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Islamic Republic of Pakistan

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No. NEPRA/R/ADG(Trf))/TRF-519/SSPL-2019/2883-2885
January 26, 2021

Subject: **Determination of National Electric Power Regulatory Authority in the matter of Tariff Petition filed by M/s. Safe Solar Power (Pvt.) Ltd. for Determination of Generation Tariff in respect of 10.275 MWp Solar PV Power Project** – (Case No. NEPRA/TRF-519/SSPL-2019)

Dear Sir,

Please find enclosed herewith subject Determination of the Authority along with Annex-I & II (27 Pages) in Case No. NEPRA/TRF-519/SSPL-2019.

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 along with Annex-I & II of the Authority Determination is to be notified in the Official Gazette.

Enclosure: As above

26.01.21

(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 NATIONAL ELECTRIC POWER REGULATORY AUTHORITY IN THE MATTER OF TARIFF PETITION FILED BY M/S SAFE SOLAR POWER (PRIVATE) LIMITED FOR DETERMINATION OF GENERATION TARIFF IN RESPECT OF 10.275 MWp SOLAR PV POWER PROJECT

1. M/s Safe Solar Power (Pvt.) Limited ("SSPPL" or "the petitioner" or "the company/project company") filed a tariff petition before National Electric Power Regulatory Authority ("NEPRA" or "the Authority") on December 19, 2019 for determination of generatian tariff in respect of its 10.275 MWp Solar PV Power Project ('the Project") to be set up at Dharanwala, District Bhawalnagar, Punjab. The said petition was filed by SSPPL under Section 31 of the Regulation of Generation, Transmission and Distribution of Electric Power Act, 1997 ("NEPRA Act") read with Rule 3 of NEPRA (Tariff Standards & Procedure) Rules, 1998 ("Tariff Rules") and other applicable provisions of the NEPRA law. The petitioner requested for the appraval of levelized tariff of US Cents 5.48/kWh over the tariff control period of 25 years.

2. The petitioner submitted that it is an entity incorporated under the Companies Ordinance, 1984 to act as a Special Purpose Vehicle to develop a solar PV power project. In this regard, SSPPL submitted a copy of its incorporation certificate issued by Securities and Exchange Commission of Pakistan ("SECP") dated January 7, 2014, along with the petition.

3. The petitioner submitted that it was issued Letter of Intent ("LOI") by Alternative Energy Development Board ("AEDB") on January 13, 2014 for establishing an approximately 10 MW solar PV power generation project. The said LOI was issued in accordance with the Government of Pakistan's Policy for Development of Renewable Energy for Power Generation, 2006 ("RE Policy, 2006"). SSPPL submitted that pursuant to the conditions of the said LOI, the company achieved all its milestones well within time and was awarded upfront tariff by the Authority. SSPPL submitted that subsequent to receiving the upfront tariff on April 22, 2015, the company obtained the Letter of Support ("LOS") from AEDB on July 01, 2015. During proceedings of the subject tariff petition, AEDB sent a letter dated September 02, 2020 whereby extension in the validity period of LOS was granted to SSPPL up to December 01, 2020. The petitioner submitted that as per decision of the Cabinet Committee on Energy's ("CCoE") communicated on April 4, 2019, the Project is placed at Sr.#4 in the Category-I.

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4. NEPRA granted the Generation License to SSPPL on September 12, 2014. Thereafter, the Modification-I in Generation License was approved on February 24, 2016. Subsequently, the company filed Licensee Proposed Modification-II for change in technology, which was approved by NEPRA on November 17, 2020.

5. Summary of the key information as provided in the tariff petition is as follows:

Project Company	:	Safe Solar Power (Pvt.) Ltd.
Sponsor	:	Mr. Hamid Mir
Capacity	:	~10.2 MWp
Project Location	:	Bhawalnagar, Punjab
Land Area	:	50 Acres
Concession Period	:	25 years from Commercial Operations Date
Purchaser	:	Central Power Purchasing Agency (Guarantee) Ltd.
EPC Contractors	:	Reon Energy Ltd.
PV Modules	:	Bifacial Trina Solar or equivalent
Mounting Structure	:	Single Axis Tracking
Inverters	:	Sungrow 110KW or larger
Construction Period	:	6 months
Annual Energy Production	:	18.7 GWh
Plant Capacity Factor	:	20.5%
Project Cost		**USD in millions**
EPC Cost	:	7.501
Pre-COD Insurance	:	0.034
Project Development Cost	:	0.616
Operating Fixed Assets & Land	:	0.513
Additional Project Cost	:	0.200
Capitalized Degradation	:	0.271
Financing Fee & Charges	:	0.060

