GUJARAT ELECTRICITY REGULATORY COMMISSION

GANDHINAGAR

Order No. 2 of 2016

In the matter of: Determination of Tariff for Procurement of Power by the Distribution Licensees and Others from Wind Power Projects.

In exercise of the powers conferred under Sections 3(1), 61(h), 62(1)(a) and 86(1)(e) of the Electricity Act, 2003, guidelines of the National Electricity Policy, 2005, Tariff Policy, 2016 and all other powers enabling it in this behalf, the Gujarat Electricity Regulatory Commission (hereinafter referred to as "the Commission") determines the tariff for procurement of power by the Distribution Licensees and Others in Gujarat from wind power projects.

This order is the fourth order on wind energy and is the culmination of an elaborate consultative process after considering the suggestions received from various stakeholders.

1. BACKGROUND

1.1 Potential for Wind Power

National Institute of Wind Energy (NIWE), formerly known as Centre for Wind Energy Technology (C-WET), under the Ministry of New and Renewable Energy (MNRE), Government of India, in association with Riso DTU National Laboratory for Sustainable Energy(NLSE), Denmark, developed the Indian Wind Atlas which has been published in April 2010. In year 2015, NIWE revisited this study under the guidance and directives of MNRE, with realistic and practical assumptions and advanced modeling techniques and estimated wind power potential in India at 100m hub height as 302 GW. As per this study the installable wind power potential of Gujarat state at 100m hub height is estimated as 84,431 MW. The study was performed with actual land availability estimation using NRSC 56m resolution land use land cover (LULC) data (AWiFS) 1:250K scale and with consideration of 6MW/sq.km. While developing the Wind Atlas, zones with Capacity Utilization Factor of 20% and more have been considered for wind potential estimation.

1.2 Government of Gujarat Wind Power Policy - 2016

Government of Gujarat has notified the 'Wind Power Policy – 2016' on 2nd August 2016. Salient features of the Policy are given below:

- This policy will remain in operation up to 30th June 2021 from date of issue.

- WTG installed capacity for captive use shall be allowed up to 100% of contracted demand /sanctioned load of consumer in case of MSME unit(s) and 50% of contracted demand/sanctioned load in case of other consumers. Above limit is not applicable to the captive consumer (MSME/Non MSME) who establish single WTG up to 2.7MW.

- The evacuation facility from the wind farm sub-station to GETCO sub-station shall be erected by developer at their own cost. The voltage level for evacuation of wind power shall be 66 kV and above in accordance with the GERC supply code.

- The electricity generated from the WEGs, shall be metered and readings taken jointly by Wind Power Project Developer with GEDA and GETCO at the metering point on a monthly basis. For the purpose of accounting, each WTG shall have to provide ABT compliant meters.

- Obligated entities may purchase wind power to fulfil their RPO at the tariff determined by GERC or rate discovered through competitive bidding.

- Concessional wheeling charges and wheeling losses in case the energy is wheeled at below 66 kV voltage level for captive wind power projects.

- In case of third-party sale, normal open access charges and losses, 50% of CSS and additional surcharge as applicable to normal open access consumers shall be applicable.

- Electricity generated from WEGs for self-consumption / sale to third-party within the state shall be exempted from payment of Electricity Duty.

- Energy Accounting procedures with regard to Open Access transaction in three possible scenarios has been provided (i) consumer does not take renewable attribute of wind energy for meeting its RPO (ii) Consumer takes renewable attribute of wind energy for meeting its RPO (iii) Generator is registered in REC Mechanism. One month's banking facility is provided to the projects falling in (i) Case 1 with no such provision for the projects falling in (ii) Case 2 (a) and (iii) Case 2 (b).

- The project developers are required to furnish the Bank Guarantee of Rs. 5 Lakh/MW to GETCO in order to ensure the timely completion of wind energy project and to ensure the timely utilisation of infrastructure created by GETCO. The bank guarantee will be encashed by GETCO in case the wind farm sub-station and transmission line is not commissioned within the specified time line.

1.3 GERC Multi Year Tariff Regulations, 2016

The Commission had notified 'Multi Year Tariff Regulations, 2016' on 29 March, 2016, which is applicable for determination of tariff for all existing and future Generating Companies, Transmission Licensees, Distribution Licensees, and their successors, if any. It is through the framework of these Regulations, the Commission determines tariffs for various cases including supply of electricity by a Generating Company to a Distribution licensee, intra-state transmission of electricity, intra-state wheeling of electricity, retail supply of electricity, etc. The objectives of MYT Regulations are:

- Provide regulatory certainty to the utilities, investors and consumers.
- Address the risk sharing mechanism between utilities and consumers based on controllable and uncontrollable factors.
- Ensure financial viability of the sector to attract investment, ensure growth and safeguard the interest of the consumers.
- Review operational norms for generation, transmission, distribution and supply.
- Promote operational efficiency and through its improvement in the long term, rationalize tariffs.

  The Commission within the framework of these regulations and the broad principles outlined in the Tariff Policy of Central Government has determined the tariff for procurement of power by distribution licensees and others from wind energy projects in the state.

1.4 Renewable Purchase Obligation (RPO) in Gujarat

The Commission has amended the Principal GERC (Procurement of Energy from Renewable Sources) Regulations, 2010 on 4 March 2014 as GERC (Procurement of Energy from Renewable Sources) (First Amendment) Regulations, 2014 (Notification No. 2 of 2014) and specified the RE technology specific RPO targets for FY 2013-14 to FY 2016-17. The Regulations specify the RPO target of 7.75% out of 10% for the obligated entities to be met from procurement of energy generated from wind energy projects during FY 2016-17.

The Regulations recognise the certificates issued within the scope of Central Electricity Regulatory Commission's (CERC) Notification No. L-1/12/2010-CERC dated 14 January 2010 as the valid instruments for 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).

The RPO targets specified under above Regulations are applicable 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.

1.5 GERC Wind Tariff Order 2012

Gujarat Electricity Regulatory Commission (GERC), in its Order No. 2 of 2012 dated 08 August, 2012 determined the tariff for procurement of power by the Distribution Licensees and others from wind energy projects for the state of Gujarat. After due public consultation and regulatory process, GERC had offered single part levellized tariff of Rs 4.23 per kWh for procurement of wind power by the distribution licensees in the state. This tariff order was made applicable for the wind energy projects commissioned on or after 11th August 2012. The control period of this tariff order expired on 31 March 2016. Along with the rate for sale of electricity to Distribution licensees, the Commission in this order had addressed other commercial issues associated with wind power transaction for third-party sale and captive use. However, in review of the Commission’s Order No.2 of 2012, in Petition No.1243/2012 and Petition No.1249/2012, Commission had re-determined the tariff as Rs 4.15/kWh, which was made applicable for the projects commissioned during the control period from 11.8.2012 to 31.3.2016. The Commission through an order against suo-moto petition No. 1564 of 2016, dated 23.05.2016, decided that the tariff and other commercial terms as determined by the Commission in Order No. 2 of 2012 dated 8.08.2012 read with Order dated 7.01.2013 in Petition No. 1243 of 2012 and 1249 of 2012 shall be applicable to all wind power projects commissioned beyond 31.03.2016 till the new tariff order on this subject is issued by the Commission.

1.6 GERC Discussion Paper on Wind Tariff Determination

The Commission prepared a discussion paper on “Determination of Tariff for Procurement of Power by Distribution Licensees and others from Wind Power Projects for the state of Gujarat” for the new control period starting from the date of issue of the wind tariff order. The discussion paper was placed on the website of the Commission from 7th May 2016 to 20th June 2016 for inviting comments and suggestions from the stakeholders. The list of stakeholders who have filed their written objections and suggestions is provided in Annexure-I.

1.7 Public Hearing

A public hearing was held on 20th June 2016 at the office of the Commission to hear the stakeholder's views/suggestions/objections on the discussion paper. The list of those who participated in the hearing and made oral submission during the public hearing is provided in Annexure-II.

2. DETERMINATION OF TARIFF FOR PROCUREMENT OF POWER FROM WIND POWER PROJECTS

2.1Tariff Determination Methodology

The Commission has determined the wind power tariff based on the broad principles contained in the (i) GERC (Multi Year Tariff) Regulations, 2016, (ii) GERC (Procurement of Energy from Renewable Sources) Regulations, 2010 and (iii) CERC (Terms and Conditions for Tariff Determination from Renewable Energy Sources) Regulations, 2012.

2.2 Tariff Determination Approach

The Tariff Policy dated 28 January 2016, notified by the Central Government in pursuance of Section 3 of the Electricity Act, 2003 stipulates that the appropriate Commission may determine tariff for procurement of power by distribution licensees from non-conventional sources of energy under *Section 62 of the Electricity Act, 2003,* till issuance of notification of procurement of power from renewable energy sources through competitive bidding by Central Government. The relevant extract of para 6.4 of the Tariff Policy is given below:

".........(2) States shall endeavor 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."

