



## **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 3<sup>rd</sup> 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 3<sup>rd</sup> 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 17<sup>th</sup> March 2023 in Petition No. 2128 of 2022 has extended the control period of the Tariff Order No. 04 of 2021 up to 19<sup>th</sup> 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 1<sup>st</sup>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 (for respective RE addition capacity i.e. Wind or Solar and Storage capacity, if any), available as on 1<sup>st</sup> 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 1<sup>st</sup> 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 1<sup>st</sup> 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 19<sup>th</sup> 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

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



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



<b>RTC</b>	Round the Clock
<b>SECI</b>	Solar Energy Corporation of India
<b>SERC</b>	State Electricity Regulatory Commission
<b>T&amp;D</b>	Transmission & Distribution
<b>TPC-D</b>	Tata Power Company Ltd – Distribution
<b>V</b>	Volt
<b>WPD</b>	Wind Power Density
<b>WTG</b>	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 03<sup>rd</sup> 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 17<sup>th</sup> March 2023 in Petition No. 2128 of 2022 has extended the control period of the Tariff Order No. 04 of 2021 up to 19<sup>th</sup> 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 6<sup>th</sup> June 2022 with amendments dated 27<sup>th</sup> 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 28<sup>th</sup> 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 14<sup>th</sup> 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 Gujrat Wind-Solar Hybrid Power Policy 2018

“Gujarat Wind-Solar Hybrid Power policy-2018” notified by Govt. of Gujrat on 20<sup>th</sup> 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 31<sup>st</sup> 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%