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Interest during Construction	:	0.080	
Total Project Cost	:	**9.275**	
Financing Structure	:	Debt: 75% : Equity: 25%	
Debt Composition	:	100% local	
Interest Rate	:	SBP Rate (3% + spread 3%)	
Debt Repayment	:	10 years	
Return on Equity	:	16%	
Annual O&M Cost	:	USD 12,000 per MW	
Annual Insurance Cost	:	1% of EPC Cost	
Tariff:		**Rs./kWh**	**US Cents/kWh**
Levelized (1-25 years)	:	8.5488	5.48
Exchange rate	:	1 USD = PKR 156	

6. The Authority considered the tariff petition on January 14, 2020 and decided to admit the same for further processing. Accordingly, Notice of Admission & Hearing in the instant case was published in the daily national newspapers on March 3, 2020 stating hearing date as March 18, 2020, to be conducted at NEPRA Tower Islamabad, while also providing salient features of the petition, issues framed for hearing and invitation for filing comments/intervention request from the interested parties. Tariff petition and Notice of Admission & Hearing were also hosted on NEPRA's website (www.nepra.org.pk) for information of general public.

7. Subsequently, the Authority re-scheduled the hearing on the subject matter for April 1, 2020. Accordingly, the Notice of re-scheduling of hearing was published in the daily national newspapers on March 17, 2020. However, the Authority through advertisement published in national daily newspapers on March 19, 2020 announced that all the scheduled hearings at NEPRA Tower Islamabad have been postponed as a precautionary measure against COVID-19.

8. Later on, the Authority re-scheduled the hearing of subject tariff petition for June 4, 2020, to be conducted Online via Zoom. The Notice of that hearing was published in the daily national newspapers on May 23, 2020. Individual Notices of Admission & Hearing were also

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sent to the stakeholders, considered relevant by NEPRA, and to the petitioner on May 21, 2020 for participation in the hearing. The revised Notice of Hearing was also hosted on NEPRA's website (www.nepra.org.pk) for information of general public.

9. Following issues were framed by the Authority for the hearing/proceedings:

- Whether the claimed EPC cost is competitive, 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?
- 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?
- Whether the claimed O&M costs are justified?
- Whether the claimed insurance during operation cost is justified?
- Whether the claimed return on equity is justified?
- Whether the claimed financing/debt terms are justified?
- Whether the claimed annual energy generation and corresponding plant capacity factor are reasonable and justified? and
- Whether the petitioner's proposed solar modules technology satisfies the international standards of quality and operation?
- Whether the project grid interconnection study is approved by the relevant organization(s) and whether NTDCL has issued power evacuation certificate?
- Whether the claimed construction period is justified?
- Any other issue with the approval of the Authority

10. The hearing was held on June 4, 2020 (Thursday) at 11:00 A.M. via Zoom which was attended by a number of participants including the petitioner, and other stakeholders. In response to Notice of Admission/Hearing, no comments or intervention request were received from any party.

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

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Whether the claimed EPC cost is competitive, 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?

12. The petitioner has claimed USD 7.501 million on account of Engineering, Procurement and Construction ("EPC") cost in its tariff petition. Break-up of EPC cost as provided by the petitioner in the tariff petition is hereunder:

EPC Cost	USD Million
Offshore EPC Cost	5.626
Onshore EPC Cost	1.875
Total EPC cost	**7.501**

13. SSPPL in the petition submitted that the claimed EPC cost is the turnkey price for the complex. For that purpose, the petitioner submitted a copy of EPC Agreement-Term Sheet signed with EPC Contractor namely Reon Energy Limited ("REL") for both Offshore Services & Equipment Supply and Onshore Services & Equipment Supply on lump sum fixed price of USD 7.798 million. Regarding the query of difference between the EPC cost claimed in the tariff petition and agreed in EPC Term Sheet, the petitioner through email communication dated September 16, 2020 submitted that prior to hearing of tariff petition, SSPPL was able to bring prices down. The scope of offshore and onshore services to be provided by the EPC Contractor are detailed in the EPC Agreement-Term Sheet.

