

**BEFORE THE KARNATAKA ELECTRICITY REGULATORY COMMISSION
BANGALORE**

Dated :10th October, 2013

- | | |
|-------------------------------|--|
| 1. Sri M.R. Sreenivasa Murthy | Chairman |
| 2. Sri Vishvanath Hiremath | Member |
| 3. Sri K. Srinivasa Rao | Member (pronouncing
separate order) |

OP No.19/2012

BETWEEN :

Indian Wind Energy Association (InWEA)
1st Floor, A-Wing, AMDA Building
7/6, Siri Fort Institutional Area
August Kranti Marg
NEW DELHI – 110 049
[Represented by M/s. Shridhar Prabhu Associates, Advocates]

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PETITIONER

AND

- 1) Bangalore Electricity Supply Company Limited
K.R. Circle
BANGALORE – 560 001
- 2) Hubli Electricity Supply Company Limited
P.B. Road, Navanagar
Hubli – 580 029
- 3) Gulbarga Electricity Supply Company Limited
Station Road,
Gulbarga – 585 101
- 4) Mangalore Electricity Supply Company Limited
Paradigm Plaza, A.B. Shetty Circle
Mangalore – 575 001

OP Nos.19/2012, 36/2012 and 43/2012

5) Chamundeshwari Electricity Supply Company Limited
 No.927, LJ Avenue
 New KantharajaUrs Road
 Saraswathipuram
 Mysore – 570 009

6) Karnataka Renewable energy
 Development Limited (KREDL)
 #39, "SHANTHI GRUHA"
 Palace Road
 Bangalore-560 001

..RESPONDENTS

*[R1 to R5 represented by M/s. Justlaw, Advocates and
 R6 represented by Shri G.S. Kannur, Advocate]*

OP No.36/2012**BETWEEN :**

Indo Wind Turbine Manufacturers Association
 Suit # A2, OPG Towers
 74 (Old #133), Santhome High Road
 Chennai – 600 004
[Represented by Petitioner's Representative]

.. PETITIONER**AND**

- 1) Bangalore Electricity Supply Company Limited
 K.R. Circle
 BANGALORE – 560 001
- 2) Mangalore Electricity Supply Company Limited
 Paradigm Plaza, A.B. Shetty Circle
 Mangalore – 575 001
- 3) Chamundeshwari Electricity Supply Company Limited
 No.927, LJ Avenue
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 Mysore – 570 009

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- 4) Hubli Electricity Supply Company Limited
P.B. Road, Navanagar
Hubli – 580 029
- 5) Gulbarga Electricity Supply Company Limited
Station Road,
Gulbarga – 585 101
- 6) Karnataka Renewable energy
Development Limited (KREDL)
#39, "SHANTHI GRUHA"
Palace Road
Bangalore-560 001

..RESPONDENTS

*[R1 to R5 represented by M/s. Justlaw, Advocates and
R6 represented by Shri G.S. Kannur, Advocate]*

OP No.43/2012**BETWEEN :**

- 1) Indo Wind Power Association
"SHAKTHI TOWERS", Tower-1
Door No.E, 6th Floor
No.766, Anna Salai
CHENNAI – 600 002
- 2) M/s. Mytrah Energy (India) Ltd.
8001, 8th Floor, Q City
Nanakramguda
Gachibowli
Hyderabad – 500 032

.. PETITIONERS

[Represented by Petitioners' Representative]

AND

- 1) The Principal Secretary
Department of Energy
Government of Karnataka
M.S. Building
Bangalore-560 001

OP Nos.19/2012, 36/2012 and 43/2012

- 2) Bangalore Electricity Supply Company Limited
K.R. Circle
BANGALORE – 560 001
- 3) Hubli Electricity Supply Company Limited
P.B. Road, Navanagar
Hubli – 580 029
- 4) Mangalore Electricity Supply Company Limited
Paradigm Plaza, A.B. Shetty Circle
Mangalore – 575 001
- 5) Gulbarga Electricity Supply Company Limited
Station Road,
Gulbarga – 585 101
- 6) Chamundeshwari Electricity Supply Company Limited
No.927, LJ Avenue
New Kantharaja Urs Road
Saraswathipuram
Mysore – 570 009
- 7) Karnataka Renewable energy
Development Limited (KREDL)
#39, "SHANTHI GRUHA"
Palace Road
Bangalore-560 001

..RESPONDENTS

*[R2 to R5 represented by M/s. Justlaw, Advocates and
R7 represented by Shri G.S. Kannur, Advocate]*

1) The above Petitions are filed requesting for: (a) curtailment of the Control Period or review period of 5 (five) years, from 1.1.2010 to 31.12.2014, fixed in the Commission's Tariff Order dated 11.12.2009 to 27 months from 1.1.2010 to 31.3.2012, in respect of Wind Power Projects; and (b) determination of preferential tariff for future Wind Energy Projects commissioned after 31.3.2012.