The Commission in the discussion paper proposed 'cost-plus' methodology for determination of Tariff as adopted in previous tariff orders issued by the Commission during 2009 and 2012. It was further proposed that the distribution licensees may carry out the competitive bidding for procurement of electricity from wind power projects in the State. In case such tariff is determined through a transparent process of competitive bidding under Section 63 of the Act, the licensees may approach the Commission for adoption of tariff discovered through bidding. In such case, the distribution licensees are free to procure electricity from wind power projects at a tariff discovered under competitive bidding provided that the tariff determined by the Commission in this order shall act as a ceiling tariff. The proposal was initiated by visualizing the fact that the tariff of the solar based generation has substantially come down as a result of adoption of competitive bidding process for procurement of solar based generation in the country.

Suggestions of the Objectors

Some of the objectors suggested that in absence of bidding guidelines duly notified by the Ministry of Power, GoI, distribution licensees should not be allowed to procure wind power under Section 63 of the Electricity Act 2003 until the requisite guidelines are in place. Some of the objectors requested that wind and solar projects are not comparable with regard to initiating competitive bidding as in case of solar the radiation pattern is more or less similar and infrastructure facilities are usually provided by the government. In such situation, introduction of competitive bidding will hit the sustainability of wind power development business in the long run. The stakeholders requested that until a framework for competitive bidding is not in place, the distribution licensees should not be allowed to procure wind power through bidding process.

Commission's Decision

The Commission has observed that, as per the provisions of the Tariff Policy, procurement from renewable energy projects by distribution licensees is recommended through competitive bidding to keep the tariff low. However, such procurement has to be done through competitive bidding from the date of such notification by the Central Government.

In view of above, the Commission decides that the distribution licensees may procure electricity from the wind power projects at the tariff determined by the Commission under Section 62 of the Act under this order or may carry out competitive bidding for procurement of electricity from wind power projects through transparent process of bidding under Section 63 of the Act. The distribution licensees may approach the Commission for adoption of the tariff discovered through competitive bidding process. In such case, the tariff determined by the Commission in this order will act as a celling tariff.

2.3 Preferential Tariff

Clause 6.4(1) of the Tariff Policy, 2016 provides that the State Electricity Regulatory Commissions shall fix minimum percentage of power purchase from non-conventional energy sources, taking into account availability of such resources in the region and its impact on retail tariff. Clause 6.4(2) of Tariff Policy provides that states shall endeavor to procure power from renewable energy sources through competitive bidding from the date of notification to this effect from the Central Government. However, till such notification any such procurement of power from renewable energy sources 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. Keeping in view provisions of the Tariff Policy, and larger objectives with reference to climate change and global warming, the Commission has determined the tariff on cost-plus basis for procurement of wind power by the Distribution Licensees and others.

With regard to the structure and design of the tariff, following two approaches are possible:

i) Single-Part Tariff Vs Two-Part Tariff

Two-part tariff is generally adopted when the variable component is significant. In the case of wind energy generation, wind being the motive force which rotates the turbine and produces energy, there is no fuel requirement and hence the variable generation cost is nil. Therefore, the Commission has adopted single-part tariff for wind energy generation.

ii) Project Specific Tariff Vs Generic Tariff

A generic tariff mechanism would provide incentives to the investors for use of most efficient equipment to maximize returns and for selecting the most efficient site, while a project-specific tariff would provide each investor, irrespective of the machine type and the site selected, the stipulated return on equity and it would shield the investor from the uncertainties involved in capacity utilization due to machine choice and site location.

Considering the small capacities and diverse ownership of the wind power projects, the Commission decides to determine the generic wind power tariff, rather than going for a project specific tariff on case-to-case basis.

Tariff Design

The generic tariff in this order is determined on levellized basis. Levellization shall be carried out over the useful life of the wind power plant, and tariff is specified for the period equivalent to tariff period defined in this order. For the purpose of computation of levellized tariff, discount rate, as specified in this order, has been considered.

2.4 Computation of Tariff

2.4.1 General Principles

a. Control Period

The Commission in the discussion paper has proposed the control period from the date of this order to 31 March 2019.

Suggestions of the Objectors

One of the objectors requested to consider the control period from 1st April 2016 as pervious tariff order expired on 31st march 2016.

Commission's Decision

The previous wind tariff order No. 2 of 2012 dated 08.08.2012 was applicable up to 31st March 2016. In the meantime, the Commission initiated proceedings in suo-moto petition No. 1564 of 2016 for extension of the control period of said order till issue of new order. A public notice on the subject for inviting comments and suggestion of the stakeholders was published in newspapers on 22.03.2016. After due regulatory process, the Commission has extended the applicability of the Order No. 2 of 2012 dated 8.08.2012 read with Order dated 7.01.2013 in Petition No. 1243 of 2012 and 1249 of 2012 through an order dated 23.05.2016 in suo-moto Petition No. 1564 of 2016 till the new tariff order for procurement of wind power by the distribution licensees and others is issued by the Commission.

The Commission decided that the tariff and other commercial terms as determined by the Commission in the earlier order No 2 of 2012 dated 8.08.2012 read with Order dated 7.01.2013 in Petition No. 1243 of 2012 and 1249 of 2012 shall be applicable to the WTGs commissioned from 01.04.2016 onwards till the new tariff order is issued by the Commission. For long-term regulatory certainty to the investors, the Commission retains the control period as proposed in the discussion paper i.e. from the date of issue of this order to 31 March 2019.

b. Useful life of Plant

The Commission in the discussion paper has proposed useful life of 25 years for the wind power projects to be commissioned during the new control period starting from date of this order.

Suggestions of the Objectors

One of the stakeholders, suggested that considering the land lease period of 20 years, the project life of wind power projects to be considered as 20 years.

Commission's Decision

The CERC under 'RE Tariff Regulations 2012' has recommended 25 years as useful life of wind power project, including the evacuation line for tariff determination purpose. The Commission in its earlier tariff orders had also considered 25 years as useful life of wind power project. Moreover, it is a standard practice across the states. In view of this, the Commission decides to retain the useful life of wind power project as 25 years.

c. Tariff period

The Commission in the discussion paper has specified tariff period of 25 years for procurement of electricity from wind power projects to be commissioned during the new control period starting from the date of this tariff order.

No comments / suggestion were received from any of the stakeholders on this proposal. In view of the useful life of the project, the Commission decides to keep the tariff period as 25 years for wind power projects to be commissioned during control period starting from the date of this tariff order.

d. Eligibility Criteria

The Commission in its discussion paper has specified that the wind power projects using new wind turbine generators installed and commissioned after the notification of this wind tariff order will be eligible to sell power to distribution licensees of Gujarat at the tariff determined by the Commission in this tariff order.

Suggestions of the Objectors

Gujarat Urja Vikas Nigam Ltd (GUVNL) suggested that the tariff and terms and conditions decided in the present tariff order will be applicable to those projects for which PPA will be signed and wind capacity commissioned subsequent to the effective date of the present tariff order.

Commission's Decision

The Commission decides to retain the eligibility criteria as proposed in the discussion paper. The wind energy generators installed and commissioned for which PPAs would be signed during the control period of this order shall be eligible for sale of electricity at tariff determined by the Commission in this order. With regard to the submission of GUVNL, the Commission has provided its decision in Clause 5: Applicability of the order.

e. Scheduling of wind power

CERC has finalized the framework on forecasting, scheduling, and deviation settlement mechanism of RE generation based on wind and solar generators which qualify as regional entities as per the IEGC. After instituting an inter-state framework at central level, the Forum of Regulators (FoR) has framed model regulations on forecasting, scheduling, and deviation settlement of RE generation for the state level. Whenever such framework is implemented at state level, the provisions under the framework shall be applicable for the wind generators also.

f. Applicability of Merit Order Dispatch Principle

The Commission in the discussion paper has proposed that the wind power plants irrespective of plant capacity shall be treated as 'MUST RUN' power plants and shall not be subjected to 'merit order despatch' principles.

Suggestions of the Objectors

Some of the objectors requested that in case of back down, wind generation has to be treated as deemed generation and the deemed generation has to be purchased at applicable tariff. It is observed that in high wind seasons, wind power generators are facing generation loss due to back down given by DISCOMs.

Commission's Decision

The backing down instruction is subject matter of SLDC. Such instructions are given for grid management and to ensure secure and economic operations of the state grid. Such instructions of grid operator shall be followed by the wind generators and other entities in overall security of the grid. Therefore, at the time of backing down, the wind generation cannot be treated as deemed generation and no payment will be made by the distribution utilities for this generation. However, the wind power plants irrespective of plant capacity shall be treated as 'MUST RUN' power plants and shall not be subjected to 'merit order despatch' principles.

g. Metering point, grid connectivity and evacuation arrangement:

In the discussion paper, Commission has proposed that the metering point will be at the pooling sub-station at 66KV level and above located at wind farm site, whereas the interface point for the grid connectivity will be the nearest GETCO sub-station.

Suggestions of the Objectors

GUVNL requested to clarify that the delivery point for supply / injection of wind power in the grid shall be nearest GETCO sub-station and not at the pooling sub-station. Indian Wind Energy Association requested to consider the applicability of interface point on the EHV side of the pooling sub-station for enabling hassle free implementation of forecasting and scheduling (F&S) framework in the state. GETCO has proposed the metering and interface point as proposed by the Commission.

