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Islamic Republic of Pakistan

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No. NEPRA/TRF-426/DEL-2017/18049-18051
November 19, 2018

Subject: **Determination of the National Electric Power Regulatory Authority in the matter of Tariff Petition filed by Din Energy Limited for Determination of Reference Generation Tariff in respect of 50 MW Wind Power Project** [Case # NEPRA/TRF-426/DEL-2017]

Dear Sir,

Please find enclosed herewith the subject Determination of the Authority along with Annexure-I & II (26 pages) in Case No. NEPRA/TRF-426/DEL-2017.

2. The Determination is being intimated to the Federal Government for the purpose of notification in the official gazette pursuant to Section 31(7) of the Regulation of Generation, Transmission and Distribution of Electric Power Act, 1997.

3. The Order part along with Annexure-I & II of the Authority's Determination are to be notified in the official Gazette.

Enclosure: As above

19 11 18
(Syed Safeer Hussain)

Secretary
Ministry of Energy (Power Division)
'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 THE NATIONAL ELECTRIC POWER REGULATORY AUTHORITY IN THE MATTER OF TARIFF PETITION FILED BY DIN ENERGY LIMITED FOR DETERMINATION OF REFERENCE GENERATION TARIFF IN RESPECT OF 50 MW WIND POWER PROJECT

1. Din Energy Ltd. ("DEL" or "the petitioner" or "the company/project company") vide its letter dated December 12, 2017 filed a tariff petition before National Electric Power Regulatory Authority ("NEPRA" or the Authority") under the Regulation of Generation, Transmission and Distribution of Electric Power Act, 1997 ("NEPRA Act") and NEPRA (Tariff Standards & Procedure) Rules, 1998 for determination of reference generation tariff in respect of its 50 MW wind power project ("the project") envisaged to be set up at Deh Kohistan, Tapo Jangshahi, District Thatta, Sindh. The petitioner requested for the approval of levelized tariff of US Cents 7.2151/kWh (Rs. 7.5759/kWh) over the tariff control period of 25 years.

SUBMISSIONS OF THE PETITIONER

2. The petitioner submitted that it is a company established under the laws of Pakistan. Letter of Intent ("LOI") was issued to DEL by Directorate of Alternative Energy, Energy Department Government of Sindh ("GOS") on July 24, 2015 for establishing a 50 MW wind power project. On December 11, 2017, the validity of the said LOI was extended by GOS till May 17, 2019.

3. DEL also submitted the minutes of the meeting of Panel of Experts ("POE") of GOS dated October 31, 2017 which was conducted to review the feasibility study submitted by the project company. In that meeting, the POE approved the feasibility study of the project and advised the project company for further perusal of tariff and generation license. The generation license has been issued by NEPRA to DEL on February 1, 2017.

4. Summary of the key information provided by the petitioner is as follows:

Project company	:	Din Energy Limited
Sponsors	:	Din Group of Companies
Capacity	:	50 MW
Project location	:	Deh Kohistan, Tapo Jangshahi, District Thatta, Sindh
Land area	:	325 acres (allocated by GOS)
Concession period	:	25 years from Commercial Operations Date

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Power purchaser	:	Central Power Purchasing Agency Guarantee Ltd.	
Wind turbine	:	Siemens Gamesa Renewable Energy	
Model	:	G114-2.0	
Plant capacity factor	:	38%	
Annual energy generation	:	166.440 GWh	
EPC contractor	:	Hydrochina Corporation	
Project cost		**USD in millions**	
EPC cost	:	78.000	
Non-EPC & Project Development Cost	:	3.200	
Insurance during construction	:	0.450	
Financial Charges	:	2.100	
Interest during construction	:	3.500	
Total project cost	:	**87.250**	
Financing structure	:	Debt: 75% : Equity: 25%	
Debt composition	:	50% local % 50% foreign loan	
Interest rate	:	3 month KIBOR (6%) + 2.5%	
	:	3 month LIBOR (0.6%) + 4.5%	
Debt repayment period	:	13 years	
Return on equity	:	15% IRR based	
O&M cost	:	USD 1.95 million per annum	
Insurance cost	:	USD 0.39 million per annum	
		PKR/kWh	**US¢/kWh**
Levelized Tariff	:	7.5759	7.2151
Exchange rate	:	1 USD = PKR 105	

PROCEEDINGS:

5. The Authority considered the tariff petition and admitted the same for further processing. Notice of Admission/Hearing containing salient features of the petition, hearing schedule and issues framed for hearing was published in two national daily newspapers on March 18, 2018. Through the said notice, NEPRA invited comments and intervention requests from the interested parties within fourteen (14) days of publication of notice. Tariff petition and Notice of Admission/Hearing were also published on NEPRA's website for information of general public.

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Individual Notices of hearing were also sent to the stakeholders, considered to be relevant, and the petitioner on March 20, 2018 for participation in the proceedings.

6. The hearing on the subject matter was held on April 5, 2018 (Thursday) at 11:15 A.M. at NEPRA Tower, Islamabad, which was attended by a large number of participants including the petitioner, representatives of National Transmission & Despatch Co. Ltd. ("NTDCL"), Punjab Power Development Board ("PPDB"), GOS etc.

7. In response to Notice of Admission/Hearing, comments were received from Central Power Purchasing Agency (Guarantee) Limited (CPPA-G) dated March 27, 2018 whereas no intervention request was received from any party. The comments of CPPA-G are discussed in the relevant paragraphs of this determination.

ISSUES FRAMED:

8. Following is the list of issues that were framed by the Authority for the hearing:

i. Whether the details provided for EPC cost are sufficient and whether the claimed EPC cost is competitive and comparative and based on the firm and final agreement(s)? and
ii. Whether the NEPRA (Selection of EPC Contractor by IPPs) Guidelines, 2017 have been fully complied with?
iii. Whether the details provided for Non-EPC cost are sufficient and claimed Non-EPC cost is justified? Also provide justification for land requirement as claimed by the petitioner.
iv. Whether the claimed annual energy generation and corresponding plant capacity factor are reasonable and justified? And
v. Whether the petitioner's proposed wind turbine technology satisfies the international standards of quality and operation?
vi. Whether the claimed O&M costs are justified? Provide rationale of claiming foreign & local O&M cost.
vii. Whether the claimed insurance during operation cost is justified?
viii. Whether the claimed return on equity is justified?
ix. Whether the claimed financing/debt terms are justified?
x. Whether the claimed construction period is justified?
xi. Any other issue with the approval of the Authority.