2) This Commission, by Order dated 11.12.2009, determined the tariff for Wind Energy at Rs.3.70 per Unit. In the same order, the Commission had also determined tariff for other Renewable Sources of energy. The tariff determined

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in the said Order was made applicable to all the new Renewable Energy Projects, which would enter into Power Purchase Agreements (PPAs) with Distribution Licensees on or after 1.1.2010 and within the control period of five years.

3) The Petitions in OP Nos.19/2012 and 36/2012 are filed under Sections 94(1)(f) and 64(h) of the Electricity Act, 2003 and Regulation No.12 of the KERC (Power Procurement from Renewable Sources by Distribution Licensee and Renewable Energy Certificate Framework) Regulations, 2011. The Petition in OP No.43/2012 is filed under Sections 62 , 86(1) and 94 of the Electricity Act, 2003, and Regulation Nos.9 and 12 of the KERC (Power Procurement from Renewable Sources by Distribution Licensee and Renewable Energy Certificate Framework) Regulations, 2011. These Petitions are filed on 8.5.2012, 2.8.2012 and 17.9.2012, respectively.

4) The contesting Respondent-ESCOs have taken preliminary objections regarding maintainability of the Petitions on the following grounds:

- (a) The Petitioners have participated in the public hearing and they have been heard before passing of the Tariff Order dated 11.12.2009 by the Commission. Therefore, they cannot now pray for a modification of the said Order;
- (b) The Petitioners have filed the Petitions seeking review of the Tariff Order dated 11.12.2009 after the expiry of the time-limit prescribed under Regulation No.8 of the KERC (General and Conduct of Proceedings) Regulations, 2000 and they have not given any reasons or explanation in the Petitions for the delay in filing the same;
- (c) The Commission has determined the Control Period upto December, 2014 in its Tariff Order dated 11.12.2009, after taking into account all the factors

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involved and the same has attained finality. Hence, the question of re-doing the exercise at this juncture would not arise;

(d) The prayer made by the Petitioners for limiting the Control Period from December, 2014 to March, 2012 is untenable and cannot be sustained;

(e) The present Petitions have been filed by Associations and not by a Generator or Distribution Licensee. Regulation No.9 of the KERC (Power Procurement from Renewable Sources by Distribution Licensee and Renewable Energy Certificate Framework) Regulations, 2011 specifies that the Commission can determine the tariff for Renewable Sources either *suo-motu* or on an application either by a Generator or by a Distribution Licensee. Therefore, these Petitions are not maintainable.

5) The Petitioners in OP Nos.43/2012 have, in their Rejoinder dated 24.1.1013, stated that the Petitions are maintainable and have requested for rejection of the preliminary objections on the maintainability of the Petition.

6) The Commission heard both the parties on the maintainability of the Petitions and, by Order dated 4.4.2013, decided as follows:

"9) While admittedly the Petitioners are not the sellers of electricity to the distribution licensees in the strict sense, it cannot be disputed that they are stakeholders in the establishment of Wind Power Generating Plants in the State. It cannot be said that the rates fixed by this Commission should not be reviewed by it, even if there are material changes in the field which make the rates unviable. Therefore, in our opinion, this Commission need not go only on technical grounds and refuse to address substantive issues which in the ultimate analysis are important to the electricity sector and the consumers.

10) In our view, this point on maintainability also can be considered along with the other points raised in the Petitions."

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7) Consequent to passing of the above Order, the Respondents have filed their Statement of Objections on the merits of the Petitions, besides urging the issue of maintainability of the Petitions, raised earlier. In the said objections, the Respondents have made submissions regarding the capital cost, capacity utilization factor, O&M expenses, loan tenure, interest on debt, return on equity and interest on working capital.

8) As the matter involves the consumers' interest, and as required under Section 64(2) of the Electricity Act, 2003 (hereinafter referred to as the 'Act'), this Commission directed the Petitioners to publish their Petitions in the Newspapers to enable interested persons to file their views / objections, if any. Accordingly, the Petitioners have published their Petitions in the Newspapers on 5.7.2013. The Commission thereafter, on 24.7.2013, also held a public hearing.