14. On a per MW basis, the petitioner has claimed EPC cost of USD 0.730 million. Break-up of EPC cost as claimed by the petitioner in the tariff petition is as hereunder:

Claimed EPC Cost	USD (Million)	USD (Million/MW)
Module	3.083	0.300
Inverter	0.411	0.040
Mounting structure	1.541	0.150
Balance of Plant	2.466	0.240
Total EPC Cost	**7.501**	**0.730**

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15. SSPPL in the petition and during the hearing submitted that it has selected bifacial mono crystalline modules from Tier-1 manufacturer as they provide the maximum efficiency and output. The petitioner submitted that panel price has been targeted at USD 0.30 million per MW as opposed to claims of USD 0.31 – 0.33 million per MW made by other solar PV projects namely HNDS and P&G respectively. It submitted that although it is a very aggressive target but the project company is positive to achieve it. Regarding inverters, the petitioner submitted that it has used same price of inverter which has been benchmarked by NEPRA, i.e. USD 0.04 million per MW. For mounting structure, SSPPL submitted that it will be developing the Project on single axis mounting-structure which is based on latest technology and help achieve best output from bi-facial panels. SSPPL informed that P&G and HNDS have asked for mounting structure price of USD 0.15 - 0.17 million per MW, however, SSPPL has target this cost at USD 0.15 million per MW in line with its strategy for cost optimization. For balance of plant, the petitioner has claimed the cost of USD 0.240 million per MW.

16. During hearing, the petitioner apprised the Authority that it had been provided with a Tariff and LOS in 2015, i.e. before the issuance of NEPRA (Selection of Engineering, Procurement and Construction Contractor by Independent Power Producers) Guidelines, 2017 ("EPC Guidelines, 2017"). SSPPL informed that the process followed for the selection of the EPC contractor at that time mirrored the EPC Guidelines, in principle. It further submitted that following the Government of Pakistan letter allowing the continuation of Project in April 2019, the EPC Contractor, as selected earlier, was asked to provide new quotes in line with the latest technological and commercial numbers. The petitioner submitted that based on the said quotations and in line with the tariffs allowed by NEPRA to the other solar PV projects, this instant tariff has been developed.

17. As stated above, the petitioner has not followed the EPC Guidelines, 2017 for selection of EPC contractor. It is also noted that tariff determinations of thirteen (13) solar PV projects have been issued by NEPRA in last few months. Looking at the EPC costs approved in those determinations and prevailing prices of equipment, it is considered that the EPC cost claim of the petitioner is on the higher side. In view thereof, the Authority has decided to assess the EPC cost to be allowed to SSPPL and basis thereof is given in the following paragraphs.

18. The Authority has relied upon the EPC cost and project cost data in different countries. The prices of different types of modules, inverters and mounting structures in different parts of

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the world were researched through a number of reports published by credible organizations. Moreover, a number of online sources providing spot prices data of equipment of solar power system were also surfed. Furthermore, the costs approved recently for other comparable projects were also checked. It has been noted that the average prices of solar modules of different types and brands have gone as low as USD 0.18 million per MW. Those average prices were at the level of USD 0.32-0.34 million per MW back in January, 2018. This shows that there has been a decline of more than 50% in the cost of modules in two years' time. The cost of inverters inclusive of combiner boxes, has been found reported in different sources and has been claimed in other tariff petitions at or below the level of USD 0.04 million per MW. For mounting structures, the price of as low as USD 0.10 million per MW for single axis tracking has been stated by one of the solar projects. On these base figures, the factors such as transportation cost, existing local market conditions, local manufacturing base, length of time allowed for achieving financial close etc. were given due consideration. Further, the cost of civil works as allowed by the Authority in the comparable tariff cases has been rationalized for the size and site specific features of the Project. The cost of electrical balance of plant equipment has been allowed in line with the comparable projects. It has also been ensured to provide a reasonable amount of profits/margins to the companies carrying out above work. Keeping in view all these factors, the Authority has assessed the EPC cost for SSPPL as USD 0.5700 million per MW (USD 5.857 million) which is hereby approved. The allowed EPC cost shall be adjusted at Commercial Operations Date ("COD") in accordance with the mechanism given in the Order part of this determination.