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9. The issue wise submissions of the petitioner and the Authority's findings and decision thereon are as under:

Whether the details provided for EPC cost are sufficient and whether the claimed EPC cost is competitive and comparative and based on the firm and final agreement(s)? and whether the NEPRA (Selection of EPC Contractor by IPPs) Guidelines, 2017 have been fully complied with?

10. The petitioner has claimed USD 78.000 million on account of Engineering, Procurement and Construction ("EPC") cost in its tariff petition. In this regard the petitioner has submitted copies of EPC contracts signed on December 07, 2017. The breakup of the EPC cost as provided by the petitioner is given hereunder:

EPC cost	**(USD in million)**
Offshore contract	66.900
Onshore contract	11.100
Total	**78.000**

11. The petitioner has submitted that it has carried out comprehensive competitive bidding process for selection of EPC contractor and Wind Turbine Generator ("WTG") manufacturer for the project. Following EPC contractors/WTG manufacturers were issued the Request for Proposal ("RFP") on April 01, 2016:

a. Vestas Denmark
b. CSIC China
c. HydroChina Corporation
d. Nordex Germany
e. Descon Pakistan
f. Orient Pakistan
g. Shangdong Swiss Electric Co. China
h. TBEA Xinjiang Sun Oasis Co. Ltd. China
i. SANY Group Co. Ltd. China

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12. The petitioner submitted that post circulation of RFP, bid clarification meetings were held with the parties. Last date for submission of bids was May 02, 2016 by which seven parties submitted their bids. Two (02) envelope bidding process was adopted whereby technical and financial bids were submitted in two separate envelopes. Technical bids were evaluated as per pre-defined criteria and bidders qualifying technical evaluation were then evaluated on the basis of financial bids. Based on combined technical and financial evaluation, HydroChina Corporation with Siemens Gamesa turbine was declared as the first preferred bidder in June, 2016. Then based on negotiations the company signed Offshore Contract with M/s Power Construction Corporation of China Limited on December 07, 2017 which includes procurement and supply of electrical and mechanical equipment outside Pakistan. The Onshore Contract was signed with M/s Hydrochina International Engineering Company Limited on December 07, 2017 which includes civil works, erection, testing, commissioning etc. The EPC contractor will install 25 x G 114-2.0 at 93m hub height WTGs for the project. The petitioner submitted that it commenced the EPC contractor selection bidding process in April, 2016 and selected the preferred bidders by June 2016, i.e. nearly a year prior to issuance of "NEPRA (Selection of EPC Contractor by IPPs) Guidelines 2017", issued on May 19, 2017, however, the selection process was substantially in line with the Guidelines.

13. NEPRA vide letter dated May 11, 2018 directed DEL to submit the complete documents related to bidding process followed by the project company for the selection of the EPC contractor. In response, the petitioner submitted all the documents with respect to the bidding process vide letter dated May 30, 2018.

14. To evaluate the EPC cost claim of DEL, the Authority has considered the latest available EPC cost data in different parts of the world. The information given in the reports published by International Renewable Energy Agency ("IRENA"), Bloomberg and other sources has been relied upon for this purpose. Furthermore, the tariff determinations approved by the regulators of countries in different regions have also been studied. The costs allowed by the Authority in previously determined wind power projects were also examined. After analysing all this information, the Authority is of the view that EPC cost of USD 78.000 million as claimed by DEL is on the higher side. The process of selection of contractors followed by the petitioner may have been transparent; however, the same has not yielded prices which can be considered competitive

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and comparative. The considerations of the Authority for the assessment of the EPC costs to be allowed to the petitioner are given in the following paragraph.

15. It was noted that the average wind turbine prices across most of the countries were below USD 1 million per MW in 2017. The most updated reports provide that average global cost of wind turbines for the contracts signed in 1st Half of 2018 have fallen to around USD 0.85 million per MW. Beside turbine cost, the absolute amount and proportion of other components that constitute the total EPC cost as given in the referred reports was also analysed. EPC costs in China and India were also checked and found lowest in the world due to their local manufacturing, low cost of land and labour etc. For instance, there are states in India where the total EPC cost of even less than USD 0.80 million per MW has been allowed recently by their respective regulators. However, the Authority is of the view that the cases of any particular country cannot be made exact reference for Pakistan owing to differences in market conditions, local manufacturing bases, tariff regimes, performance targets and other technological and economic factors. The trend of decrease in EPC prices over last couple of years and reasons thereof were also examined. The competition among WTG suppliers has been reported as the primary factor for the decline in turbine prices and corresponding EPC cost of wind power projects. The variations in the cost of turbine having different hub heights, rotor diameters, nameplate capacity, origin of manufacturing were also analysed. The differences in the civil cost part of the project due to variations in the number and size of the turbines were also considered. The Authority further noted that margins for EPC contractor, transportation costs, level of performance being approved in this determination etc. should also be taken into account to set the EPC cost. After detailed analysis of the available information and factoring in all the aforesaid factors, the Authority has decided to approve the EPC cost of DEL as USD 57.940 million.

16. The allowed EPC cost is the maximum limit on overall basis. Applicable foreign portion of this cost, shall be allowed variations at Commercial Operations Date ("COD") due to change in PKR/USD parity during the allowed construction period, on production of authentic documentary evidence to the satisfaction of the Authority.

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Whether the details provided for Non-EPC cost are sufficient and claimed Non-EPC cost is justified? Also provide justification for land requirement as claimed by the petitioner.

17. The petitioner has claimed USD 9.250 million on account of non-EPC cost. Detail of non-EPC cost provided by the petitioner is hereunder:

Non-EPC Cost	(USD million)
Project Development cost	3.200
Insurance during construction	0.450
Financial fee and charges	2.100
Interest during construction	3.500
Total Non-EPC Cost	**9.250**

<u>Project Development Cost</u>

18. The petitioner has claimed Project Development Cost ("PDC") of USD 3.20 million. In its petition and during the hearing, the petitioner submitted that this claim includes the cost of feasibility and other studies, administrative costs, fixed assets and office setup cost, various regulatory fees, travelling expenses, cost of land and fees in relation to advisors of the project.