9) All these Petitions involve common questions and therefore they have been heard together with the consent of the parties and disposed of by this common Order.

10) During the arguments on maintainability, Shri Sriranga, the learned counsel for the Respondent-ESCOs contended that these Petitions are not maintainable in law. He submitted that the Order dated 11.12.2009 had been passed under the KERC (Power Procurement from Renewable Sources by Distribution Licensee) Regulations, 2004. Further, he submitted that Regulation Nos.5.7 and 5.8 of the said Regulations provided that the tariff determined by the Commission shall be applicable for a period of 10 (ten) years from the date as notified by the Commission and that it is subject to review after 5 (five) years, and as such, the revised tariff shall be applicable to Agreements entered into after that date and till the end of December 2014. He also pointed out that the earlier Tariff Order dated 11.12.2009 has been upheld by the Hon'ble Appellate Tribunal for Electricity (ATE), and that the earlier Tariff Order could be modified only on an application filed within 90 (ninety) days from the date of the Order.

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The present Petitions are filed almost after 18 months from the date of the earlier Order, and therefore these Petitions are not maintainable. Further, he submitted that this Commission is bound by its own Order, which has reached its finality and there is no provision in the KERC (Power Procurement from Renewable Sources by Distribution Licensee) Regulations, 2004 or the KERC (Procurement of Energy from Renewable Sources) Regulations, 2011, for modification of the Control Period.

11) Responding to the arguments of the Respondents' counsel on maintainability of the Petitions, the Petitioners have submitted that this Commission has powers under Section 62 read with Section 64 of the Act to modify the earlier Tariff Order. Further, it is submitted on their behalf that the 2004 Regulations of this Commission, under which 5 (five) years period of operation of Tariff is fixed, have been repealed by the 2011 Regulations, and under the 2011 Regulations, this Commission can at any time re-determine the Tariff.

12) The gist of the submissions made in the public hearing by the generating companies are as below:

Indian Wind Energy Association (IWEA):-

IWEA have stated that the revision is necessitated due to increase in prices of steel, cement and other Mechanical / Engineering components of wind turbines. IWEA has also furnished details of steel prices and cement prices from 2009 onwards. In response to the query about the manufacturing capability, the Commission was informed that at the national level the manufacturing capacity can cater to 8000 MW to 10000 MW annually.

IWEA have sought upward revision of capital cost to Rs.575 lakhs/MW and fixation of capacity utilization factor (CUF) of 25%, interest on loan at 12.3% and pre-tax Return on Equity at 20% for first ten years and 24% from 11th

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year onwards and O & M expenses at Rs.9 lakhs/MW, with an annual escalation of 5.72%.

Based on the above parameters IWEA requested a levelized tariff of Rs.4.92/KWh.

Indian Wind Turbine Manufacturers Association (IWTMA)

IWTMA have sought an upward revision of capital cost to Rs.575 lakhs / MW in line with 2012 CERC Tariff Order. Some details of projects commissioned in Karnataka registered with UNFCC have been furnished, according to which the cost varies from Rs.5.08 Crores /MW to Rs.6.78 Crores / MW and they have furnished documents in support of the capital cost certified by the Chartered Accountant. They have further pleaded that CERC's forecasting requirement would involve an additional cost to generators which would be approximately Rs.16 lakhs / MW. It was also stated that 16% import component of the turbine would be affected by forex fluctuations as these parts are not manufactured locally and need to be imported.

Further IWTMA have pleaded for a downward revision of the Capacity Utilisation Factor (CUF) to 22% (as against 26.5% at present, assumed in the 2009 Order). In support of this, they have furnished details of CUF actually realised by the projects commissioned in Karnataka and stated that the sites presently being brought into generation are in the wind zone III, with a CUF of around 22% to 23% only.

Regarding the working capital, IWTMA requested the Commission to add O & M cost of one month and spares at 15% of the capital cost in addition to two months receivables. They have requested for consideration of interest at SBI base rate plus 300 basis points and a pre-tax RoE of 20% for the first ten years and 24% for the remaining years.

Based on the above parameters IWTMA have requested for a levelized tariff of Rs.5.06 /KWh.