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?

19. The petitioner has claimed USD 1.775 million on account of Non-EPC cost. The break-up of the cost components as provided by the petitioner is as follows:

Non-EPC Cost	USD Million
Insurance during Construction	0.034
Project Development Cost	0.616
Additional Project Cost (Post LOS)	0.200

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Operating Fixed Assets & Land	0.513
Capitalized Degradation	0.272
Financing Fee and Charges	0.060
Interest during Construction	0.080
Total	**1.775**

Insurance during Construction

20. The petitioner has claimed USD 0.034 million on account of pre-COD insurance cost. The claim of the petitioner works out to be around 0.45% of the claimed EPC cost. During hearing, the petitioner has submitted that it intends to procure the following insurances during the construction phase of the Project:

- Construction All Risk insurances (CAR)
- CAR delay in start-up insurance
- Terrorism insurance
- Marine and inland transit insurance
- Marine – delay-in Startup insurance
- Comprehensive general liability

21. The Authority has noted that NEPRA (Benchmarks for Tariff Determination) Guidelines, 2018 ("Benchmarking Guidelines") issued vide S.R.O. 763(I)/2018 notification dated June 19, 2018 states the provision of insurance during construction at the rate of 0.40% of EPC cost for solar PV projects. In accordance therewith, the Authority has decided to allow insurance during construction, inclusive of taxes, charges and/or duties, at the rate of 0.4% of the approved EPC cost to SSPPL. On this basis, the amount being approved under this head works out to be around USD 0.023 million.

Project Development Cost

22. The petitioner in its petition and during hearing has claimed USD 0.816 million on account of Project Development Cost ("PDC"). The details of the items that have been clubbed under the PDC are given hereunder:

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Project Development Cost	USD Million
Project Development Cost	0.616
Additional Project cost (Post LOS)	0.200
Total	**0.816**

23. The petitioner submitted that PDC includes costs incurred in developing the Project and in taking it to financial close such as costs of project studies, company formation, issuing shares, regulatory fees, rent, utilities, salaries & wages, travelling, communication, power purchaser Letter of Credit ("LC") charges, purchase of vehicles, computer & software & other miscellaneous office expense. This cost also includes advisory and consultancy fees (legal, HSE, audit, tax, insurance etc.). Additionally, the petitioner informed that this head includes cost of EPC management team overseeing the Project during construction based on quotes received from service provider. The petitioner also informed telephonically that security cost is also part of the claimed PDC.

24. SSPPL has also claimed an additional PDC of USD 0.200 million. In this regard, the petitioner stated that this additional cost has been claimed due to the fact that the Project was delayed for four years after getting its LOS. It stated that the aforesaid delay was due to public entities reluctance. During the hearing, the petitioner apprised the Authority that the project company has been bearing PDC on account of human resource and management costs for the last four years since the LOS was awarded to it.

25. The Authority has examined the PDC which has been allowed in tariffs of comparable solar PV projects. Considering the said information while taking into account the size of the Project, the Authority has decided to approve the PDC of USD 0.240 million (Rs. 40 million) for SSPPL, inclusive of all the costs to be incurred under this head. This amount is being approved on lump sum basis, i.e. the costs incurred on individual heads of PDC may change but should not exceed the overall amount. The Authority also considered the submission of SSPPL with respect to additional PDC claim of USD 0.200 million. It was noted that the reluctance of the public sector entities, as stated by SSPPL, was not challenged by petitioner at any forum available to them. Therefore, the Authority is not convinced with the submissions of the petitioner and decided not to allow claim of additional PDC.

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Operating Fixed Assets & Land

26. SSPPL has claimed USD 0.513 million on account of operating fixed assets and land cost. With respect to land, the petitioner submitted that it has purchased 50 acres area for developing the Project. The petitioner submitted that the claimed cost includes cost of 50 acres of land as well as associated taxes, stamp duties and government charges required for setting up the Project. In support of its claim, SSPPL submitted a signed copy of Land Sale Agreement executed between SSPPL and the landowner Mr. Hamid Mir on January 7, 2020 for purchase of land of 400 kanals (equivalent to 50 acres), during proceedings. The land is located at Dharanwala, Chistian, District Bhawalnagar. As per the Sale Agreement, total cost of land comes out to be Rs. 18.026 million (PKR 360,520 per acre), including stamp charges of Rs. 0.526 million. The Sale Agreement further states that total sale consideration amount has been paid to the landowner on January 7, 2020 through a cheque. The Authority considered all the above details and the land cost that has been allowed in the comparable projects and is of the view that the claimed cost of land is reasonable and decided to allow the same i.e. USD 0.108 million. With respect to the claim of operating fixed assets, the Authority has noted that no justifications/details were provided by the petitioner in this regard. Furthermore, the Authority noted that the cost of operating fixed assets has not been allowed in the tariff of any solar PV projects, hence, not been considered for the SSPPL also.