19. The petitioner submitted that the land lease for 325 acres has been signed with GOS on July 10, 2017. The petitioner has submitted the agreement of lease as per which it has already paid an amount of Rs. 9.75 million for the first 10 years lease.

20. The Authority has noted that PDC of around USD 3.5 million had been allowed in the earlier tariff cases of wind power projects. The Authority also referred the recent tariff cases of solar power projects of comparable size where the maximum PDC to the tune of USD 1.782 million has been allowed. Considering these details while accounting for the difference in construction period between solar and wind power projects, the Authority has decided to allow USD 2.5 million on account of PDC to the petitioner. This cost shall be adjusted at actual, up to the maximum allowed cost, based on production of verifiable documents at the time of COD.

<u>Insurance During Construction</u>

21. The petitioner has claimed USD 0.45 million on account of insurance during construction cost and requested to adjust this component at actual subject to a cap of 1% of claimed EPC cost at

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COD. Following insurance coverage has been indicated by the petitioner during the construction period:

a. Construction all risk insurances (CAR)
b. CAR delay in start-up insurance
c. Terrorism insurance
d. Marine and inland transit insurance
e. Marine – delay-in start-up insurance
f. Comprehensive general liability

22. The Authority has analysed the available data with respect to during construction insurance incurred by a number of wind power projects that have achieved COD. It has also been noted that in the recent tariff cases of solar power projects, the Authority has allowed pre-COD insurance at the maximum rate of 0.50% of the approved EPC cost. Based on these considerations, the Authority has decided to allow insurance during construction to the maximum of 0.5% of the approved EPC cost for the project as well which works out to be around USD 0.290 million. Insurance during construction shall be adjusted at actual, subject to allowed amount as maximum limit, at the time of COD on production of authentic documentary evidence to the satisfaction of the Authority.

Financial Fee & Charges

23. The petitioner has claimed USD 2.10 million on account of financial charges. DEL submitted that the claimed amount includes fees and charges related to lenders up-front fee, lenders advisors & agents charges, commitment fee, management fee, charges related to various Letter of Credit ("LC") to be established in favour of various contracting parties, fees payable and stamp duty applicable on the financing documents, agency fee, security trustee fee and other financing fees and charges. The petitioner further submitted that due to foreign financing by IFC, opening of LC in favour of EPC contractor is not required. However, in case the Company is required to provide LC confirmation cost then such costs shall be claimed at true-up on the basis of actual cost incurred.

24. It was noted that in earlier tariff determinations for wind power projects, the Authority had allowed financial fee & charges at the rate of 3% of the debt portion of capital expenditures

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(EPC, PDC, pre-COD insurance). In recent cost plus tariff determinations of solar power projects, financial fee & charges at the rate of 2.5% of the debt portion of capital expenditures has been allowed. Considering the recent standards, the Authority has decided to approve financing fee and charges with the cap of 2.5% of the allowed debt portion of the approved capital cost to DEL. Accordingly, the allowed amount under this head works out to be around USD 1.215 million. Financing charges shall be adjusted at actual, subject to allowed amount as maximum limit, at the time of COD on production of authentic documentary evidences to the satisfaction of the Authority.

Interest During Construction (IDC)

25. The petitioner has claimed interest during construction of USD 3.50 million for 18 month construction period which has been calculated on the basis of 3 month KIBOR of 6% plus spread of 2.50% and 3 month LIBOR of 0.6% plus spread of 4.5%. The petitioner submitted that actual IDC, however, shall be subject to change depending on the fluctuations in base rate, funding requirement (drawdowns) of the project during the construction period, changes in project cost including changes due to taxes and duties, and variations in PKR / USD exchange rate. The loan repayment period of thirteen years has been claimed by the petitioner. The terms of financing as well as period for construction being approved in this determination are discussed in the ensuing relevant sections. Based on the approved financing terms, construction period, capital cost including financing fee and charges while considering notional drawdowns of 20% in each quarter, the IDC works out to be USD 1.961 million which is hereby approved.

26. Recapitulating the above, the approved project cost under various heads is given hereunder:

Project Cost	(USD million)
EPC Cost	57.940
Project Development Cost	2.500
Insurance during construction	0.290
Financing Fee & Charges	1.215
Interest During Construction	1.961
Total	**63.906**

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Whether the claimed annual energy generation and corresponding plant capacity factor are reasonable and justified? And Whether the petitioner's proposed wind turbine technology satisfies the international standards of quality and operation?

27. The petitioner submitted the following technical parameters in this regard:

Project capacity	50 MW
Annual power generation	166,440 MWh
Net capacity factor	38%
Hub Height	93m
Rotor Diameter	114m
Name plate capacity (Each Turbine)	2 MW

28. The petitioner has claimed annual energy production of 166.440 GWh and corresponding net plant capacity factor of 38%. The petitioner submitted Wind Resource and Energy Yield Assessment Report ("Energy Report") conducted by the technical consultant hired by DEL.

29. The petitioner submitted that Gamesa is a global leader with 20 years' experience in the design, manufacture, installation and maintenance of wind turbines with over 28,800 MW installed in 43 countries across five continents. The petitioner submitted that in April, 2017 Siemens merged its wind power business with Gamesa. Siemens Wind Power and Gamesa now form a world-leading wind power provider in the name of "Siemens Gamesa Renewable Energy" with an unrivalled global presence with over 75 GW installed globally in more than 90 countries. The petitioner also submitted that the selected technology i.e. Siemens – Gamesa G114 – 2.0 is IEC certified and conforms to international engineering standards and all relevant environmental standards.