Sri D.V.Giri, Secretary General, IWTMA submitted that presently wind turbines in low and medium wind zones are being installed at a height of 80-100 meters to garner maximum operational efficiency and generation. Out of the annual 10,000 MW turbine manufacturing capability with the industry, 6000 MW to 6500 MW turbines are designed for low / medium wind zone areas. He also added that the CERC requirement of scheduling and forecasting would result in additional capital cost of Rs.10 lakhs to Rs.15 lakhs (one time) per MW and further the O& M cost of Rs.5 lakhs should be raised to Rs.10 lakhs / annum.

Indian Wind Power Association (IWPA):-

During the hearing the IWPA has stated that during the period 2009 to 2011 the cost of wind projects installed in the State varied from Rs.5.40 Crores/MW to Rs.6.00 Crores/MW. They have furnished CA certificates for some of the projects and also the costs of projects considered for UNFCC. In the light of the above they have requested fixation of the capital cost @ Rs.580/lakhs/MW.

IWPA have requested the Commission to consider a CUF of 22% based on the data furnished by them for the wind projects recently commissioned in Karnataka. It was informed that most of the wind projects in Karnataka have installed turbines at a height of 65 meter to 80 meter.

M/s Mythrah Energy India Pvt. Ltd.,

The representative of the firm submitted that CERC in its orders has linked the CUF with Wind Power Density (WPD). As per their experience, there is no definite correlation between WPD and CUF. Since the new projects in Karnataka will be in lower wind regions, they have requested the Commission to consider lowering the CUF to 22% and revise the tariff accordingly.

Regarding Generation based Incentives (GBI), he submitted to the Commission that it is an additional incentive to the developers, which will reduce their risk and requested not to factor likely GBI receipts in the tariff calculation.

It was further informed that in view of the drop in the rates in the CDM market, the entire CDM benefit should be allowed to be retained by the developers. The CDM benefit sharing would arise only when the CDM market value goes beyond 10 Euros per certificate. It was also informed that the generator would be incurring Rs.15 lakhs to Rs.25 lakhs for CDM registration and formalities.

Sri Nesargi, DGEL:

He stated that with the proposal of the Commission to withdraw concessional wheeling and banking, wind generators are compelled to fall back on PPA with ESCOMs which requires a viable and attractive tariff. In this regard he requested the Commission to determine zone wise wind tariff based on factors like CUF and WPD.

13) Additional / supplementary information has been filed by Indian Wind Turbine Manufacture Association and by M/s Mytrah Energy (India) Ltd., and the

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same have been taken on record. Written submissions have also been filed by the respondents.

14) We have considered the submissions of both the parties and also the submissions of those who appeared in the public hearing, along with the material produced by all the parties, both on maintainability as well as on merits.

15) Before dealing with the Petitions on merits, we deem it fit to consider the issue of maintainability raised by the Respondents' counsel, as it goes to the very root of the matter.

16) The preliminary question raised is, "whether this Commission has power to modify the Tariff Order issued on 11.12.2009, before the end of the Control Period of five years, especially in view of Clause 5.08 of the KERC (Power Procurement from Renewable Sources by Distribution Licensee) Regulations, 2004?"

17) We have carefully looked into the relevant provisions, viz., Section 62 read with Sections 64, 86 and 94, of the Electricity Act, 2003 and the KERC (Power Procurement from Renewable Sources by Distribution Licensee) Regulations, 2004 and KERC (Procurement of Energy from Renewable Sources) Regulations, 2011. In our view, none of these provisions puts an absolute embargo on this Commission against modifying the Tariff Orders passed by it.

18) Under Section 62 of the Act, this Commission has power to determine the tariff in accordance with the provisions of the Act for supply of electricity by a generating company to a distribution licensee, if an application is filed in accordance with Section 64 of the Act. There cannot be any doubt that the present Petitions are filed for re-determination of tariff as contemplated under Section 62, read with Section 64 of the Act. Though under Section 62(4) of the Act, the Commission cannot modify the tariff fixed ordinarily more frequently than once in a financial Year, it can modify the tariff, if there are circumstances

warranting such modification. The word, 'ordinarily' has been interpreted by the Hon'ble Supreme Court to mean that it does not include 'extraordinary' or 'special circumstances' [(2001) 1 SCC 315] Eicher Tractor Ltd., Vs Commissioner of Customs. The Hon'ble High Court of Delhi, in the case reported in **AIR 1993 Delhi 293**, Y.K.Banni Vs JNU has held that the word, 'ordinarily' means 'normally', 'in the ordinary course'. In our view, the factual matrix placed by the Petitioners before the Commission in these proceedings on the increase in the capital cost, O&M cost, interest rates, etc., does show that these costs have seen a substantial increase, justifying reconsideration of the tariff determined by this Commission in 2009. If the changed circumstances are not taken care of, it will be detrimental to the interest of the State and its consumers, as the investments in the Renewable Energy Sector, particularly in Wind, where large growth is expected, will not come on the expected scale.

