



National Electric Power Regulatory Authority Islamic Republic of Pakistan

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No. NEPRA/TRF-WPT/2017/1542-1544
January 27, 2017

Subject: **Determination of New Tariff for Wind Power Generation Projects**

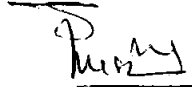
Dear Sir,

Please find enclosed herewith the subject Determination of the Authority (06 pages).

2. The Determination is being intimated to the Federal Government for the purpose of notification of the approved tariff in the official gazette pursuant to Section 31(4) of the Regulation of Generation, Transmission and Distribution of Electric Power Act (XL of 1997).

3. Order of the Authority needs to be notified in the official Gazette.

Enclosure: As above


27.01.17
(Syed Safer Hussain)

Secretary
Ministry of Water & Power
'A' Block, Pak Secretariat
Islamabad

CC:

1. Secretary, Cabinet Division, Cabinet Secretariat, Islamabad.
2. Secretary, Ministry of Finance, 'Q' Block, Pak Secretariat, Islamabad.

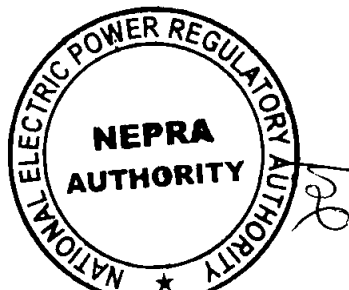


DETERMINATION OF NEW TARIFF FOR WIND POWER GENERATION PROJECTS

1. National Electric Power Regulatory Authority (hereinafter referred to as the "Authority") was established under section 3 of the 'Regulation of Generation, Transmission and Distribution of Electric Power Act, 1997' (hereinafter referred to as the "Act") and its responsibilities under the Act include, inter alia, determination of tariff, rates, charges and other terms and conditions for supply of electric power services by Generation, Transmission and Distribution companies. In performing its functions under the Act, the Authority has to protect, as far as practicable, the interests of consumers and companies providing electric power services in accordance with the guidelines, not inconsistent with the provisions of the Act laid down by the Federal Government.
2. In order to facilitate development of wind power generation, the Authority in past has determined upfront tariffs for generation of electricity from wind power. The last upfront tariff for wind power generation was determined by the Authority on June 24, 2015 (hereinafter referred to as the "Upfront Tariff, 2015") which was valid till June 13, 2016. In order to decide whether to continue the upfront tariff regime or to shift towards competitive bidding mode, the Authority decided to initiate suo moto proceedings in exercise of its powers under the Act read with Rule 3 (1) of the National Electric Power Regulatory Authority (Tariff Standards and Procedure) Rules, 1998 (hereinafter referred to as the "tariff rules"). In view thereof, for obtaining input from the stakeholders a draft tariff proposal was developed on the basis of data and information available with the Authority.
3. In line with the tariff setting process envisaged in the tariff rules, and with a view to arrive at a just and informed decision, notice of public hearing and salient features and parameters of the draft tariff proposal were published in the widely circulated national newspapers on June 14, 2016 inviting participation of the stakeholder through filing of intervention requests and comments. The Authority also issued separate notices to various stakeholders for filing their comments, if any, on the draft tariff proposal and its underlying terms and conditions. The advertised tariff, along with its salient features were as follows;

Years	With 100% foreign debt	
	Tariff (Rs. /kWh.)	Tariff (US cents /kWh.)
1 to 13	9.4042	8.9564
14 to 20	4.5891	4.3706
Levelized (1-20 Years)	8.6066	8.1968

- Project Cost of USD 1.93 million per MW (foreign financing)
- Annual net plant capacity factor of 37%.
- Operation and Maintenance component of Rs. 1.0670/kWh
- Insurance during operation of Rs. 0.5592/kWh.
- Debt : Equity structure of 75 : 25.
- IRR of 16%
- Exchange Rate parity of PKR 105/USD.
- Eighteen (18) months construction period
- Debt Repayment period of thirteen (13) years