30. To assess this parameter of tariff, the Authority has analysed the data of energy yields of currently operational wind power plants in the country. The data of energy yields in different regions of the world and their trend in last couple of years has also been reviewed. It has been noted that worldwide, the capacity factors have improved as new machines are yielding better energy output within a given wind resource regime. These improvements have also been noted while comparing the energy production of old and newly commissioned wind power projects in Jhimpir region. It is found that the primary reason of these better results has been the change in turbine design through improvement in hub height, nameplate capacity and especially the enhancement in rotor diameters. For DEL also, it has been found that the mentioned three

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parameters are better than the turbines installed by the earlier wind power projects which are under operation in the country. Keeping in view these considerations while comprehensively analysing the information with respect to wind resource, location, technology etc. the Authority understands that the net annual plant capacity factor as claimed by the petitioner is quite on the lower side. The Authority is of the view that the yield numbers provided in the Energy Report at each probability level are quite conservative. As per the analysis of the Authority, it is considered that there exists high likelihood that the project can comfortably achieve yield better than given in the Energy Report even when compared with energy numbers at P50 level.

31. The Authority also noted the recent tariffs of three wind power projects were approved based on capacity factor results as assessed by the Authority. However, those project companies filed review motions primarily objecting the capacity factor approved in those determinations. In addition, the financiers such as Asian Development Bank and International Finance Corporation approached the Authority stating that it may not be viable for them to finance wind power projects on the basis as adopted by NEPRA to assess capacity factor. They requested the Authority that tariff of wind power projects should be set on a good probability level, preferably as given in their Energy Reports. They further submitted that the tariffs of wind power projects throughout the world are set on energy yield having higher possibility, mainly for financing purpose.

32. In view of these considerations and primarily to ensure the bankability of the project, the Authority has decided to set the tariff of DEL at net annual plant capacity factor of 38%. However, keeping in view the assessed potential of higher generation, the Authority has decided to approve the following sharing mechanism:

Net annual plant capacity factor	**% of prevalent tariff allowed to power producer**
Above 38% up to 40%	5%
Above 40% up to 42%	10%
Above 42% up to 44%	20%
Above 44% up to 46%	40%
Above 46% up to 48%	80%
Above 48%	100%

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Whether the claimed O&M costs are justified? Provide rationale of claiming foreign & local O&M cost.

33. The petitioner has claimed O&M cost of USD 1.95 million per annum i.e. USD 39,000 per MW per annum. The petitioner submitted the O&M contract for the initial 2 years (i.e. warranty period) signed with Hydrochina International Engineering Company Ltd. on December 07, 2017. The petitioner submitted that O&M cost caters for the cost of services rendered by the O&M operator and includes cost associated with replacement of parts necessitated due to regular operation/normal wear and tear. In addition, O&M cost also includes staff salaries, utilities, land lease, security and other related cost for operations of the project. The O&M cost has been claimed in the ratio of 31:69 for local and foreign costs respectively.

34. To evaluate the O&M cost claim of DEL, the Authority has considered the latest available O&M cost data in different parts of the world. The information given in the reports published by IRENA, Bloomberg and other sources have been relied upon. Furthermore, the tariff determinations approved by the regulators of countries in different regions have also been studied. The costs allowed by the Authority in previously determined wind power projects were also examined. Analysing all this data and particularly the trend of decrease in this cost component, the Authority is of the view that O&M cost of USD 1.95 million as claimed by DEL is not reasonable. The considerations made by the Authority for the assessment of the O&M costs to be allowed to the petitioner are given in the following paragraph.

35. The referred reports provide that the O&M cost has decreased sharply over the last couple of years and forecast further decrease in the upcoming years. The O&M cost of as low as USD 15,000 per MW per annum has been found in the referred sources for the initial term contracts. However, these sources qualify that O&M cost increases reasonably with turbines age as component failure becomes more common and manufacturer warranties expire. It has also been found that wind power projects being setup with larger turbines and more sophisticated design will have relatively lower overall O&M cost. The reported impact of size of project and turbines on the annual cost of O&M and differentials with their varying sizes was also analysed. O&M cost in India and China have also been checked and found to be lowest across different countries. Particularly in India, the O&M cost has been found in range of USD 10,000 per MW to USD 14,000 per MW in different states. Nevertheless, the Authority is cognizant of the fact that the

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costs of India and China cannot be replicated in Pakistan due to advanced development stage of wind industry in those countries and consequent available expertise in terms of manpower and required equipment as well as due to difference in tariff regimes. In addition, the Authority also noted that the level of performance being approved in this determination is relatively higher as compared to what is allowed in India and China which shall require more robust warranties from the O&M contractor that shall also result in comparatively higher O&M cost. Considering all these factors, the Authority has decided to approve O&M cost of USD 23,000 per MW per annum for DEL. In view of the claim of the petitioner and other project companies, the Authority has decided to share the approved O&M cost into local and foreign components in the ratio of 50:50.

Whether the claimed insurance during operation cost is justified?

36. The petitioner has claimed USD 0.39 million insurance during operation per annum. The petitioner submitted that insurance cost includes all-risk insurance/reinsurance, business interruption insurance, and machinery break-down, natural calamities, sabotage and terrorism. The petitioner submitted that the aforementioned insurances are required to be maintained throughout the life of the project. Since the Pakistan Insurance/Reinsurance industry does not have sufficient capacity and expertise to manage such huge risks entirely, therefore this risk is required to be insured/reinsured internationally.

37. The Authority has allowed insurance during operation at the rate of 0.4% of the EPC cost in the most recent determination of solar energy projects. The data of actual insurance of operational wind power projects has also been analysed for this purpose which shows that insurance during operation has been secured at the rate of even less than 0.4%. In view thereof, the Authority has decided to allow insurance during operation at maximum limit of 0.4% of the approved EPC cost to DEL. This cost shall be allowed adjustment on annual basis as per the mechanism given in the order part of this determination.

Whether the claimed return on equity is justified?

38. The petitioner claimed return on equity (ROE) of 15% (IRR basis) on invested equity net of withholding tax. The petitioner submitted that the withholding tax component has not been

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identified as a separate line item in the tariff as the same is assumed to be paid on all equity components i.e. ROE and ROEDC, at actual as a pass-through item under the tariff.

39. It was noted that over the passage of time, the Authority has revised the equity returns downward for a number of generation technologies keeping in view the developments in those sectors. The Authority has noted that nearly 1200 MWs of wind power projects have become operational. Further, it has been learnt that wind power projects having capacity of more than 2,000 MWs to be setup in Sindh have obtained LOIs from different facilitating agencies. This makes it quite clear that risk profile for developing wind projects especially in Sindh province has reduced considerably. Moreover, the Authority noted that a number of under process wind power companies have claimed ROE of even less than 14%. In view thereof, the Authority has decided to approve the ROE for the petitioner at the rate of 14%. Regarding the petitioner's claim of withholding tax on dividend, the Authority noted that it has principally decided not to allow this tax as pass through in any of the tariff cases.