Commission's Decision

The Commission clarifies that the 'pooling sub-station' means a sub-station developed by the developer/generator where pooling of generation from individual WTG is done for interface with the receiving sub-station. The metering point and interface point as proposed were described in the earlier wind tariff order dated 08.08.2012 and arrangement worked well during the last control period and all stakeholders have supported the same. The Commission therefore defines the metering and interconnection points as given below:

Metering Point: The metering point will be at the 66 KV/132 KV/220 KV pooling sub-station located at the wind farm site. For the purpose of energy accounting the developer/generator would install ABT compliant meter at the metering point as defined above.

Interconnection Point: The interconnection point will be the point of connection at the nearest GETCO sub-station. In case of any dispute on interconnection point, provisions of the Grid Code shall prevail.

2.4.2 Operational and Financial Parameters

The following operational and financial parameters have been considered while determining wind power tariff under the cost-plus approach.

a. Capital cost

b. Capacity Utilization Factor (CUF)

c. Debt-Equity Ratio

d. Loan Tenure and Rate of Interest on Term Loan

e. Depreciation

f. Return on Equity

g. Operations & Maintenance Charges

h. Interest on Working Capital

i. Discount Rate

a. Capital Cost

Capital cost is the most critical component while determining tariff in a regulated environment. The capital cost of wind power projects comprise the cost of (i) tower and its base, (ii) turbine generators, (iii) blades, (iv) controllers, (v) power and control cabinets, (vi) distribution structure, (vii) transformer and associated equipment, (viii) land and its development cost, (ix) processing fee of Gujarat Energy Development Agency, (x) erection and commissioning charges, (xi) financing charges and interest during construction and (xi) creation of evacuation system up to the interconnection point .

In order to arrive at a benchmark capital cost for wind power projects to be commissioned in the new control period starting from the date of this order, the Commission has examined the wind power capital cost trends in the national and international markets during the last control period, the trend of commodity prices during the last control period, the wind power capital cost data of the projects commissioned in Gujarat during the control period of the GERC Wind Tariff Order dated 08.08.2012 as well as the approach followed by the Central Electricity Regulatory Commission (CERC) while fixing benchmark wind power capital cost under RE Tariff Regulations 2012. The cost incurred by the wind developers /investors for creation of power evacuation infrastructure during the last control period has also been examined as per the data provided by GETCO and factored in while deriving the capital cost.

On the basis of the above exercise, the Commission had proposed the benchmark capital cost of Rs 6.13 Cr/MW (including the power evacuation cost from wind farm sub-station to GETCO sub-station) for the new control period starting from date of this order.

Suggestions of the Objectors

Most of the objectors including the Wind Power Association/Wind Turbine Manufacturers/ developers have commented that the cost proposed in the discussion paper is on lower side. New wind turbines having 100 m or more hub height have cost implications. Indian Wind Power Association submitted that the amendment in the IEGC to implement forecasting and scheduling (F&S) related equipment and installation of Low Voltage Ride Through (LVRT) technology to all WTGs as mandated by the CEA have significant impact on the capital cost. Some of the objectors have suggested a higher capital cost benchmark in the range of Rs 6.5 Cr/MW to Rs 6.80 Cr/MW on the basis of present market conditions. Few objectors requested to consider the capital cost proposed by CERC i.e. Rs 6.19 Cr/MW plus additional evacuation cost of Rs 38 Lakh as considered in the previous tariff order.

GUVNL in their submission requested the Commission for lowering the capital cost from Rs 6.06 Cr/MW to Rs 5.84 Cr/MW in line with the approach followed by the MPERC in its tariff order for the year 2016.

Some of the stakeholders suggested to incorporate a suitable indexation formula for revision of capital cost during the control period or alternatively, adopt the capital cost indexation formula proposed by the CERC in its RE Tariff Regulations, 2012. Indian Wind Energy Association requested to determine each year tariff during the control period in line with the indexation formula specified by CERC.

Some of the stakeholders also requested to consider the impact of increase in service tax from 12.36% (as applicable at the time of previous wind tariff order) to 15% (as effective from 01.06.2016) in the capital cost.

Commission's Decision

The Commission has noted the points of the stakeholders regarding the capital cost of wind power projects for the new control period. In order to arrive at the capital cost benchmark for the new control period starting from the date of this order, the Commission has carried out its own exercise. The Commission has examined the wind power capital cost trends in the national and international markets during the last control period. The commodity (E&M and Steel) prices variation during the last control period was also examined. Under the Regulatory approach, the Commission has studied the capital cost benchmark fixed by CERC and other State Electricity Regulatory Commissions (SERCs) in their recent wind tariff orders. The annual growth rate of the capital cost fixed by the CERC from 2012 to 2016 has also been considered. The Commission has analyzed the wind power capital cost data of the projects commissioned in Gujarat during the last control period. The analysis was based on the state specific data submitted by IREDA (90.4 MW), and some of the Public Sector Undertakings (PSUs) who have installed wind power projects in the state (149.5 MW). The Commission has also verified the capital cost related data of the wind power project in the state registered with UNFCCC under Clean Development Mechanism (137.7 MW).

The cost incurred by the wind developers /investors for creation of power evacuation line /infrastructure from wind farm sub-station to GETCO sub-station during the last control period has also been examined as per the record provided by GETCO. Accordingly, the normative cost for laying of evacuation infrastructure has been fixed for the new control period.

The Commission has considered the submission of the stakeholders with regard to requirements for F&S and LVRT as per the guideline issued by CERC and CEA. The normative cost for the same has been included in the capital cost. The benchmark capital cost for the entire control period is derived by considering an appropriate escalation factor over the control period on the base cost.

In view of above, the Commission decides to adopt the benchmark capital cost of Rs 6.15 Cr/MW (including the power evacuation cost from wind farm sub-station to GETCO sub-station and the cost of F & S facilities including LVRT) for determination of tariff for the wind power projects to be commissioned in the control period starting from date of this order. The developer of wind power projects shall be responsible to construct the power evacuation line from wind farm switchyard to GETCO sub-station up to 100 km length without any additional cost. The cost on this account is already considered in the capital cost decided above.

b. Capacity Utilization Factor (CUF)

The Commission has elaborated the rationale for specifying the CUF of 24.5% in the discussion paper. The Commission had noted that the CUF at a given location would depend on (i) site specific parameters like wind velocity, wind density and Weibull parameters as well as (ii) machine specific parameters like hub height, rotor diameter, micro-sitting technique used and power curve of the machine. The state specific parameters and performance of WTG installed during the last control period have been analyzed while specifying the CUF for new control period.

The Commission noted that during the last control period (01.04.2012-31.12.2015), about 67.6% of the wind power projects (i.e. 639.45 MW out of 948.225 MW) commissioned in the state have used MW-class WTGs.

The Commission has examined the actual CUF achieved by the wind power projects installed during FY 2012-2013 to FY 2015-16 which have used MW-class WTGs in the state, and noted that the CUF of the wind power projects having MW class WTG commissioned in FY 2012-13 have achieved CUF in the range of 18.2% to 34.1% during 2013-14 and 2014-15 whereas the wind power projects commissioned in FY 2013-14 have achieved CUF in the range of 9.7% to 28.5% during FY 2014-15 and 2015-16.

The Indian Wind Atlas developed by NIWE in association with Riso DTU National Laboratory for Sustainable Energy (NLSE), Denmark shows most of the wind power potential areas in the state located under 200-350 W/m^2 wind power density zone at 100m hub height. The corresponding CUF, as given in the report, are in the range of 20% to 28%. In a Study Report prepared by Wind Force and CSTEP for Ministry of New and Renewable Energy in July 2015, the CUF of Gujarat State assessed as in between 25% to 40% and wind speeds range from 6 m/s to 9 m/s.

Suggestions of the Objectors

Most of the stakeholders suggested to specify the CUF at 24% or reducing it to 23% for the new control period. Inox Renewables Ltd and other few objectors suggested to not to consider the CUF on the basis of wind potential at 100 m height as very few generators are using machines of hub height of 100 m. Wind Independent Power Producers Association mentioned that out of 67 wind mast installed by NIWE in Gujarat, only in 12 locations the wind power density is more than 250 W/m^2 while for the remaining locations the wind power density is less than 250 W/m^{2}and therefore the normative CUF could be fixed at 23%.

GUVNL in their submission urged the Commission that the inefficiencies of the WTGs may not be allowed to pass through in the tariff by considering lower CUF in place of achievable CUF.GUVNL suggested to consider CUF of 26% based on a scientific study / analysis, accounting for the wind potential in the state and considering the long coast line in the state.

Some of the stakeholders suggested for specifying zone wise CUF based on average wind speed and zone-based tariff based on the zones as recommended by CERC under RE Tariff Regulations 2012.

Commission's Decision

NIWE has conducted the wind resource assessment studies at 81 locations in Gujarat at 20-120 m mast height. The 81 potential locations identified in the State are grouped into the seven groups of the wind power density at 100 m hub height. As evident from the map given in Indian Wind atlas corresponding to Gujarat state, the sites in Gujarat are having WPD of 200 – 350 W/m^2

and corresponding CUF varies from 20% - 28%. According to the study done by WinDForce and CSTEP, the CUF of Gujarat state ranges from 25% to 40% and wind speeds range from 6 to 9 m/s.