19) This Commission, in our view, cannot ignore the essential thrust of the Electricity Act, 2003, for encouraging the Renewable Energy Sources, which are more sustainable than conventional sources. In fact, Section 86(1)(e) of the Act and the National Tariff Policy emphasize the role of the Regulatory Commissions in promoting Renewable Sources of energy. In our view, the goal of Legislative intent underlying the Electricity Act, 2003, can be better achieved if proper rates are fixed for the electricity generated from renewable sources.

20) In our view, the objections to modifying the Tariff Order based on the Control Period stated under the Regulations, 2004, do not stand close scrutiny. Though clause 5.8, on which heavy reliance is placed by the Respondents' counsel, states that the tariff determined by the Commission is subject to review after 5 years, it does not say that the tariff determined cannot be reviewed before the end of 5 years. Further Regulation 5.8 does not provide any control period. At any rate, the 2004 Regulations, have been repealed by the 2011 Regulations, after which the present Petitions have been filed. Under Clause No.

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9 of the 2011 Regulations, this Commission has been conferred with the power to modify the tariff at any time, either *suo-motu* or on an application filed by generators or DISCOMs, if the same is justified. As observed by us above, the facts placed before the Commission do justify modification of the Tariff fixed in the 2009 Order and therefore the Commission has decided to re-determine the Tariff for wind energy.

21) As regards the objection of the Respondents' counsel on the maintainability of the Petitions by the Generators' Associations, the same shall not detain us much longer. The Petitions are essentially representative Petitions by the Generators, which will avoid multiplicity of litigation. This Commission even earlier had entertained Petitions from Generators' Associations. The Hon'ble ATE has also entertained Appeals filed by the Generators' Associations against the Orders of this Commission.

22) Thus, we hold that the Petitions filed are maintainable on facts and in law.

23) After having dealt with the preliminary issue raised by the Respondents, we now proceed to deal with the Petitions on merits.

24) Determination of Tariff for procurement of power from wind power project:**24.1) Tariff Determination and Methodology.**

The Commission has to determine the Wind Power Tariff based on the broad principles contained in the tariff policy, the previous tariff orders and the KERC (Power procurement from Renewable sources by distribution licensee) Regulations, 2004 and KERC (Procurement of Energy from Renewable Sources) Regulations, 2011.

24.2) Process of Determination of Tariff.

The Tariff policy notified by the Central Government in pursuance of Section 3 of the Electricity Act, 2003 stipulates that the appropriate Commission may determine preferential tariff for procurement of power by distribution Licensees from non-conventional sources of Energy. Para 6.4 of the tariff policy states that it takes some time before non-conventional technologies can compete with the conventional sources in terms of the cost of electricity generation and therefore it is necessary to provide procurement by distribution companies at preferential tariffs determined by the Appropriate Commission.

The Commission has also noted that the working group constituted by the Forum of Regulators has recommended preferential tariff for renewable sources atleast during their loan tenure.

Keeping in view the above, the Commission decides to continue with the cost plus methodology as in the previous tariff orders issued by the Commission during the year 2005 and 2009, for determination of tariff for procurement of electricity from wind power projects by the distribution Licensees in the State.

The Government of India will provide an incentive of 50 paise / KWhr of electricity generated by wind power projects registered under the scheme. The incentive will however stop once the payout reaches Rs.1 Crore/MW of capacity. The Commission decides not to factor these incentives while computing the tariff for wind power projects as per para 4.6 of the circular dated 04.09.2013 issued by Government of India, Ministry of New and Renewable Energy.

24.3) Operational and financial parameters

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

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- a) Capital cost including evacuation system cost.
- b) CUF, Capacity Utilization Factor
- c) Debt Equity Ratio,
- d) Interest on term loan
- e) Depreciation
- f) Return on equity
- g) Operation and maintenance charges
- h) Interest on working capital
- i) Auxiliary consumption

a) Capital cost including evacuation system cost

One of the main reasons urged by the petitioners for curtailing the control period of tariff and effecting a revision of tariff is that the capital cost of wind generation plants has increased substantially since the issue of the last tariff order. The petitioners have stated that the wholesale prices of materials like steel, cement, electrical components and machinery have seen a steep increase since 2009 pushing up the cost of the manufacture of wind generation units. The petitioners in OP 12/2012 have specifically pointed out that the wholesale price index for iron and steel has gone up from 127.82 in 2009-10 to 152.49. Similarly the index of wholesale prices of cement has gone up from 148.89 to 168.76 and that of electrical equipment and machinery has gone up from 122.07 to 132.96 as per the data published by Government of India. They have also pointed out that the wind generation units have about 16% of imported component and the changes in the exchange rate since 2009 are also contributing substantially to increase in the cost of wind turbines.