Whether the claimed financing/debt terms are justified?

40. The petitioner has submitted that 50% foreign loan and 50% local loan shall be secured for the project based on debt to equity ratio of 75:25. The interest rate of LIBOR plus 4.5% and KIBOR plus 2.5% for foreign and local loans respectively has been claimed in the petition for the debt servicing period of thirteen years. The petitioner has submitted indicative term sheet signed with the lenders (Bank Alfalah, Meezan Bank and IFC) with the petition.

41. The Authority has considered the terms of financing being claimed by the petitioner. The Authority has noted that the State Bank of Pakistan ("SBP") has issued concessionary financing scheme in June, 2016. Under the said scheme, renewable energy projects having capacity of up to 50 MW can secure loan up to the limit of Rs. 6 billion at the rate of 6% for the minimum debt servicing tenor of ten years. The size of the project being setup by the petitioner is 50 MW which makes it eligible to avail financing under SBP scheme. The Authority has therefore decided to approve the reference tariff of DEL on the terms of financing scheme issued by SBP and hereby direct the petitioner to approach SBP for this purpose.

42. In case the petitioner is not able to secure financing under SBP scheme then the tariff of DEL shall be adjusted on conventional local/foreign financing, or a mix of both, at the time of its

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COD. However, the petitioner shall have to prove through documentary evidence issued by SBP/commercial bank that it exhausted the option of availing 100% financing under SBP scheme before availing part/full of conventional local/foreign loan. For conventional full/part of local loan, if any, the tariff of the petitioner shall be approved on applicable KIBOR plus spread of 2.25% and foreign loan on applicable LIBOR plus spread of 4.25%. For conventional loans, the term of debt servicing shall not be lesser than thirteen years.

43. The petitioner claimed tariff on debt: equity ratio of 75:25. The Authority has considered that a number of under process wind power projects have claimed their tariffs on debt: equity ratio of 80:20. Further, the Authority has considered that a number of benchmark/upfront tariff determinations of renewable power projects have been approved at the debt: equity ratio of 80:20. In view thereof, the Authority has decided to approve DEL's tariff on debt to equity proportion of 80:20. The approved debt: equity ratio shall remain same regardless of any form of financing secured by the petitioner.

Whether the claimed construction period is justified?

44. The petitioner has claimed eighteen months' time for the construction of the project. The Authority has noted that there are a number of under process wind power projects which are claiming construction period of fifteen months. In addition, it has also been seen that there are a number of operational wind projects that have been able to complete construction in fifteen month time. In view thereof, the Authority has decided to approve the construction period of fifteen months for the petitioner as well.

Any other issue with the approval of the Authority.

Comments of CPPA-G

45. CPPA-G submitted that NEPRA should review the proposal in the context of demand vs supply situation coupled with the quantum of renewable energy to be inducted in Grid according to the recommendations of Grid Code Review Panel ("GCRP") duly approved by NEPRA from time to time. CPPA-G also submitted that all the projects based on wind, solar, small hydel and bagasse energy will be awarded through competitive bidding as per Cabinet Committee on Energy ("CCE") decision.

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46. Regarding the submission of CPPA-G with respect to demand and supply position, it has been noted that NTDCL vide its letter dated June 23, 2017 submitted tentative demand supply analysis with the report namely Power Balance up to 2025. In that document, NTDCL submitted that it plans to evacuate 600 MW additional power from wind power projects in 2019-20 and further 500MW collectively from wind and solar power projects in 2020-21.

47. Regarding quantum of renewable energy induction in the Grid, the Authority has noted that as per approved Grid Code Addendum No. I (Revision-I) for Grid Integration of Wind Power Plants, the upper limit equal to 5% of the total installed grid-connected power capacity has been set for the integration of wind power plants. The Authority also noted that NTDCL has issued certificate of approval of the system studies of the project company on Dec 01, 2016. NTDCL in its approval letter also certified that the power to be generated by the project company will be evacuated by July 2019 and will not have any adverse effect on the national grid as required under the Grid Code. On the basis of that approval, the Authority has issued generation license to DEL on February 01, 2017.

48. Regarding award of tariff of renewable energy projects through competitive bidding, it was noted that vide its decision dated January 27, 2017 in the matter of Wind Power Generation Tariff, the Authority decided to allow induction of wind energy through competitive bidding and directed the relevant agencies to develop RFP for that purpose. Due to non-finalization of RFP by any agency after the lapse of considerable time period, the process of competitive bidding has not taken place. Further, the Authority through decision dated May 30, 2017 passed in the Review Motions of GOS clarified that submission of tariff petitions under the Tariff Rules, 1998 is permissible. Therefore, it may not be considered appropriate to stop entertaining applications under Tariff Rules, 1998 merely on the basis of the decision of CCE.

49. **ORDER**

In pursuance of section 7(3) (a) of the Regulation of Generation, Transmission and Distribution of Electric Power Act, 1997 read with NEPRA (Tariff Standards & Procedure) Rules, 1998, the Authority hereby determines and approves the following generation tariff along with terms and conditions for Din Energy Limited for its 50 MW wind power project for delivery of electricity to the power purchaser:

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Rs./kWh

Tariff Component	Year 1-10	Year 11-25
Operations and Maintenance Cost	0.8291	0.8291
Insurance during Operation	0.1671	0.1671
Return on Equity	1.4064	1.4064
Debt Servicing	4.9285	-
Total	**7.3311**	**2.4026**

- Levelized tariff works out to be US Cents 4.7824/kWh.
- EPC cost of USD 57.940 million has been considered.
- PDC cost of USD 2.500 million has been taken into account.
- Insurance during construction at the rate of 0.5% of the EPC cost has been approved.
- Financing charges at the rate of 2.5% of the debt portion of the capital cost has been approved.
- Net Annual Plant Capacity Factor of 38% has been approved.
- O&M Cost of USD 23,000 per MW per year has been approved.
- Debt to Equity of 80:20 has been used.
- Debt Repayment period of 10 years has been taken into account.
- The cost of financing of 6% for construction and operation has been used.
- Return on Equity of 14% has been allowed.
- Construction period of fifteen (15) months has been used for the workings of ROEDC and IDC.
- Insurance during Operation has been calculated as 0.4% of the allowed EPC Cost.
- Reference Exchange Rates of 120 PKR/USD has been used.
- The aforementioned tariff is applicable for twenty five (25) years from COD
- Detailed component wise tariff is attached as **Annex-I** of this decision.
- Debt Servicing Schedule is attached as **Annex-II** of this decision.