The Wind Power Density at preferred hub height will be a better indicator of CUF. In order to arrive at normative CUF, the Commission extensively studied the machine-specific and site/state specific characteristics for the state of Gujarat. The Commission observed that most of the wind projects commissioned in last control period have used MW scale WTGs. The Commission has analyzed the performance in terms of actual CUF achieved by the wind power projects installed during FY 2012-13 to FY 2015-16, which have used MW-class WTGs in the state.

The Commission has considered the time-span of the new control period starting from date of this order and the fact that with advancement in technology during the new control period the CUF of the new WTGs is bound to increase.

The Commission is of the view that the preferential tariff regime should encourage betterment in efficiency by deployment of better technology and techniques. The Commission has also to ensure that the consumers are not burdened with the tariff. The Commission does not find any reason to consider the suggestion of lowering of CUF, similarly suggestion of GUVNL to raise the CUF to 26% cannot be accepted without detailed reasoning for the same. In view of above the Commission decides to specify a normative CUF of 24.5% for determination of tariff during the new control period starting from date of this order.

c. Debt Equity Ratio

GERC Multi Year Tariff (MYT) Regulations, 2016 provide for the normative debt-equity ratio of 70:30 for Generating Company/Licensees. Clause 5.11 (b) of the Tariff Policy, 2016 notified by Government of India stipulates a debt-equity ratio of 70:30. Also, the CERC RE Regulations, 2012 have considered the same debt-equity ratio for wind power projects. The Commission proposed the debt equity ratio as 70:30 in the discussion paper as considered in the previous wind tariff orders.

Suggestions of the Objectors

M/s CLP Wind Farm (India) Pvt. Ltd has proposed that debt-equity ratio should be kept as 60:40.

Commission's Decision

The Tariff Policy, 2016 formulated by the Ministry of Power, Govt. of India stipulates debt-equity ratio of 70:30 for power projects. GERC Multi Year Tariff (MYT) Regulations, 2016 notified by the Commission also provide that the debt-equity ratio should be kept at 70:30. Hence, the

Commission decides to retain the debt-equity ratio as 70:30 for the new control period starting from date of this order.

d. Loan Tenure and Rate of Interest on Term Loan

The Commission in its earlier Wind Tariff Order dated 08 August 2012 stipulated loan tenure of 10 years. While considering the interest rate of loan, the Commission noted the trend of SBI base rate from February 2013 to February 2016 and observed that the current Base Rate of SBI is 9.3%. It has been noted that the base rate has been decreasing from April 2015. In view of this, the Commission had proposed to use the current base rate of SBI with a spread of 300 basis points above the current SBI base rate for fixing the interest on loan for tariff determination purpose.

Suggestions of the Objectors

Some of the stakeholders proposed to consider the SBI base rate for first six months plus 300 basis point for specifying interest rate for loan as per CERC regulations. Few stakeholders suggested to consider last one year weighted average base rate with spread of 300 basis point. One of the stakeholders suggested to consider the interest rate as 12.4%. GUVNL requested to consider interest rate at 11.8%, i.e. SBI base rate plus 250 basis point in line with GERC MYT Regulations, 2016.

Some stakeholders requested to consider loan tenure as 12 years in line with CERC regulations. One of the objectors suggested to consider loan tenure as 7 years.

Commission's Decision

The Commission has noted that the project financing interest rates are typically indicated by the SBI base rate. The Commission further noted that the SBI base rate has been reducing from April 2015. It has been noted that from October 2015, the SBI base rate is constant at 9.3%. Therefore, the Commission had considered current base rate of 9.3% while fixing the interest on term loan. The Commission decides to use the current base rate of SBI with a spread of 250 basis points above the current SBI base rate for fixing the interest on loan for the purpose of tariff determination. Regarding loan tenure, investors are not facing any problem of getting loan with tenure of 10 years, and the data collected from IREDA also substantiate this fact.

In view of above, the Commission decides to fix the normative interest rate on term loan as 11.8% and the loan tenure as 10 years for repayment of term loan for the purpose of tariff determination for the new control period starting from date of this order.

e. Depreciation

CERC (Terms and Conditions for Tariff Determination from Renewable Energy Sources) Regulations, 2012 considers the capital cost of the asset admitted by the Commission as value base for the purpose of determination of depreciation. Further, the salvage value of the asset is considered as 10% and depreciation is allowed up to a maximum of 90% of the capital cost of the asset. Depreciation per annum shall be based on ‘Differential Depreciation Approach’ over loan tenure. Beyond loan tenure the depreciation is allowed as per ‘Straight Line Method’ over remaining useful life of plant.

The Commission in its Wind Tariff Order dated 08 August 2012 had considered a higher rate of depreciation than the SLM as a promotional measure during the loan tenure. In view of the above, the Commission had proposed depreciation rate of 6% per annum for the first 10 years, and 2% from 11th year to 25th year for tariff determination purpose.

Suggestions of the Objectors

Most of the stakeholders suggested that the depreciation rate should be such that the annual depreciation can cover the annual loan repayment. The stakeholders requested to keep depreciation rate of 7% per annum during the first 10 years and the balance depreciation to be spread over the remaining useful life of the project. Some stakeholders suggested that considering 12 years loan tenure, the depreciation rate be considered as 5.83% as per CERC norms.

Commission’s Decision

GERC Multi Year Tariff (MYT) Regulations, 2016 notified by the Commission specifies that depreciation rate should be calculated based on the Straight Line Method. The MYT Regulations further lay down that asset is to be depreciated up to 90% of its initial value (considering residual value as 10% of its initial value) over the entire asset life. As requested by the stakeholders and to facilitate the loan repayment, the Commission has considered depreciation rate at 7% per annum during the loan repayment period of 10 years. The Commission decides to keep the depreciation rate as 7% per annum for the first 10 years and beyond loan tenure, the depreciation is allowed as per ‘Straight Line Method’ over remaining useful life of plant i.e. depreciation @ 1.33% from 11th year to 25th year for the purpose of tariff determination for new control period starting from date of this order.

f. Return on Equity (RoE)

The Commission in the discussion paper proposed 14% RoE. The GERC (Multi Year Tariff) Regulations, 2016, notified by the Commission provide norms for the RoE as 14% per annum. Also the tax payment in the form of MAT at the rate of 21.34% per annum for first 10 years and corporate tax at the rate of 34.61% per annum for the next 15 years has been considered as cost in tariff calculation as per earlier order of the Commission.

Suggestions from Objectors

Most of the objectors have suggested that the base RoE may be considered as 16%. Orange Renewable Power Pvt. Ltd submitted that the Commission should consider RoE of 17.8% for the first ten years and 21.41% for the next fifteen years. One of the objectors submitted that the RoE of 14% proposed by the Commission is less than that allowed to the thermal generators under CERC Regulations 2014. The CERC in its RE Regulations 2012 has considered pre-tax RoE of 20% for the first 10 years and 24% for the next 15 years. SITAC RE Pvt. Ltd proposed to consider RoE as 5%-6% more than bank's interest rate. Some objectors requested for grossing up of post-tax RoE as per applicable tax rate.

Some objectors requested that tariff is to be determined without considering the incentive under Section 80-IA of Income Tax Act which is valid till 31st March 2017. Adani Green Energy Ltd and CLP India submitted that the Commission should consider inclusion of enabling clause to review the post-tax regulated returns (RoE) on account of change in law / change in tax rates in future.

Commission's Decision:

GERC (Multi Year Tariff) Regulations, 2016 notified by the Commission specify the RoE of 14%; the same was specified by the Commission in its discussion paper. The Commission follows the principle of allowing 14% RoE plus the applicable tax payment for conventional and renewable power projects. The Commission decided to consider RoE of 14% and the tax payment of MAT at the rate of 21.34% per annum for first 10 years and corporate tax at the rate of 34.61% per annum for the next 15 years as a cost for the purpose of computing the tariff for the new control period starting from date of this order. In generic tariff determination approach, it is not possible to evaluate the impact of change in law at the time of tariff determination. In case of any changes in tax regime / rules during the control period, the Commission shall verify the same and take appropriate action.

g. Operations & Maintenance Charges

The Commission had, in its earlier wind tariff order dated 08 August 2012 considered the O&M expenses at Rs 8 Lakh/MW for the year 2012-13 with escalation of 5.72% from the second year onwards. In the discussion paper, the Commission had proposed the O&M charges of Rs 10.63 Lakh/MW, with annual escalation of 5.72% for the new control period starting from date of this order.

Suggestions from Objectors

Some of the objectors have suggested for increasing the base O&M cost to Rs. 10.88 Lakh / MW to Rs 11.24 Lakh/MW as per CERC Regulations. CLP India requested that if any charges have to be paid to GETCO for O&M of the line constructed from pooling sub-station to GETCO sub-station, that should also be added in the O&M cost. GUVNL submitted that considering the O&M cost of Rs 8 Lakh/MW during previous control period with annual escalation of 5.72% per annum, the O&M cost for the base year of new control period comes to Rs. 9.45 Lakh / MW, which should be considered for the purpose of tariff determination for the new control period. Adani Green Energy Pvt. Ltd. has requested to consider the escalation rate as 7%.

