wind-Solar and Storage if any, shall submit a certificate signed by the authorised signatory not below the rank of CMD or CEO or MD or Full Time Director to the concerned SLDC, GEDA and distribution licensees before declaration of SCOD, that the said generating station including main plant equipments such Wind Turbines or Solar inverters, Storage Systems or auxiliary Systems, as case may, has complied with all relevant provisions of CEA Technical Standards for Connectivity, CEA Technical Standards for Communications, CEA (Measures relating to Safety and Electricity Supply) Regulations, 2010 and Gujarat Grid Code.

GEDA shall ensure following compliance from the Wind Solar Hybrid Project developers before carrying out testing, commissioning activities and issuing the Commissioning Certificate to the hybrid project and failure to it the certificate, if any, issued is not valid.

i. Document Submission to SLDCs

The following documents shall be submitted to SLDC proposed date of commencement of first time charging activities

- a) Connectivity Details: Connection Agreement and connectivity grant letter by STU,
- b) Copy of Coordination Agreement with the Qualified coordinating Agency(QCA)/Lead/Principal Generator, if any
- d) Copy of agreement(s) between HPPD and HPD, if any,
- e) Technical Details- Below mentioned technical details to be submitted: -
 - i. Static Details: Details of wind solar Hybrid power plant, Static parameters for wind generating station and Static parameters for solar generating station has been provided as per the details provided below Table No – and Table No below:

Table 8: Static Data for Wind Generating Station

Sr. No	Particulars
1	Type
2	Manufacturer
3	Make



4	Model
5	Capacity
6	Commissioning date
7	Hub Height
8	Total Height
9	RPM Range
10	Rated Wind Speed
11	Performance Parameter
12	Rated Electrical power at rated wind speed
13	Cut in wind speed
14	Cut out wind speed
15	Survival speed (Max wind speed)
16	Ambient temp for out of operation
17	Ambient temp for in operation
18	Low Voltage ride through (LVRT)
19	High Voltage ride through (LVRT)
20	Lightning strength (KA & Coulombs)
21	Noise Power level (db)
22	Rotor
23	Hub type
24	Rotor Diameter
25	Number of blades
26	Area swept by blades
27	Rated Rotational speed
28	Rotational Direction
29	Coning Angle
30	Tilting Angle
31	Design Tip speed ratio
31a	Height f Hub with respect to mean sea level
32	Blade
33	Length
34	Diameter
35	Material
36	Twist Angle
37	Generator
38	Generator type
39	Generator number of poles
40	Generator speed
41	Winding type
42	Rated Generation Voltage
43	Rated Gen frequency



44	Gen Current
45	Rated temp of generator
46	Generator cooling
47	Generator Power Factor
48	KW/MW @rated wind speed
49	KW/MW @ peak continuous
50	Frequency controller
51	Transformer
52	Transformer capacity
53	Transformer cooling type
54	Voltage
55	Winding configuration
56	Weight
57	Rotor Weight
58	Tower Weight
59	Nacelle Weight
60	Over speed protection
61	Design life
62	Design standard
63	Latitude
64	Longitude
65	CoD details
66	Distance above mean sea level /Height of installation with respect to mean sea level

Table 9: Static Data for Solar Generating Station

Sr. No	Particulars
1	Latitude
2	Longitude
3	Power Curve
4	Elevation and orientation angle of Arrays
5	Generation capacity of generating facility
6	Distance above mean sea level
7	CoD details
8	Rated voltage
9	Details of type of mounting (tracking , single axis, double axis , auto/manual)
10	Manufacturer and model (imp component such as panel, inverter, cable, solar panel , transformer etc
11	D C installed capacity
12	Module cell technology



13	I-V Characteristics of module
14	Inverter rating at different temp
15	Inverter efficiency curve
16	Transformer capacity & rating

It is also necessary that the Solar-Wind and Storage, if any, Hybrid Power Project connectivity with grid/commissioning of plant shall be allowed by GEDA/DISCOMs/GETCO representative by verifying that such RE generators must be complied with CEA's Connectivity Standard Regulations and it shall be recorded in commissioning certificate during the inspection and commissioning activities.

3.16 Commissioning the Hybrid Project:

After following the procedure of integration of Hybrid Project with grid the commissioning of Hybrid Projects be followed. "Commissioning" with respect to the Hybrid project shall be certified by the GEDA in presence of GETCO and distribution licensee representative. GEDA should ensure that all equipment as per MNRE approved list of Solar panel manufacturers and WTG manufacturers of rated capacity and as per Indian Standards on Renewable Energy notified by BIS has been installed and energy has flown into the grid and recorded in the energy meters installed at project site and witnessing of such generation of electricity by representative authorised by DISCOM/GETCO. GEDA shall co-ordinate with DISCOMs/GETCO for fixing date of commissioning of plant and visit and decide the same. The representatives of GEDA, GETCO and distribution licensees shall sign on the commissioning of project. Non-signing of documents of commissioning of Hybrid Projects by any of the representative of above entity is not qualify for commissioning of the project. The commissioning certificate consists of the details of the Wind Turbine and Solar modules and inverter details. Moreover, GEDA shall also ensure about the solar modules, details of RFID, modules.

Further, it shall also ensure that generation data from the hybrid project shall also be transferred in the real time basis through RTU to SLDC".



GERC presents this discussion paper to initiate the regulatory process for determination of tariff framework for Procurement of Power by the distribution licensees and others from Wind-Solar and Storage if any, Hybrid Power Project for State of Gujarat for the next control period starting from 20.06.2023 after considering comments received from stakeholders.

GERC invites comments from potential stakeholders on the above discussion paper. Stakeholders may offer their views / objections / suggestions as per the procedures prescribed in the GERC (Conduct of Business) Regulations, 2004 on or before 03.07.2023.

Public hearing in this regard shall be on 10.07.2023 at 11.30 a.m. in the Commission's Office. Stakeholders either in person or through their authorized representative may remain present.

Sd/-
[Roopwant Singh, IAS]
Secretary
Gujarat Electricity Regulatory Commission
Gandhinagar, Gujarat

Place: Gandhinagar
Date: 17.06.2023