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A. One Time Adjustments at COD

- The EPC cost shall be adjusted at actual considering the approved amount as the maximum limit. Applicable foreign portion of the EPC cost will be adjusted at COD on account of variation in PKR/USD parity, on production of authentic documentary evidence to the satisfaction of the Authority. The adjustment in approved EPC cost shall be made only for the currency fluctuation against the reference parity values.

- The petitioner has submitted M/s DNV-GL certification No. TC-236603-A-2 date May 29, 2015 about the design, specification and country of origin of various component of the wind turbine to be installed for this project. At the time of COD stage tariff adjustments, the petitioner will have to provide a confirmation from the EPC contractor as to the fullest compliance of the equipment having same design and origin of manufacture as given in the type certificate. Where needed, the bill of lading and other support documents will also have to be submitted.

- PDC, Insurance during construction and Financing Fee and Charges shall be adjusted at actual at the time of COD considering the approved amount as the maximum limit. The amounts allowed on these accounts in USD will be converted in PKR using the reference PKR/USD rate of 120 to calculate the maximum limit of the amount to be allowed at COD.

- Duties and/or taxes, not being of refundable nature, relating to the construction period directly imposed on the company up to COD will be allowed at actual upon production of verifiable documentary evidence to the satisfaction of the Authority.

- IDC will be recomputed at COD on the basis of actual timing of debt draw downs (for the overall debt allowed by the Authority at COD) for the project construction period of fifteen months allowed by the Authority.

- For full/part of conventional local or foreign loans or a mix of both, if availed by the company, the IDC shall also be allowed adjustment for change in applicable KIBOR/LIBOR.

- The tariff has been determined on debt: equity ratio of 80:20. The tariff shall be adjusted on actual debt: equity mix at the time of COD, subject to equity share of not more than 20%. For equity share of more than 20%, allowed IRR shall be neutralized for the additional cost of debt: equity ratio.

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- The reference tariff has been worked out on the basis of cost of 6% offered under SBP financing scheme. In case cost negotiated by the company under SBP scheme is less than the said limit of 6%, the savings in that cost shall be shared between the power purchaser and the power producer in the ratio of 60:40 respectively.
- For full or part of local or foreign loan, if any, the savings in the approved spreads shall be shared between the power purchaser and power producer in the ratio of 60:40.
- ROEDC will be adjusted at COD on the basis of actual equity injections (within the overall equity allowed by the Authority at COD) for the project construction period of fifteen months allowed by the Authority.

B. Indexations

Adjustment of O&M, return on equity, return on equity during construction shall be made on quarterly basis for the quarters starting from 1st July, 1st October, 1st January and 1st April based on latest available information. Adjustment of Debt Servicing Component (if any) shall be made either quarterly or bi-annually depending upon the final terms approved by the Authority. For bi-annual adjustments, the periods shall start from 1st July and 1st January. Insurance component shall be adjusted on annual basis starting from either 1st January or 1st July. The indexation mechanisms are given hereunder:

i) Operation and Maintenance Costs

O&M components of tariff shall be adjusted based on revised rates of local Inflation (CPI) as notified by Pakistan Bureau of Statistics, foreign inflation (US CPI) as notified by US Bureau of Labour Statistics and TT&OD selling rate of US Dollar as notified by National Bank of Pakistan according to the following formula;

$F.\ O\&M_{(REV)}$	=	$F.\ O\&M_{(REF)} * US\ CPI_{(REV)} / US\ CPI_{(REF)} * ER_{(REV)}/ER_{(REF)}$
$L.\ O\&M_{(REV)}$	=	$L.\ O\&M_{(REF)} * CPI_{(REV)} / CPI_{(REF)}$
Where;		
$F.\ O\&M_{(REV)}$	=	The revised O&M Foreign Component of Tariff

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L. $O\&M_{(REV)}$	=	The revised O&M Local Component of Tariff
F. $O\&M_{(REF)}$	=	The reference O&M Foreign Component of Tariff
L. $O\&M_{(REF)}$	=	The reference O&M Local Component of Tariff
US $CPI_{(REV)}$	=	The revised US CPI (All Urban Consumers)
US $CPI_{(REF)}$	=	The reference US CPI (All Urban Consumers) of 252.146 of August, 2018
$CPI_{(REV)}$	=	The revised CPI (General)
$CPI_{(REF)}$	=	The reference CPI (General) of 229.27 for the month of August, 2018
$ER_{(REV)}$	=	The revised TT & OD selling rate of US dollar
$ER_{(REF)}$	=	The reference TT & OD selling rate of RS. 120/USD

Note: The reference indexes shall be revised after making the required adjustments in tariff components at the time of COD.

ii) **Insurance during Operation**

The actual insurance cost for the minimum cover required under contractual obligations with the Power Purchaser, not exceeding 0.4% of the approved EPC cost, will be treated as pass through. Insurance component of reference tariff shall be adjusted annually as per actual upon production of authentic documentary evidence according to the following formula:

AIC	=	$Ins_{(Ref)} / P_{(Ref)} * P_{(Act)}$
Where;		
AIC	=	Adjusted insurance component of tariff
$Ins_{(Ref)}$	=	Reference insurance component of tariff
$P_{(Ref)}$	=	Reference premium @ 0.4% of approved EPC Cost at Rs. 120
$P_{(Act)}$	=	Actual premium or 0.4% of the approved EPC Cost converted into Pak Rupees on exchange rate prevailing at the time of insurance premium payment of the insurance coverage period whichever is lower