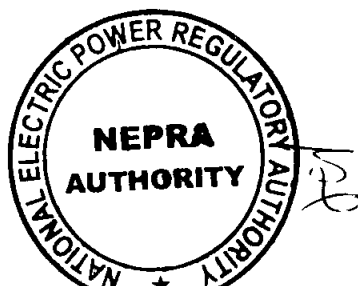


- LIBOR value of 0.6%
- Spread over LIBOR of 4.00%
- PKR/USD parity of 105

4. It was also stated in the advertised notice that the proposed costs and assumptions may vary (upward/downward) based on information/data gathered as well as received from the stakeholders during the proceedings. It was also specified that the power purchaser will not take the wind risk; relevant wind power project will have to account for this risk. One of the issues framed for the proceedings was whether to determine another upfront tariff for wind power projects or to determine a benchmark levelized tariff for competitive bidding by the relevant agencies for obtaining comments from the stakeholders.
5. In response to the notice of public hearing, twenty two intervention requests as well as comments from ten parties were received by the Authority; details of which are tabulated hereunder;

S.NO	Interveners	S.NO	Commentators
1	Act2wind	1	Arooj Asghar
2	Anwar Kamal Law Associates	2	Asian Development Bank (ADB)
3	Bridge Factor	3	Bank Alfalah
4	Din Energy	4	CPPA-G
5	Gul Ahmed Electric	5	Cacho Wind Energy
6	GAMESA	6	FFC Energy Limited
7	Indus Energy Limited	7	International Finance Corporation (IFC)
8	Iran-Pak Wind Power Pvt. Limited	8	National Bank of Pakistan
9	Lahmeyer International	9	Qureshi Law Associates
10	Lakeside Energy Pvt. Limited	10	SINEW Associates (Pvt.) Limited
11	Lucky Wind Power Limited		
12	Master Green Energy		
13	NASDA Green Energy Pvt. Ltd		
14	Nordex		
15	Norinco International		
16	Shaheen Foundation PAF		
17	Trans Atlantic Energy Pvt. Ltd.		
18	Tesla Industries (Pvt.) Ltd.		
19	UniEnergy Limited		
20	Western Energy Pvt. Ltd		
21	Yunus wind power limited		
22	Zulaikha Energy Pvt. Ltd.		

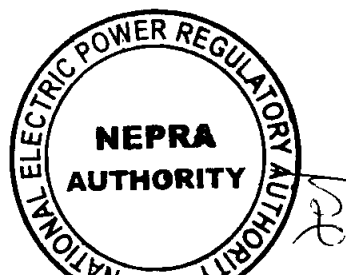
6. Public hearing in this regard was held on July 19, 2016 at NEPRA Tower, Islamabad, which was also attended by representatives of Alternative Energy Development Board ("AEDB"), Government of Sindh ("GOS"), Central Power Purchasing Agency Guarantee Limited ("CPPA-G"), Project Sponsors, Turbine Suppliers, and various other stakeholders.




A handwritten signature in black ink, likely of an official from NEPRA.

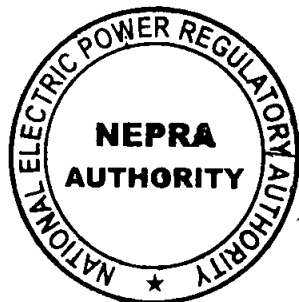
Discussions, Analysis and Determination of the Authority