Some of the investors requested for considering the impact of change in service tax rate from 12.36% to present 15%.

Commission's Decision:

The Commission has carefully gone through the approach followed by the CERC and other SERCs while fixing the O&M cost for the purpose of wind power tariff determination. The O&M cost of Rs. 8 Lakh/MW considered by the Commission in its wind tariff order dated 08 August 2012, if escalated by 5.72% annually, comes to Rs. 9.90 Lakh/MW for FY 2016-17 and accordingly, the Commission decides to fix the O&M cost at Rs. 9.90 Lakh/MW. Further, as per the provisions of the GERC (MYT) Regulations 2016, the Commission decides to fix the annual O&M escalation at the rate of 5.72% over the tariff period in the new control period starting from date of this tariff order.

h. Working Capital and Interest on Working Capital

The Commission in its Wind Tariff Order dated 08 August 2012, had considered the interest rate on working capital at 12% which was 200 basis points above the prevalent to SBI base rate.

In the discussion paper, the Commission had considered interest on working capital as 200 basis points over the current SBI base equal to 11.30%. Similarly, the Commission has proposed (i) Receivable of one month and (ii) O&M cost for one month as components of working capital.

Suggestions from Objectors

Some objectors have proposed to consider interest on working capital 50 basis point higher than the interest on long term loan. Few objectors suggested to consider the interest on working capital as SBI base rate for first six months of last financial year plus 350 basis point as per CERC Regulations. Some of the objectors suggested interest on working capital in the range of 11.78% - 13.5%.

One of the objectors requested to align the working capital with the conventional generation Tariff Regulations; thereby allowing maintenance spares as part of working capital @ 15% of O&M costs. Ostro Energy Pvt. Ltd suggested to consider 3 months of O&M expenses in the working capital.

Commission's Decision

As per the GERC (MYT) Regulations, 2016 interest on working capital shall be allowed at a rate equal to the SBI Base Rate plus 250 basis points. The Commission noted that the working capital requirement by the project developer would be generally on short term basis which can be managed at lower interest rate.

In view of above, the Commission decides to consider the interest rate on working capital as 11.8% (current SBI base rate of 9.3% + 250 basis point) for the purpose of tariff determination of wind power projects during new control period starting from the date of this order.

The Commission also decides to keep the components of working capital as decided in the previous wind tariff order. Accordingly, the components of working capital would be (i) Receivables of one month and (ii) O&M cost for one month.

i. Discount Rate

The Commission in the discussion paper had calculated the annual levellized tariff based on the discount rate of 10.29%. As per the standard methodology followed by CERC and other SERCs, the discount rate is proposed as weighted average cost of capital (WACC) for the purpose of levellized tariff calculation.

Suggestions from Objectors:

One of the objectors requested to consider pre-tax WACC for each year as discount rate for that year.

Commission's Decision

CERC (terms and conditions for Tariff determination from Renewable Energy Sources) Regulations, 2012 has recommended post tax weighted average cost of capital (WACC) as discount rate for determination of levellized tariff. Generally, the developer applies post tax WACC as the discount rate to post tax incremental cash flows to arrive at NPV of the project. WACC is the addition of cost of debt and cost of equity. The cost of debt is calculated based on market interest rate, MAT and corporate tax rate, while the cost of the equity is calculated based on the return on equity. The computation of WACC is given below considering the interest rate finalized in the para 2.4.2 (d).

WACC = Cost of Debt + Cost of Equity
Where, Cost of Debt (For first 10 Years) =0.70 x (Market Rate of Interest) x (1- MAT)
Cost of Debt (11th Year to 25th Year) =0.70 x (Market Rate of Interest) x (1- Corporate tax)
Cost of Equity = 0.30 x Return on Equity (i.e. 14%)
Resulting WACC = {(WACC for first 10 Years X 10) + (WACC 11th Year to 25th Year X 15)}/(10 + 15)
Cost of Debt (For first 10 Years) = 0.70 x 11.8% x (1- 21.34%) = 6.5%
Cost of Debt (11th Year to 25th Year) = 0.70 x 11.8% x (1- 34.61%) = 5.4%
Cost of Equity = 0.30 x 14% = 4.2%
WACC for first 10 Years = 10.70% and WACC 11th Year to 25th Year = 9.6%
Resulting WACC = 10.04%
In view of the above calculation, the Commission decides to specify the discount rate as 10.04% for the purpose of computation of the levellized tariff over the life of 25 years.

2.4.3 Subsidy and Incentive by the Central/State Government

Benefit due to Accelerated Depreciation: The Commission noted that the wind power project developers can avail benefit of Accelerated Depreciation as per Section 32 of the Income Tax Act read with the Rules framed there under. In addition to above, the wind power project developers can claim an additional depreciation of 20% during the first year of commissioning of the project as per the Finance Act. In the discussion paper, the Commission has proposed 40% accelerated depreciation as per the announcement in Budget Speech made by Hon Finance Minister. In totality 60% depreciation in the first year of commissioning of project was considered.

Suggestions from Objectors:

Some of the objectors have suggested that two separate tariffs with and without Accelerated Depreciation benefit may be specified, since the IPPs may not be in a position to avail the accelerated depreciation benefit. Further the objectors requested Commission to direct GUVNL/ distribution licensee to procure electricity at such tariff specified by the Commission. Few objectors requested to compare the accelerated depreciation (as per IT Act, 1961) with tax depreciation i.e. 7.69% while calculating the impact of accelerated depreciation benefit. ReGen Power Tech Pvt. Ltd suggested to consider the reduced rate of depreciation (40%) from FY 2017-18. Indian Wind Power Association requested that the Commission may incorporate a clause in the Tariff Order which explicitly pronounces that a Distribution Licensee cannot reject the signing of PPA irrespective of developer's stance to avail AD benefit or not, if it is yet to fulfill its RPO targets.

Commission's Decision

The Commission has noted that the provisions of Accelerated Depreciation are available in the Income Tax Act 1961 and Rules framed there under. A person who qualifies under the above statutory provisions is entitled to get benefit of Accelerated Depreciation. Moreover, that Income Tax Act would not make any discrimination between the tax payers / investors, everyone is allowed to avail the benefit as per provisions under Income Tax Act. Under Cost plus approach the tariff is determined upon normative cost and performance parameters. In view of the fact that the Commission has allowed all reasonable cost and returns to be recovered from the tariff, it is fair that any benefit occurring due to subsidy / accelerated depreciation would be factored in while determining the tariff. Hence the Commission decides to determine a single levellized tariff taking into account the benefit of accelerated depreciation available under Income Tax Act 1961 and Rules framed under it.

The Commission has reviewed the present accelerated depreciation rate under Income Tax Act 1961 and Rules framed under it and an additional depreciation available in the first year of commissioning as per Finance Act. The Commission noted that at present the wind developer /investor can avail 80% depreciation under Income Tax Act 1961 with an additional 20% depreciation as allowed in Finance Act during first year of project commissioning. Following method has been adopted to calculate the per unit benefit available due to accelerated depreciation.

a. The assessment of benefit shall be based on normative Capital Cost, accelerated and additional depreciation rate as per the relevant provisions of the Income Tax Act and the Corporate Income Tax rate;
b. Capitalization of RE Projects for the full financial year;
c. Per unit benefit shall be derived on levellized basis at a discounting rate equivalent to the post-tax weighted average cost of capital as determined above.

In view of above, the Commission decides to specify a single generic levellized tariff after factoring the benefit of accelerated depreciation for the new control period starting from date of this order. In case of any changes in tax regime / rules during the control period, the Commission shall verify the same and determine tariff at appropriate time in accordance with the law.

Benefit due to Generation based Incentive: The Commission noted that the Generation based Incentive (GBI) scheme is re-introduced by Ministry of New and Renewable Energy (MNRE), Government of India with effect from 04 September 2013. Under this scheme, a GBI is offered to wind energy generators at Rs 0.50 per kWh of electricity fed into the grid for a period not less than 4 years and a maximum period of 10 years with a cap of Rs 100 Lakh / MW. The total disbursement in a year was limited to one fourth of the maximum limit of the incentive i.e. Rs. 25 Lakh / MW during the first four years. The GBI scheme as per present guidelines will be continued till end of 12th Plan period. The Commission in the discussion paper proposed that the GBI incentive which is available to the developer/investor over and above the tariff shall be shared with the distribution licensee / end consumer in equal proportion i.e. 50-50% basis.

Suggestions from Objectors:

Most of the objectors suggested to not to share GBI as it is over and above the tariff. The proposal of the MNRE is to promote wind power and hence proposal of sharing of GBI is not in consonance with MNRE objectives. Some of the objectors including GUVNL suggested that some companies which cannot avail accelerated depreciation benefit should be allowed to avail GBI fully and proposal of sharing of the same should be withdrawn. Few objectors suggested that no other states have adopted a strategy to share this incentive. Some objectors opined that GBI is an incentive component for IPPs, whereas levellized tariff, applicable for all projects, is net of AD benefits; hence, sharing of GBI is double deterrent for IPP projects.