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iii) **Return on Equity**

The total ROE (ROE + ROEDC) component of the tariff will be adjusted on quarterly basis on account of change in USD/PKR parity. The variation relating to these components shall be worked out according to the following formula;

$ROE_{(Rev)}$	=	$ROE_{(Ref)}$ * $ER_{(Rev)}$/ $ER_{(Ref)}$
Where;		
$ROE_{(Rev)}$	=	Revised ROE Component of Tariff
$ROE_{(Ref)}$	=	Reference ROE Component of Tariff
$ER_{(Rev)}$	=	The revised TT & OD selling rate of US dollar as notified by the National Bank of Pakistan
$ER_{(Ref)}$	=	The reference TT & OD selling rate of Rs. 120/USD

Note: The reference tariff component shall be revised after making the required adjustments at the time of COD.

iv) **Indexations applicable to debt**

For full or part of conventional foreign debt, if any, respective principle and interest components will be adjusted on quarterly/bi-annual basis, on account of revised TT & OD selling rate of US Dollar, as notified by the National Bank of Pakistan as at the last day of the preceding quarter, over the applicable reference exchange rate. The interest part of the foreign loan shall be allowed adjustment with respect to change in the applicable LIBOR. For full or part of conventional local loan, if any, the interest component shall be allowed adjustment with respect to change in applicable KIBOR.

C. Terms and Conditions

The following terms and conditions shall apply to the determined tariff:

- All plant and equipment shall be new and of acceptable standards. The verification of the plant and equipment will be done by the independent engineer at the time of the commissioning of the plant duly appointed by the power purchaser.

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- This tariff will be limited to the extent of net annual energy generation supplied to the power purchaser up to 38% net annual plant capacity factor. Net annual energy generation supplied to the power purchaser in a year, in excess of 38% net annual plant capacity factor will be charged at the following tariffs:

Net annual plant capacity factor	**% of prevalent tariff allowed to power producer**
Above 38% up to 40%	5%
Above 40% up to 42%	10%
Above 42% up to 44%	20%
Above 44% up to 46%	40%
Above 46% up to 48%	80%
Above 48%	100%

- The petitioner is required to ensure that all the equipment is installed as per the details/specifications provided in the determination. Any change in the power curve of the turbines as provided in studies along with the petition and the relevant assumptions contained therein shall not be allowed.

- The petitioner is required to maintain the availability levels as declared in the Tariff Petition and the studies provided therein. Necessary clauses shall be included in the EPA so that the power producer cannot intentionally suppress the capacity factors. NPCC shall conduct detailed monitoring/audit of the operational record/log of all the wind turbines on quarterly basis to verify output/capacity of the power plant.

- The risk of wind resource shall be borne by the power producer.

- In the tabulated above tariff no adjustment for certified emission reductions has been accounted for. However, upon actual realization of carbon credits, the same shall be distributed between the power purchaser and the power producer in accordance with the applicable GOP Policy, amended from time to time.

- The savings in the cost under SBP scheme during the loan tenor shall be shared between the power purchaser and power producer in the ratio of 60:40.

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- In case the company shall secure full or part of local conventional loan then the tariff of company shall be adjusted at the time of COD at applicable KIBOR + spread of 2.25%. The savings in the approved spreads during the loan tenor shall be shared between the power purchaser and power producer in the ratio of 60:40. The tenor of the debt servicing shall not be less than thirteen years for this loan.

- In case the company shall secure full or part of foreign conventional loan then the tariff of company shall be adjusted at the time of COD at applicable LIBOR + spread of 4.25%. The savings in the approved spreads during the loan tenor shall be shared between the power purchaser and power producer in the ratio of 60:40. The tenor of the debt servicing shall not be less than thirteen years for this loan.

  In case the company shall secure foreign loan under any credit insurance (Sinosure etc.) then the cost of that insurance shall be allowed to the maximum limit of 0.6% of the yearly outstanding principal and interest amounts. For that purpose, the spread over that full/part of loan shall be considered as 3.5% as the maximum limit. The savings in the spread during the loan tenor shall be shared between the power purchaser and power producer in the ratio of 60:40.

- The company will have to achieve financial close within one year from the date of issuance of this determination. The tariff granted to the company will no longer remain applicable/valid, if financial close is not achieved by the company in the abovementioned timeline or its generation license is declined/revoked by NEPRA.

- The targeted maximum construction period after financial close is fifteen months. No adjustment will be allowed in this tariff to account for financial impact of any delay in project construction. However, the failure of the company to complete construction within fifteen months will not invalidate the tariff granted to it.

- Pre COD sale of electricity is allowed to the project company, subject to the terms and conditions of Energy Purchase Agreement, at the applicable tariff excluding principal repayment of debt component and interest component. However, pre COD sale will not

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alter the required commercial operations date stipulated by the Energy Purchase Agreement in any manner.

- In case the company is obligated to pay any tax on its income from generation of electricity, or any duties and/or taxes, not being of refundable nature, are imposed on the company, the exact amount paid by the company on these accounts shall be reimbursed on production of original receipts. This payment shall be considered as a pass-through payment. However, withholding tax on dividend shall not be a pass through item.

- No provision for the payment of Workers Welfare Fund and Workers Profit Participation has been made in the tariff. In case, the company has to pay any such fund, that will be treated as pass through item in the EPA.

- The approved tariff along with terms & conditions shall be made part of the EPA. General assumptions, which are not covered in this determination, may be dealt with as per the standard terms of the EPA.

50. The Order part along with two Annexures is recommended for notification by the Federal Government in the official gazette in accordance with Section 31(7) of the Regulation of Generation, Transmission and Distribution of Electric Power Act, 1997.