7. Majority of interveners were of the view that to ensure transparent and competitive bidding, one of the most important factor is the creation of level playing field for all the potential investors which is not presently the case in Pakistan. A number of projects have been issued Letter of Intents (LOIs) which are at different stages of project development. These developers have in most cases installed wind masts and conducted detailed feasibility studies (e.g. Topographic Study, Soil Study, Transportation Study etc.), NTDC's approved grid studies etc. Hence, introducing competitive bidding at this stage will result in losses to the investors and delays in the development of wind sector. The participants further submitted that carrying out an effective competitive bidding process requires extensive planning, standard documentation, simple framework and clear policies and stated that in the absence of proper framework, initiating competitive bidding process would only cause uncertainty and delays. The participants also submitted that international experience in certain developing markets show that in some cases competitive bidding attracts low quality equipment due to price sensitivity of the bidding process, due to which wind resource is not effectively utilized and the benefit to the consumers is not materialized. The interveners further submitted that it has also been seen in the international bidding that bidders proposed lowest tariff on aggressive financial structuring, however, majority of such projects do not mature which does not only spoil the chances of realistic investors to put up projects but also delay the progress of deployment of wind energy. The representative of AEDB during the hearing, inter alia, submitted that the preparation of framework for competitive bidding shall take 9 to 12 months.
8. GOS also supported this point and submitted that a number of sites are already being developed (at various stages) and these cannot be shifted under the terms and conditions set under the LOI, therefore, requested to determine upfront tariff for those projects and competitive bidding could be considered for new projects. CPPA-G on the contrary advocated that it is now the right time to introduce a benchmark tariff for competitive bidding as the sector has gained much more confidence and the wind risk factor has markedly reduced due to the availability of reliable wind data for the last few years. CPPA-G also submitted that concerned agencies should be allowed to conduct feasibility studies at their own cost to make the site solicited. The transfer of technology may also be encouraged in the competitive bidding process through the award of certain incentives.
9. Ministry of Water and Power (MoW&P) in its initial comments vide its letter dated October 20, 2016 submitted that specific time may be allowed to AEDB for development of auction framework and in the meanwhile, NEPRA may consider announcement of upfront tariff for the same period. Subsequently, AEDB vide its letter dated December 16, 2016, inter alia, submitted that it has initiated the process of developing competitive bidding framework with the support of technical expertise available through donor agencies for which it would take 10-12 months. AEDB further submitted that the mechanism for disposal of remaining LOIs for wind and solar power projects would also be developed in the course of development of aforesaid framework.
10. Contrary to above, Punjab Power Development Board ("PPDB") vide its letter dated December 16, 2016 informed that it has invited applications for the award of land in Quaid-e-Azam Solar Park (Extension) for the development of 100 MW Solar Power Project (SPP) from those project developers who are willing to sell energy at US Cents 6/kWh or below, i.e. quite lower than the new tariff advertised by the Authority for public hearing to seek views of the commentators. Later,



MoW&P vide its recent most letter on January 12, 2017 has proposed that competitive bidding in reverse auction, being the prudent step in prevailing circumstances, be carried out through AEDB against the remaining cushion of wind power projects as well as against any future capacity as determined by Grid Code Review Panel ("GCRP") for sport year-I and subsequent years.

11. Having considered the arguments put forth by some of the stakeholders, the Authority is not inclined to accept their concerns that international prices are quoted less to win the project. The Authority further considers that the procurement of power under transparent competitive process is most appropriate as it can fetch realistic prices based on the prevailing conditions of the market. It has also been observed that competitive bidding mode has been the most successful and preferred mode for arriving at fair and judicious prices and after announcing three upfront tariffs for wind technology, this is the appropriate time for a logical shift towards competitive regime. In Authority's opinion, the issuance of LOIs should not to be considered an impediment for the shift towards competition for which AEDB has also submitted that the mechanism for disposal of LOIs would be developed in the course of development of auction framework. In view of all the above, the Authority has decided to declare the determined tariff in this decision as Benchmark Levelized Tariff which shall be used to carry out competitive bidding under NEPRA Competitive Bidding (Approval Procedure) Regulations, 2014 by the relevant agencies.
12. The Authority has in detail analysed the data of project costs and energy yields of wind power plants installed worldwide in last few years. Regarding project cost, the Authority has noted that the global prices have seen noticeable decrease since 2008. The major cost component, i.e. the turbine prices are found to be in the range of USD 0.90 to 1.2 million per MW and the corresponding project cost was around USD 1.5 to 1.6 million per MW. Nevertheless, the local factors such the existing market conditions, local manufacturing bases and other technological and economic factors were also considered.
13. Regarding the efficiencies, the data of energy yields in different regions of the world and their trend in last couple of years were reviewed. It has been noted that worldwide, the capacity factors have improved over time among projects located within a given wind resource regime. The primary reason of this improvement has been the change in turbine design through improvement in hub height, nameplate capacity and especially through enhancement in rotor diameters. Further the Authority has also analysed the data of energy yields of currently operational wind power plants in the country and it has noted that the capacity factors vary among the wind farms and the energy yields of up to 35% has been achieved.
14. The Authority is further cognizant of the fact that there is absence of local expertise for doing operation and maintenance of the incumbent wind power projects. The Authority also understands that in order to achieve higher level of efficiencies/capacity factor, the project developers will be required to seek higher level of guarantees from the O & M contractors resulting in increase in O & M prices. Being mindful of the issues highlighted by the interveners regarding O& M costs, the Benchmark tariff for competitive bidding will address the concerns thereof.