In petition No. 43/2012, the petitioners have furnished Chartered Accountant's certificates relating to capital cost of several wind power units including those of M/s. Tadas Wind energy Limited, M/s. Swastik Construction Services, M/s. Tuppadahalli Energy Private Limited and M/s. Mythrah Vayu (Pennar) Pvt. Limited, with project cost ranging from Rs.5.69 crores to Rs.6.33

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crores per MW. The petitioners have also given information on the capital cost of wind power projects procured by several public sector companies in 2011-12 where the average cost is shown to be Rs.546 lakhs per MW.

On behalf of the Respondents, it is submitted that the Petitioners have not submitted the actual cost incurred by the manufacturers of Wind Turbines, with full details of material, labour, overheads and profits, and therefore the cost of equipment cannot be taken into consideration as given by the Petitioners. Further, it is submitted that the increase claimed in the cost of infrastructure is also not justified, as essentially, the infrastructure cost is on account of construction of approach roads, landscaping within the Wind Farm, power evacuation lines, etc., which are already available. As regards the statutory charges and fees, it is submitted that they are very small and will not contribute substantially to the cost of the Project. On the effect of increases in commodity prices, it is stated that Wind Turbines have mostly imported components and since they enjoy Customs Duty exemption, no increase can be taken on this count. Also, the Respondents, have submitted that the lands required for the Project development are generally Forest and Government Revenue lands, the cost of which is not high and are leased by the Government, and in these costs, there is not much of increase. Therefore, it is submitted on behalf of the Respondent-ESCOMs that there is no justification in allowing the increase in the Capital Cost based on CERC norms, which cannot be a benchmark (as the cost will vary from State to State, and from Site to Site).

The Commission is unable to accept the view canvassed by the Respondents that the cost of materials like cement, steel and machine parts in the country has little bearing on the wind power projects as the wind turbines and towers have a substantial content of indigenous manufacture. Further, we cannot also accept the view that wind power installations do not incur any significant expenditure on infrastructure. Wind turbines are and will be installed often in somewhat remote areas and the developers have to necessarily factor

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the costs of infrastructure like roads, similarly it is also not likely that most wind power plants in future will come up in Government lands as claimed by Respondents. As pointed out by Petitioners in OP 43 there are several restrictions which come in the way of allotting public lands and the future development of wind energy will necessarily involving private lands to a great extent. The cost of acquiring lands is also going up rapidly as evidenced by the periodical revision of guidance value of land by the Government of Karnataka.

The Commission notes that the CERC and TNERC have taken Rs.5.75 Crores per Mega Watt and the GERC has taken Rs.6.06 Crores per Mega Watt as the Capital Cost. The Karnataka Renewable Energy Development Limited (KREDL), a Nodal Agency of the state, which has also set up Wind Projects on its own, has submitted that the cost of the Project now is around Rs.5.5 Crores per Mega Watt. Therefore, considering the cost adopted by the other Commissions, submissions by KREDL and the cost details produced by the Generators, we consider Rs.5.60 Crores per Mega Watt towards Capital Cost as reasonable, which is inclusive of the evacuation cost of Rs.10 Lakhs per Mega Watt.

b) CUF, Capacity Utilization Factor

In the Tariff Order issued on 11.12.2009, the Commission had assumed a Capacity Utilization Factor (CUF) of 26.5% for Wind Power Units in the State. The Petitioners have claimed that the sites which are capable of giving a high CUF in the State have almost been fully exploited over the years and the Sites available for future development could only yield a much lower CUF than assumed earlier. Among the Petitioners, the Indian Wind Energy Association has suggested the adoption of an average CUF of 25% as the norm while the other Petitioners have suggested 24 % (Indo Wind Turbine Manufacturers Association) and 20-22% (Indo Wind Power Association).

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The ESCOMs have submitted that CUF for the Wind Projects in the State should be taken as 28%, relying on two Projects developed by KREDL at Mavinahundain in Raibagh Taluk and Sogi Hills in Harapanahalli Taluk.