Commission's Decision

The Commission has noted the concerns of the stakeholders. The Commission noted that the GBI operational guidelines notified by MNRE / IREDA specifies that the GBI incentive is over and above the tariff approved by the SERCs in the various state. The Commission has followed cost plus approach for arriving at tariff for sale of electricity generated from wind power projects to the distribution licensees during the new control period. The single levellised tariff has been specified after taking into account the benefit due to AD available to wind power projects. In view of above, the Commission decides that GBI will not be shared with distribution utilities and end consumers. The wind power developer /investor who are eligible to claim GBI as per MNRE guidelines can retain the incentive over and above the tariff determined by the Commission in this order.

3. Tariff Determination

Based on the foregoing discussion, various operational and financial parameters considered by the Commission for determination of wind power tariff are given in the table below:

Parameters for the new control period	
Project Cost	
Capital Cost including Land, Plant & Machinery, F & S facilities, LVRT, Erection and evacuation infrastructure cost (Rs Lakh/MW)	615
Normative O&M cost for first year (Rs Lakh/MW)	9.90
Escalation in O & M (per annum from 2nd year)	5.72%
Performance Parameters	
CUF	24.5%
Project life in Years	25
Financial Parameters	
Debt-Equity ratio	70:30
Term of Loan in Years	10
Interest on Term Loan	11.80%
Interest on Working Capital	11.80%
Depreciation	7% (for the first 10 years) 1.33% (from 11 to 25 years)

Parameters for the new control period	
Return on Equity	14%
Minimum Alternate Tax	21.34%
Corporate Income Tax	34.61%
Discount rate	10.04%
Gross Tariff	Rs 4.72 per kWh
Depreciation Benefit	Rs 0.53 per kWh
Net Tariff	Rs 4.19 per kWh

The net tariff determined by the Commission is **Rs 4.19/kWh** payable by the distribution licensees to wind turbine generators which are installed and commissioned during the control period of this order for which the PPAs shall be signed by the distribution licensees with the Wind Turbine Generators.

4. Other Commercial Issues

4.1 Transmission and Wheeling Charges

The Commission in its discussion paper had specified the Open access charges and losses for wheeling wind energy for captive use and third-party sale during the new control period. Wheeling of Power for third-party sale from wind energy generator was proposed on payment of normal open access charges and losses along with payment of 25% of the cross subsidy surcharge as applicable to normal open access consumer. For captive transaction, wheeling of power to consumption site at 66 kV voltage level and above was proposed on payment of normal open access charges and losses, whereas wheeling of power to consumption site below 66 kV voltage level was proposed on the basis of concessional wheeling charges and wheeling losses.

In the discussion paper, it was proposed that wind energy generators, who decide to wheel electricity for captive use / third-party sale, to more than one location, shall pay 5 paisa/kWh on energy fed into the grid to the distribution company concerned in whose area power is consumed in addition to above mentioned transmission charges and losses, as applicable.

Suggestions from Objectors

Some of the objectors requested to withdraw the proposal of levy of CSS. The objectors further submitted that the Commission has waived levy of CSS on third-party sale in case of Solar power and hence similar dispensation should be allowed to wind energy. One of the objectors suggested that in case of third-party sale wheeling charges shall be allowed at 25% of normal OA charges. One of the objectors suggested to reduce the OA charges to zero. Indian Wind Energy Association requested that as Ministry of Power under Tariff Policy waived off the transmission charges in case of inter-state transaction of RE power, similar relaxation can be given at intra-state level by the GERC. Alternatively, charges may be specified in per kWh basis. One of the objectors requested to exempt wheeling and transmission charges for a period of ten years while another objector requested for exemption as per 2012 wind order.

GUVNL requested to keep OA charges as specified in the Gujarat Solar Policy 2015. Torrent Power Ltd suggested that WEG opting for captive use should be treated at par with other open access consumers. Torrent Power Ltd requested that for third part sale all charges including CSS should be applicable like normal open access transaction as it is a commercial proposition.

Commission's Decision

The transmission lines are designed so as to carry the rated connected capacity of wind energy generator and therefore cost of transmission / distribution assets created for such projects is required to be recovered through the transmission and wheeling charges.

The third-party sale through open access is a commercial decision of the generator. Whenever any WTG sells the electricity under Third Party Sale, he shall be liable to pay transmission and wheeling charges and other charges as stated below:

(i) Wheeling of power for third party from Wind Energy Generator shall be allowed on payment of transmission charges, wheeling charges & losses of energy fed to the grid, as applicable to normal open access consumers. Set off of wheeled energy at recipient unit(s) shall be carried out in the same 15-minute time block.

(ii) Further, Wind Energy Generators who desire to wheel electricity to more than one location, shall pay 5 paise per unit on energy fed in the grid to the Distribution Company concerned in whose areas power is consumed in addition to above mentioned transmission/wheeling charges and losses, as applicable.

(iii) 50% of Cross Subsidy Surcharge and Additional Surcharge, as applicable to normal open access consumers.

However, in case of the wind energy generators opting for wheeling of power for own use, the Commission decides to allow lower transmission / wheeling charges. Accordingly, the transmission and wheeling charges applicable to the captive consumers shall be as under:

a) **Wheeling of power to consumption site at 66 kV voltage level and above**: The wheeling of electricity generated from the Wind Energy Generators, to the desired location(s) within the State, shall be allowed on payment of transmission charges and transmission losses applicable to normal Open Access Consumer.
b) **Wheeling of power to consumption site below 66 KV voltage level:** In case the injection of power is at 66 kV or above and drawl is at below 66 kV , wheeling of electricity generated from wind power projects to the desired location(s) within the State, shall be allowed on payment of transmission charges and transmission losses applicable to normal open access consumers and 50% of wheeling charges and 50% of distribution losses of the energy fed into the grid as applicable to normal open access consumers.
c) **Wheeling of electricity generated by small investor, having only one WEG in the State**, to the desired location(s), shall be allowed on payment of transmission charges applicable to normal open access consumer, and transmission and wheeling losses @ 10% of the energy fed to the grid. The above losses are to be shared between the transmission and distribution licensee in the ratio of 4:6.

Further, the Commission decides that wind energy generators, who desires to wheel electricity for captive use / third-party sale, to more than one locations, he shall pay 5 Paise per unit on energy fed in the grid to the Distribution Company concerned in whose area power is consumed in addition to the above mentioned transmission charges and losses, as applicable.

4.2 State Energy Metering

In the discussion paper it was proposed to keep the wind energy generators out of the purview of state intra-state ABT. However, for the purpose of energy accounting, such projects will have to provide ABT compliant meters at the interface point. The metering shall conform to the Central Electricity Authority (Installation and Operation of Meters) Regulations, 2006, as amended from time to time. The electricity generated from the wind power generator shall be metered and readings shall be taken jointly by the wind power project developer with the Gujarat Energy Development Agency (GEDA), Gujarat Energy Transmission Company Ltd. (GETCO) or Distribution Company at the metering point.

Suggestions from Objectors

GETCO suggested that interface point for metering with GETCO is the HV side of the transformer or outgoing line from pooling sub-station. GETCO and GEDA will jointly take the reading. However, below 66 kV, i.e. when meters are installed at each WTG, the reading from such individual meters will be through remote access and will be received at SLDC/ ALDC/ DISCOM / GEDA. Joint meter reading will not be required for such individual meters.

Commission's Decision:

The Commission has defined the interconnection point and metering point in para 2.4.1 (g) of this order. The Commission directs that wind power project developers should install ABT compliant meters at the pooling substation. The ABT meter shall conform to the Central Electricity Authority (Installation and Operation of Meters) Regulations, 2006, as amended from time to time. The project developers will have to install Remote Terminal Unit (RTU) for transferring the real time data to SLDC for its monitoring purpose. Further, the Commission has clarified through its order dated 07.01.2013 that installation of ABT compliant energy meter at each WTG is necessary so as to evaluate the generation of each WTG on real time basis.

The electricity generated from the wind power generator shall be metered and readings shall be taken jointly by the wind power project developer with the Gujarat Energy Development Agency (GEDA), Gujarat Energy Transmission Company Ltd. (GETCO) or Distribution Company at the metering point.

4.3 Pricing of Reactive Power

Some of the wind energy generators require reactive power during initial start-up and their station transformers also continuously require reactive power from the grid. Hence, in order to maintain grid stability, it is necessary to limit such reactive power consumption from the grid by installation of suitable compensation devices. In order to restrain the wind power projects from consuming more reactive power from the grid and to encourage them to install suitable compensation devices to limit such reactive power consumption, the Commission in its discussion paper had proposed to continue the levy of reactive power charges as specified in its Wind Tariff Order dated 08.08.2012.

Suggestions from Objectors

GETCO suggested to revise the rate of reactive energy charges and proposed the rate as 25 paisa /kVARh for drawl of reactive energy at 10% or less of the net energy exported and 50 paisa /kVARh for drawl of reactive energy at more than 10% of the net active energy exported.