AUTHORITY

(Saif Ullah Chattha)
Member 31.10.2018

(Rehmatullah Baloch)
Vice Chairman
31/X/2018

(Brig (R) Tariq Saddozai)
Chairman

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Annex-I

DIN ENERGY LIMITED
REFERENCE TARIFF TABLE

Year	Foreign O&M	Local O&M	Insurance	Return on Equity	ROEDC	Loan Repayment	Interest Charges	Tariff
	Rs. / kWh	Rs. / kWh	Rs. / kWh	Rs. / kWh	Rs. / kWh	Rs. / kWh	Rs. / kWh	Rs. / kWh
1	0.4146	0.4146	0.1671	1.2901	0.1163	2.7786	2.1499	7.3311
2	0.4146	0.4146	0.1671	1.2901	0.1163	2.9491	1.9793	7.3311
3	0.4146	0.4146	0.1671	1.2901	0.1163	3.1301	1.7984	7.3311
4	0.4146	0.4146	0.1671	1.2901	0.1163	3.3222	1.6063	7.3311
5	0.4146	0.4146	0.1671	1.2901	0.1163	3.5260	1.4024	7.3311
6	0.4146	0.4146	0.1671	1.2901	0.1163	3.7424	1.1861	7.3311
7	0.4146	0.4146	0.1671	1.2901	0.1163	3.9721	0.9564	7.3311
8	0.4146	0.4146	0.1671	1.2901	0.1163	4.2158	0.7127	7.3311
9	0.4146	0.4146	0.1671	1.2901	0.1163	4.4745	0.4540	7.3311
10	0.4146	0.4146	0.1671	1.2901	0.1163	4.7491	0.1794	7.3311
11	0.4146	0.4146	0.1671	1.2901	0.1163	-	-	2.4026
12	0.4146	0.4146	0.1671	1.2901	0.1163	-	-	2.4026
13	0.4146	0.4146	0.1671	1.2901	0.1163	-	-	2.4026
14	0.4146	0.4146	0.1671	1.2901	0.1163	-	-	2.4026
15	0.4146	0.4146	0.1671	1.2901	0.1163	-	-	2.4026
16	0.4146	0.4146	0.1671	1.2901	0.1163	-	-	2.4026
17	0.4146	0.4146	0.1671	1.2901	0.1163	-	-	2.4026
18	0.4146	0.4146	0.1671	1.2901	0.1163	-	-	2.4026
19	0.4146	0.4146	0.1671	1.2901	0.1163	-	-	2.4026
20	0.4146	0.4146	0.1671	1.2901	0.1163	-	-	2.4026
21	0.4146	0.4146	0.1671	1.2901	0.1163	-	-	2.4026
22	0.4146	0.4146	0.1671	1.2901	0.1163	-	-	2.4026
23	0.4146	0.4146	0.1671	1.2901	0.1163	-	-	2.4026
24	0.4146	0.4146	0.1671	1.2901	0.1163	-	-	2.4026
25	0.4146	0.4146	0.1671	1.2901	0.1163	-	-	2.4026
Levelized Tariff	**0.4146**	**0.4146**	**0.1671**	**1.2901**	**0.1163**	**2.3818**	**0.9545**	**5.7388**

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Annex-II

DIN ENERGY LIMITED
DEBT SERVCING SCHEDULE

Relevant Quarters	Base amount (USD)	Principal Repayment (USD)	Interest (USD)	Balance Principal (USD)	Total Debt Service (Million USD)	Annual Principal Repayment Rs./kWh	Annual Interest Rs./kWh
1	51,124,729	942,081	766,871	50,182,649	1,708,952	2.7786	2.1499
2	50,182,649	956,212	752,740	49,226,437	1,708,952		
3	49,226,437	970,555	738,397	48,255,882	1,708,952		
4	48,255,882	985,113	723,838	47,270,769	1,708,952		
5	47,270,769	999,890	709,062	46,270,879	1,708,952	2.9491	1.9793
6	46,270,879	1,014,888	694,063	45,255,990	1,708,952		
7	45,255,990	1,030,112	678,840	44,225,879	1,708,952		
8	44,225,879	1,045,563	663,388	43,180,315	1,708,952		
9	43,180,315	1,061,247	647,705	42,119,069	1,708,952	3.1301	1.7984
10	42,119,069	1,077,166	631,786	41,041,903	1,708,952		
11	41,041,903	1,093,323	615,629	39,948,580	1,708,952		
12	39,948,580	1,109,723	599,229	38,838,857	1,708,952		
13	38,838,857	1,126,369	582,583	37,712,489	1,708,952	3.3222	1.6063
14	37,712,489	1,143,264	565,687	36,569,224	1,708,952		
15	36,569,224	1,160,413	548,538	35,408,811	1,708,952		
16	35,408,811	1,177,819	531,132	34,230,992	1,708,952		
17	34,230,992	1,195,487	513,465	33,035,505	1,708,952	3.5260	1.4024
18	33,035,505	1,213,419	495,533	31,822,086	1,708,952		
19	31,822,086	1,231,620	477,331	30,590,466	1,708,952		
20	30,590,466	1,250,095	458,857	29,340,372	1,708,952		
21	29,340,372	1,268,846	440,106	28,071,526	1,708,952	3.7424	1.1861
22	28,071,526	1,287,879	421,073	26,783,647	1,708,952		
23	26,783,647	1,307,197	401,755	25,476,450	1,708,952		
24	25,476,450	1,326,805	382,147	24,149,645	1,708,952		
25	24,149,645	1,346,707	362,245	22,802,938	1,708,952	3.9721	0.9564
26	22,802,938	1,366,907	342,044	21,436,031	1,708,952		
27	21,436,031	1,387,411	321,540	20,048,620	1,708,952		
28	20,048,620	1,408,222	300,729	18,640,398	1,708,952		
29	18,640,398	1,429,346	279,606	17,211,052	1,708,952	4.2158	0.7127
30	17,211,052	1,450,786	258,166	15,760,266	1,708,952		
31	15,760,266	1,472,548	236,404	14,287,719	1,708,952		
32	14,287,719	1,494,636	214,316	12,793,083	1,708,952		
33	12,793,083	1,517,055	191,896	11,276,028	1,708,952	4.4745	0.4540
34	11,276,028	1,539,811	169,140	9,736,217	1,708,952		
35	9,736,217	1,562,908	146,043	8,173,308	1,708,952		
36	8,173,308	1,586,352	122,600	6,586,957	1,708,952		
37	6,586,957	1,610,147	98,804	4,976,809	1,708,952	4.7491	0.1794
38	4,976,809	1,634,299	74,652	3,342,510	1,708,952		
39	3,342,510	1,658,814	50,138	1,683,696	1,708,952		
40	1,683,696	1,683,696	25,255	(0)	1,708,952		

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