The Commission notes that Wind Power Density, which depends upon wind velocity and air density, along with the duration over which the required wind velocity is maintained, is a crucial factor in determining the CUF, as adopted by the CERC in their tariff order on wind energy. Machine-specific parameters, like hub height and the efficiency of the turbine are the other factors contributing to the CUF. According to the Indian Wind Atlas of 2010 published by the Centre for Wind Energy Technology (C-WET), the Wind Power Density in the State varies from district to district. At 50 Metres hub height, about 60% of the State is in Zone-1, with less than 200 Watts/Mtr² and capable of yielding a CUF of about 20%. Other areas consisting of about 25% of the State's area (Zones-2 and 3) have a WPD of Watts/Mtr² of 200 to 300, with a CUF potential of 22% to 25%. The remaining 15% of the area, classified as Zones-4 and 5, has a potential of about 300 Watts/Mtr², capable of yielding a CUF of more than 30%.

The Karnataka Renewable Energy Development Limited (KREDL) has, in its submission, indicated that during the year 2011-12, the power generated was 3674.45 MU, with an installed capacity of 1980 MW connected to the Grid, which works out to a CuF of 21.18%. However, the agency has not given details of the installed capacity at the beginning and at the end of the relevant years to verify whether partial generation by units installed during the year has been taken into account.

The Commission has considered the submissions made by different parties on this point and also the data published by C-WET in their Indian Wind Atlas of 2010.

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As noted in the C-WET data mentioned above, 40% of the State's area is capable of yielding a CUF ranging between 22% and 32%, even at 50 Mtrs hub height. Further, with the advancement in the Wind Turbine technology and the adoption of installation of units at higher hub heights of 80 Mtrs and above in the recent years, the CUF of even relatively low potential areas is capable of being improved. Since the Commission has decided to allow an increase in the capital cost, it will be possible now for the developers to adopt improved technology and install machines at higher hub heights to achieve higher CUF.

Keeping the above factors in view, the Commission considers it reasonable to specify a normative CUF of 26.5%, which is the CUF assumed in the previous Tariff Order issued on 11.12.2009.

c) Debt Equity Ratio

The tariff policy formulated by the Ministry of Power, Govt. of India, under Section 3 of the Electricity Act, 2003 stipulates a debt equity ratio of 70:30 for power projects, KERC in its tariff order dated 11.12.2009 has also adopted a debt equity ratio of 70:30. One of the petitioners in OP No.19/2012 has proposed to keep the debt equity ratio at 70:30. The Respondent ESCOMs have also submitted to continue the debt equity ratio at 70:30. Hence, the Commission decides to retain debt equity ratio as 70:30 in the present order.

d) Interest on term loan

The Commission in its wind tariff order dated 11.12.2009 had considered interest on term loan at 11.75%. The petitioners have requested to allow interest on loan at 12.3% to 13%. The Respondent ESCOMs have submitted that the SBI base rate has varied in the range of 7.5% to 10% during the period in July 2009 to August 2010. The interest rates being charged by IREDA, PFC and other lending agencies have remained at around 11% to 12%. In the light of the submissions

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made by the petitioners and considering the existing base lending rate of 9.80%, the Commission decides to allow interest rate at base lending rate plus 250 basis points to absorb risk of investments and decides to allow an interest rate of 12.3%.

e) Depreciation

CERC in its CERC (Terms and Conditions for Determination from Renewable Energy Sources) Regulations, 2012 has adopted the capital cost of the assets 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 upto a maximum 90% of the capital cost of the asset. Depreciation per annum is based on 'Differential Depreciation Approach' over loan tenure and the depreciation beyond loan tenure is computed over a useful life on 'Straight Line Method'.

The Commission in its order dated 11.12.2009 had considered a higher rate of depreciation than the SLM as a promotional measure during the loan tenure and the remaining depreciation was spread over the remaining useful life and allowed a depreciation of 7%. Petitioner in OP No.19/12 has sought 5.83% depreciation for the first 12 years and 1.54% from 13th year onwards. Respondent ESCOMs have submitted that the life of the wind turbine generator and its associated electrical accessories is around 25 years, considering a scrap value of 10%, the remaining 90%, if depreciated even in 20 years, the annual depreciation comes to 4.5%. This works out to about Rs.21 lakhs / year considering the project cost as Rs.4.70 Crores. They have further submitted that as an incentive, higher depreciation rate was offered in the initial stages of development to encourage Renewable Energy Power. Now the sector has matured and the generators noting the scope for growth in the wind generation industry are coming forward themselves to invest in Wind Energy Generation. Further they have contended that this is the reason for withdrawing the accelerated depreciation benefit of 80% in the 1st year itself by MNRE. The 7%