Commission's Decision

The Commission has noted that due to its inherent characteristics the Wind Energy Generators are prone to draw reactive power from the grid. In order to ensure that only a minimum reactive energy is drawn by WTGs from the grid the Commission decides the rate of the reactive energy charges for wind power projects as follows:

"10 paise/kVARh – For the drawl of reactive energy at 10% or less of the net energy exported.

50 paise/kVARh – For the drawl of reactive energy at more than 10% of the net active energy exported".

Any change in the reactive energy charges for wind power projects if addressed in the Commission's transmission tariff order effective from time to time shall be made applicable to wind power projects

4.4 Sharing of Clean Development Mechanism (CDM) Benefits

In the discussion paper, it was proposed to retain the provisions for sharing of CDM benefits as specified in Commission's Wind Tariff Order dated 08.08.2012 as per the provisions given in the CERC (Terms and Conditions for Tariff determination from Renewable Energy Sources) Regulations, 2012 dated 6th February 2012 for the next control period. The provisions proposed as follows:

"100% of net proceeds through sale of CER generated from the energy generation in the first year after the date of commercial operation of the wind power project shall be retained by the wind power generating company.

In the second year, the share of the beneficiary shall be 10% which shall be progressively increased by 10% every year till it reaches 50% in the sixth year; thereafter the proceeds shall be shared in equal proportion by the wind power generating company and the beneficiary"

Suggestions from Objectors

Some of the objectors had proposed that the investors should be allowed to retain 100% CDM benefits considering the huge risks and upfront expenditure involved. It was also pointed out that there is a wide gap in the date of project commissioning, date of CDM project registration with UNFCCC, issuance of CER and the actual receipt of money after trading of CERs due to the various processes involved in the CDM project registration. The objectors proposed that the sharing of net CDM revenue should be allowed after CDM project registration and payable after realization.

Commission's Decision

Considering the high initial cost of registering CDM projects, and the long time taken to realize the CDM benefits and the operational issues, the Commission decides that the sharing of net proceeds on account of CDM benefits realized through sale of CER generated from corresponding annual energy generation should be as follows:

- 100% of net proceeds through sale of CER generated from the energy generation in the first year after the date of commercial operation of the wind power project shall be retained by the wind power generating company.

- In the second year, the share of the beneficiary shall be 10% which shall be progressively increased by 10% every year till it reaches 50% in the sixth year; thereafter the proceeds shall be shared in equal proportion by the wind power generating company and the beneficiary.

Wind power projects availing CDM benefit shall share the net CDM proceeds annually as per above, by 31 March of every year with affidavit stating the annual energy generation (date of commissioning as starting point of the first year), CER generated, gross receipts, and net receipts, etc.

4.5 Banking of Surplus Wind Energy

In the discussion paper, considering the infirm nature of wind, as well as seeing the possible risk to utilities in changing electricity rates throughout the year in the intra-state ABT regime provision of one-month banking was proposed for captive wind power projects not registered under REC mechanism. The captive wind energy projects were allowed to set off captive consumption against the monthly energy generated during peak and normal hours. However, considering the fact that the intra-state ABT and DSM mechanism has been adopted in the state, banking of energy for limited period also have financial implication on utility. To protect the interest of utility, it was proposed to levy Banking charges in kind at 2% of energy banked. Banking facility was not proposed in the discussion paper for third-party sale of wind energy.

Suggestions from Objectors

Some of the objectors have proposed to allow the banking facility for third-party sale also. Some of the objectors requested that for encouraging sale of captive power duration of banking period may be increased to 3 - 12 months. One of the objectors requested for clarity on applicability of banking charges in existing wind farms. Few objectors requested to remove banking charges on energy banked as there will be additional burden over 13 paisa per unit on the wind energy generated.

Torrent Power Ltd requested the Commission to discontinue the banking facility for captive wind power projects as this is a commercial proposition and requested to treat them at par with other open access consumers in order to reduce the burden on the other consumers.

Commission's Decision

Considering the intermittent generation pattern of wind power projects and as a promotional measure the Commission decides to continue the present practice of settlement of excess generation after set off during one billing cycle in case of captive wind power projects in the state. With intra-state ABT mechanism in place in the state, increase in time period for banking will have adverse financial impact on utilities. As a promotional measure, the captive WEGs not registered under REC are eligible for one month banking for the electricity generated during the same calendar month. The Commission decides to continue the present practice of settlement on the basis of peak and normal hours as specified in Commission's order. However, they are eligible to utilize the same during the billing cycle (1 month) in the proportion to the energy generated during peak and normal hour period. The Commission decides that the banking facility shall not be available for third-party sale of wind energy and set off will be done in the 15 minute time block with open access consumer's consumption.

Considering the fact that the intra-State ABT and DSM mechanism has been adopted in the State, banking of energy for limited period also have financial impact on utility. Therefore, the Commission decides to levy banking charges in kind. Banking charges shall be adjusted in kind at 2% of energy banked.

4.6 Purchase of Surplus Power from Wind Power Projects opting for Captive use and Third Party Sale under Open Access.

In the discussion paper, it was proposed that in case of captive use of wind power (non-REC projects), the surplus power after one month's banking be purchased by the distribution licensee at the rate of 85% of the feed-in tariff declared by the Commission. Also, in case of third-party sale of wind power (non-REC projects), the surplus power available after set off with open access consumer's consumption in the same 15 minute time block was proposed to be sold to the distribution licensee concerned at the rate of 85% of the feed-in tariff declared by the Commission.

Suggestions from Objectors

GUVNL submitted to purchase surplus power at APPC only and can be considered for fulfilling the RPO.

Commission's Decision

Quantum of surplus power available after setting off under captive use or third-party sale is uncertain and this could lead to uncertainty in planning for utilities for utilization of the same. Further, linking the tariff for purchase of surplus power with the fulfilment of utilities RPO will lead to implementation issues, and hence, the Commission decides not to link the same with the RPO.

The Commission clarifies that in case of wind power projects availing OA for captive use / third-party sale but not opting for REC, the surplus power after set off will be purchased by the distribution licensee at the rate of the Average Pooled Power Purchase Cost (APPC) of the year of the commissioning of the project as determined by the Commission.

4.7 Renewable Energy Certificates for Third-Party Sale and Captive Use of Wind Energy

In the discussion paper, it was proposed that the power generated from wind power projects if wheeled to third-party or for captive use will be eligible for availing the Renewable Energy Certificates as per the qualifications criteria given in CERC (REC) Regulations and its subsequent amendments. Further, for such projects surplus power available after set off will be purchased by the distribution licensee at APPC applicable for that year.

Suggestions from Objectors

GUVNL has submitted that CERC has modified the eligibility criteria through amendment dated 30.03.2016 and hence captive generators are not eligible for RECs. Another utility requested to specify the APPC rate and sought clarification whether applicable rate would be APPC rate of that particular year in which the project is commissioned.

Commission's Decision

The Commission has specified the concessional treatment available to the captive and third-party wind power projects. However, the captive and third-party wind energy projects for registering under the REC mechanism, in case they avail any concessional benefits are governed by the CERC REC Regulations and its amendments thereof and the same shall also be applicable to the wind projects commissioned in Gujarat.

Regarding banking for captive projects registered under REC, the Commission had clarified the issue through its order dated 07.01.2013. Under the Intra-State ABT implemented in the State of Gujarat from 05.04.2010, banking facility is not permissible to the CPP holders who set up the WTG under REC schemes. The WTGs registered under REC are entitled to set-off in 15 minutes' time block only.

In case of wind power projects availing OA for captive use / third-party sale and opting for REC, the surplus power after set off will be purchased by the distribution licensee at 85% of Average power procurement cost (APPC) of the year of commissioning of the project as determined by the Commission, which will remain unchanged throughout the life of plant. The APPC rate for the state will be determined by the Commission separately after receiving the data from utilities in this regard. The present practice of settlement of excess generation after set off in case of wind power projects availing OA for captive use / third- party sale will remain unchanged. The CGP set-up under REC mode and energy generated from it for sell to third party shall be liable to pay cross- subsidy surcharge of relevant year as decided by the Commission. Further such consumer shall also be liable to pay the additional surcharge over and above cross-subsidy surcharge.

4.8 Security Deposit

In order to assure GETCO about seriousness of project developer towards commissioning of the wind projects, the project developers are required to furnish bank guarantee of Rs 5 Lakh/MW as a security deposit to GETCO. In the discussion paper, it was proposed that, the time period for completion of the project capacities will be as recommended by the Commission in the earlier wind tariff order dated 08.08.2012. In case of delay in project commissioning beyond the prescribed period due to unforeseen reasons, GETCO may issue extensions on case-to-case basis.

Suggestions from Objectors

GUVNL requested to incorporate a provision of submission of bank guarantee / security deposit of Rs. 25 Lakh/MW at the time of signing of PPA with distribution licensee to demonstrate the sincerity in development of power project and to deliver power to power procurer as per the terms and conditions of PPA.