ORDER

15. In view of the above discussions and considering the submissions of all the stakeholders, international prices, technology trends and the data of operational wind power plants, the Authority hereby determines and approves the following Benchmark Levelized Tariff for competitive bidding by relevant agencies for wind power generation, for delivery of electricity to the power purchaser:

BENCHMARK TARIFF ON BOO BASIS

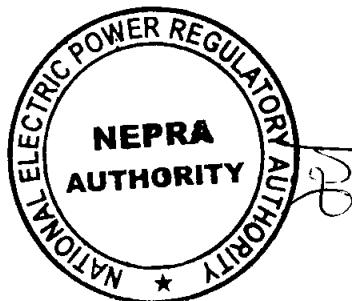
Rs./kWh

Years	O&M	Insurance	(100% foreign debt)		(100% local debt)	
			Return on Equity	Debt Servicing	Return on Equity	Debt Servicing
1 to 13	1.1986	0.2523	1.9406	4.7184	1.9944	5.9746
14 to 25	1.1986	0.2523	1.9406	-	1.9944	-
Levelized Tariff	1.1986	0.2523	1.9406	3.6924	1.9944	4.6755

- Benchmark Levelized tariff on 100% foreign financing discounted at 10% per annum works out to US cents 6.7467/kWh. On 100% local financing, Benchmark Levelized Tariff works out to be US cents 7.7342/kWh
- Three months LIBOR of 0.6% has been used.
- Three months KIBOR of 6% has been used
- Reference TT & OD selling rate of US dollar of 105/USD has been used

General Conditions

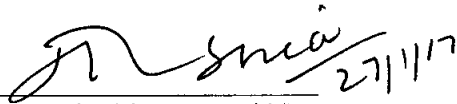
- This tariff is applicable for wind power generation only.
- The relevant agencies shall conduct the bidding under NEPRA Competitive Bidding (Approval Procedure) Regulations, 2014.
- The validity period for this tariff is 365 days from the date of issuance of this determination.
- The power purchaser will not take the wind risk; relevant wind power generation company shall be required to account for this risk.
- General assumptions, which are not covered in this determination, may be dealt with as per National Electric Power Regulatory Authority Competitive Bidding (Approval Procedure) Regulations, 2014, Request for Proposal to be developed by the relevant agencies.

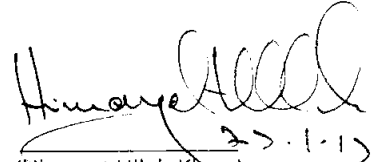


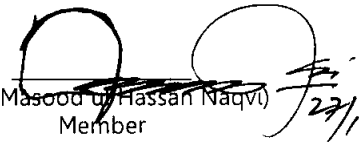


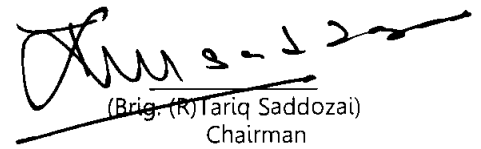

16. The above order of the Authority is recommended for notification by the Federal Government, in the official Gazette, in accordance with Section 31(4) of the Regulation of Generation, Transmission and Distribution of Electric Power Act, 1997.


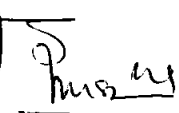
AUTHORITY


(Maj. (R) Haroon Rashid)
Member


(Himayat Ullah Khan)
Member


(Syed Masood ul Hassan Naqvi)
Member


(Brig. (R) Tariq Saddozai)
Chairman



27.01.17