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depreciation allowed in the 2009 order is very high and needs to be reduced to 4.5% for 20 years period. Considering the submissions made by the petitioner and the respondent ESCOMs, the Commission decides to adopt 5.83% depreciation for the first twelve years of wind energy projects.

f) Return on equity

The Commission in its order dated 11.12.2009 has allowed an RoE of 16% post tax. The petitioners have requested RoE at 16% (in OP No.43/2012), and 20% for the first 10 years and 11th year onwards 24% (in OP No.19/2012). Respondent ESCOMs have submitted that the RoE allowed by the Hon'ble CERC is very high and it ought to be limited to a value equal to interest rate plus 2%. They have also stated in their submission that developers and investors invariably make a high revenue gain over the life of the plant of 25 years. Further, developers and investors utilise a part of the RoE towards early clearance of loan, so as to get major benefits after loan period comes to an end. Under such circumstances, it is unnecessary to revise the RoE fixed in the order dated 11.12.2009 and sought to continue RoE at 16% post tax.

The Commission notes that the RoE allowed in the last tariff order is sufficient and decides to continue the rate of RoE at 16% post tax.

g) Operation and maintenance charges

The Commission had, in its earlier wind tariff order dated 11.12.2009 considered the O & M expenses at 1.25% of the capital cost with escalation of 5% annually. The Commission had noted that CERC RE Tariff Regulation 2012 specified the O & M cost to Rs.9 lakhs/MW with an annual escalation of 5.72%. The petitioners also have sought similar O & M expenses. The respondent ESCOMs have submitted that maintenance as well as consumption of spares is very minimum during the first 10 years of operation, which is corroborated by the Petitioners claim that improved technology has resulted in more efficient WTGs. In the light of the

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above, the annual escalation need not be considered from the 2nd year onwards and it can be postponed to the 3rd year of operation and be allowed upto 10 years with an annual escalation of 5%. It was further submitted by the respondent - ESCOMs, that any indicative percentage would have unwarranted financial implication if the project cost is increased.

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.5,87,500/MW considered by the Commission in its tariff order 11.12.2009 if escalated by 5% annually comes to Rs.6.75 lakhs / MW for 2012-13 which is adequate. The Commission decides to retain the O & M cost at the same percentage i.e. 1.25% of capital cost with 5% escalation annually.

h) Interest on working capital

The Commission in its last wind tariff order had considered the interest rate on working capital at 13.25% which is equivalent to 1.5% above the rates approved for term loans. One of the petitioners in OP No. 43/2012 has sought interest on working capital at 14.5%. The respondent ESCOMs have submitted that the demand of the petitioner works out to Rs.15.71 lakhs / month and no case whatsoever is made out by the petitioner in justification of the same and further submitted that customarily, the manufacturers / developers / investors should furnish their last 10 years O & M cost and working capital details for independent verification by a Government agency. This procedure was not followed and the claim is without justification and requested the Commission to continue the working capital required as already fixed in the Commission's 2009 order.

After taking into consideration the submission made by the respondents that interest on working capital allowed in the last tariff order itself is on the higher side, and keeping in view the prevailing trends in interest rates, the Commission decides to fix interest on working capital at 13%.

i) Auxiliary consumption

The Commission in the last tariff order had considered 0.5% as auxiliary consumption in respect of wind power projects. As the petitioners have not claimed any revision and ESCOMs also have not made any submission in this regard, the Commission decides to retain auxiliary consumption at 0.5%.

25) Considering the parameters as approved by the Commission in the preceding paragraphs, the Commission has worked out the cost of generation of wind power and other details as shown in the Annexure.

In view of the above, the Commission determines the tariff for wind projects at Rs.4.20/unit without any escalation for the period of PPA and the same shall be applicable to all the power purchase agreements signed during the period of five years from the date of this order. The order of this Commission dated 11.12.2009 in so far as it relates to tariff for wind energy stands superseded with immediate effect.

This order is signed dated 10th October, 2013 and issued by the Karnataka Electricity Regulatory Commission on this 10th day of October 2013.

Sd/-

(M.R. SREENIVASA MURTHY)
CHAIRMAN

Sd/-

(VISHVANATH HIREMATH)
MEMBER