Commission's Decision

The Commission recognizes the fact that the wind energy generators have to show their commitments for utilization of infrastructure created by GETCO. As such, the Commission decides to retain the provision regarding furnishing of Bank Guarantee of Rs 5 Lakh/MW by the project developers to GETCO. With regard to submission of GUVNL, the Commission feels that it will result into increase in the expenses and hence GUVNL's request is not considered. Time periods allowed to the developers to complete their projects will be as under:

MW	Period for commissioning the entire capacity
1 MW to 100 MW	1.5 years from the date of allotment of transmission capacity
101 MW to 200 MW	2 years from the date of allotment of transmission capacity
201 MW to 400 MW	2.5 years from the date of allotment of transmission capacity
401 MW to 600 MW	3.5 years from the date of allotment of transmission capacity

The bank guarantee shall be encashed by GETCO if the project is not commissioned within a specified time period as given above,

Provided further that the developer shall commission at least 10% of the allotted capacity within one month of charging of the evacuation line. Failing this, the developer shall be liable to pay long term transmission charges for 10% of allotted capacity till such 10% of allotted capacity is commissioned.

In case of delay in commissioning of the project beyond the prescribed time period due to unforeseen reasons beyond the control of the project developer, the developer may approach GETCO for time limit extension approval.

4.9 Other Issues

(i) Energy Accounting of Renewable Energy Attribute by the Wind Turbine Generators:

a) In case the consumer does not take renewable attribute for meeting its RPO, energy generated by wind power project shall be set off against the consumption during the consumers billing cycle. Surplus power after giving set off shall be purchased by DISCOM at APPC of the year of commissioning of project and entire generation shall be credited to DISCOM's account for meeting RPO.

b) In case the consumer takes renewable attribute of wind energy for meeting its RPO, energy accounting shall be based on 15 minutes' time block. Surplus power after giving set off shall be purchased by DISCOM at APPC of the year of commissioning of project. Surplus wind energy purchased by DISCOM shall be considered for meeting RPO of DISCOM.

(ii) Commissioning of WTG

Commissioning of WTG shall be done by the WTG owners in the presence of the representatives of the WTG, GEDA and the concerned distribution licensee in whose area the power is purchased by the licensee. Same procedure is applicable for WTGs set up for captive use and third party sale. The Commissioning certificate containing a confirmation about installation of ABT complaint meter must be signed by GEDA, DISCOM and WTG representatives. GEDA shall confirm that WTG owner has installed necessary equipments for scheduling and forecasting of the wind energy at WTG.

5. Applicability of the Order

Suggestions from Objectors

GUVNL requested that the Commission may specifically mention that the new tariff and terms & conditions shall be applicable to those projects for which PPA will be signed and project will be commissioned subsequent to the effective date of new tariff order.

Commission's Decision

The Commission decides that this order shall come into force from the date of issue of this order. Therefore, the tariff and other commercial terms as determined by the Commission in this order shall be applicable to all such wind energy generators for which the PPAs would be signed in respect of WTGs to be installed and commissioned on or after the date of this order.

Sd/-	**Sd/-**	**Sd/-**
[P.J. THAKKAR]	**[K.M. SHRINGARPURE]**	**[ANAND KUMAR]**
MEMBER	**MEMBER**	**CHAIRMAN**

Place: Gandhinagar
Date: 30/08/2016

Annexure I

List of Stakeholders who have submitted written suggestions/objections on the Discussion Paper.

Sr. No	Name of Stakeholder
1	Adani Green Energy Limited
2	Powerica Limited
3	Wind Independent Power Producers Association (WIPPA)
4	Sembcorp Green Infra Limited
5	INOX Renewables Limited
6	GUVNL
7	SITAC
8	Re-Gen Power Tec Limited
9	Indian Wind Energy Association
10	Surat Municipal Corporation
11	Indian Wind Power Association
12	Ostro Energy Private Limited
13	BLP Energy Private Limited
14	GETCO
15	IL&FS energy development company Ltd.
16	Torrent Power Ltd.
17	Orange Renewable Power Pvt. Ltd.
18	CLP Wind Farms (India) Pvt. Ltd.
19	Gujarat Flurochemicals Limited
20	Indian Wind Turbine Manufacturers Association
21	Gujarat Wind Farms Limited
22	Energy & Petrochemicals Department
23	General Electric
24	Gujarat Industries Power Companies Ltd.

Annexure II

List of stakeholders, who have attended the public hearing on 20 June 2016.

Sr. No	Name of Stakeholder
1	Adani Green Energy Limited
2	Powerica Limited
3	Wind Independent Power Producers Association (WIPPA)
4	Sembcorp Green Infra Limited
5	INOX Renewables Limited
6	GUVNL
7	SITAC
8	Re-Gen Power Tec Limited
9	Indian Wind Energy Association
10	Surat Municipal Corporation
11	Indian Wind Power Association
12	GETCO
13	Torrent Power Ltd.
14	Orange Renewable Power Pvt. Ltd.
15	Gujarat Energy Development Agency
16	Madhya Gujarat Vij Company Limited
17	Continuum Wind

Annexure III

Tariff Sheet

Tariff Calculations																									
Year	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
Net Energy sold (lakh kWhs)	21.46	21.46	21.46	21.46	21.46	21.46	21.46	21.46	21.46	21.46	21.46	21.46	21.46	21.46	21.46	21.46	21.46	21.46	21.46	21.46	21.46	21.46	21.46	21.46	21.46
Costs																									
O&M	9.90	10.47	11.06	11.70	12.37	13.07	13.82	14.61	15.45	16.33	17.27	18.25	19.30	20.40	21.57	22.80	24.11	25.49	26.94	28.49	30.11	31.84	33.66	35.58	37.62
Depreciation (SLM)	43.05	43.05	43.05	43.05	43.05	43.05	43.05	43.05	43.05	43.05	8.20	8.20	8.20	8.20	8.20	8.20	8.20	8.20	8.20	8.20	8.20	8.20	8.20	8.20	8.20
Interest on term loan	48.26	43.18	38.10	33.02	27.94	22.86	17.78	12.70	7.62	2.54	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Interest on working capital	1.42	1.38	1.34	1.31	1.27	1.23	1.20	1.16	1.13	1.10	0.78	0.80	0.82	0.84	0.86	0.89	0.91	0.94	0.97	1.00	1.03	1.07	1.10	1.14	1.18
Return on Equity	25.83	25.83	25.83	25.83	25.83	25.83	25.83	25.83	25.83	25.83	25.83	25.83	25.83	25.83	25.83	25.83	25.83	25.83	25.83	25.83	25.83	25.83	25.83	25.83	25.83
Tax on equity	5.51	5.51	5.51	5.51	5.51	5.51	5.51	5.51	5.51	5.51	8.94	8.94	8.94	8.94	8.94	8.94	8.94	8.94	8.94	8.94	8.94	8.94	8.94	8.94	8.94
Total Cost (Rs lakh)	**133.97**	**129.42**	**124.90**	**120.42**	**115.97**	**111.56**	**107.19**	**102.87**	**98.59**	**94.36**	**61.01**	**62.02**	**63.08**	**64.21**	**65.40**	**66.66**	**67.99**	**69.40**	**70.88**	**72.46**	**74.12**	**75.87**	**77.73**	**79.70**	**81.77**
Tariff (Rs/kWh)	6.24	6.03	5.82	5.61	5.40	5.20	4.99	4.79	4.59	4.40	2.84	2.89	2.94	2.99	3.05	3.11	3.17	3.23	3.30	3.38	3.45	3.54	3.62	3.71	3.81

Levelized Fixed Tariff Calculations	
Discount Rate	10.04%
Levelized Fixed Tariff (Rs / kWh)	**4.72**

Depreciation Benefit Calculations

Year	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
Amount of book depreciation (Rs lakh)	32.47	32.47	32.47	32.47	32.47	32.47	32.47	32.47	32.47	32.47	32.47	32.47	32.47	32.47	32.47	32.47	32.47	1.48	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Amount of accelerated depreciation (Rs lakh)	615.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Net depreciation benefit (Rs lakh)	582.53	-32.47	-32.47	-32.47	-32.47	-32.47	-32.47	-32.47	-32.47	-32.47	-32.47	-32.47	-32.47	-32.47	-32.47	-32.47	-32.47	-1.48	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tax Benefit (Rs lakh)	201.61	-11.24	-11.24	-11.24	-11.24	-11.24	-11.24	-11.24	-11.24	-11.24	-11.24	-11.24	-11.24	-11.24	-11.24	-11.24	-11.24	-0.51	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Net energy Generation (lakh Units)	21.46	21.46	21.46	21.46	21.46	21.46	21.46	21.46	21.46	21.46	21.46	21.46	21.46	21.46	21.46	21.46	21.46	21.46	21.46	21.46	21.46	21.46	21.46	21.46	21.46
Accelerated depreciation benefit per unit (Rs / kWh)	9.39	-0.52	-0.52	-0.52	-0.52	-0.52	-0.52	-0.52	-0.52	-0.52	-0.52	-0.52	-0.52	-0.52	-0.52	-0.52	-0.52	-0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Levellised benefit of accelerated depreciation (Rs / kWh)	0.53																								