Financing Fee and Charges

27. SSPPL has claimed financing fees and charges of USD 0.060 million. In this regard the petitioner submitted that that tariff model has been run on the financing scheme of State Bank of Pakistan ("SBP Scheme") for renewable energy projects available at total cost of 6% comprising of SBP share of 3% and bank spread of 3%. The petitioner requested the Authority that financing fees and charges be actualized at COD based on actual debt levels.

28. It is noted that Benchmarking Guidelines states the provision of financing fee & charges not exceeding 2% of the approved debt amount of the capital expenses (EPC cost, PDC, Insurance during construction). In accordance with the said benchmark, the Authority has decided to allow the captioned cost at the rate of 2% of approved debt portion of allowed

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capital expenses, inclusive of taxes, charges and/or duties, to the petitioner. Accordingly, the amount being approved under this head works out to be around USD 0.100 million.

Interest during construction (IDC)

29. The petitioner has submitted that Interest during Construction ("IDC") has been calculated as USD 0.080 million based on 6 month construction period. The petitioner further submitted that IDC shall be actualized at COD as per actual debt drawdown profile, LIBOR/KIBOR rate and local and foreign debt split, if applicable. For the workings of the claimed amount of IDC, the petitioner has used the following:

6 month SBP Rate	3%
Spread	3%
Total interest rate	6%

30. Based on the abovementioned approved costs while considering the drawdown schedule as given in the Order part of this determination; the IDC works out to be around USD 0.075 million and is hereby approved. The details of financing terms and construction period that have been used to work out the aforesaid amount of IDC is discussed in the ensuing relevant sections. The allowed IDC shall be re-computed at COD as per the mechanism given in the Order part of this determination.

31. Recapitulating above, the approved project cost is given hereunder:

Project Cost	USD million
EPC Cost	5.857
Project Development Cost	0.240
Land Cost	0.108
Insurance during Construction	0.023
Financing Fee and Charges	0.100
Interest during Construction	0.075
Total	**6.403**

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Whether the claimed O&M costs are justified?

32. SSPPL has claimed O&M cost of USD 12,000 per MW per year (USD 0.1233 million/year). Out of the total claim, 60% has been denominated in local currency and 40% is claimed in foreign currency (USD). The petitioner submitted that variable part of O&M cost consists of replacement cost of some imported spare parts on completion of their service life or in case of premature failure (unscheduled maintenance) and technical services obtained from local and foreign experts during maintenance. Local-fixed O&M cost includes O&M staff costs and administrative cost of the Project including remuneration to non-technical employees, rents and utilities. It also includes security, transportation, professional fees (audit, tax and legal) and contract services. Foreign fixed O&M includes costs for obtaining technical services and costs of major overhauls including spares, consumables and miscellaneous administration expense. The petitioner requested to index the O&M component on a quarterly basis with USD to PKR exchange rate, Pakistan CPI and US CPI. The petitioner submitted that O&M of the power plant will be managed by in-house team with related services outsourced to the EPC Contractor, i.e. REL.

33. SSPPL further submitted that bifacial panels on single axis structure tend to have a relatively higher O&M cost because of higher & complex structure and more cleaning effort because of backside cleaning. SSPPL submitted that O&M cost claimed by power plants with similar panels and mounting structure configuration is higher than its claim. It submitted that the requested O&M cost of USD 12,000/MWp is also significantly lower than larger size solar PV projects are asking for.

34. The petitioner during hearing submitted that an O&M Contract has been signed with REL for the provision of O&M services for the Project during EPC warranty period including supply of spares and proprietary parts of equipment required during the normal operations and major maintenance of the Project. In addition to O&M contract cost, SSPPL submitted that the O&M cost of the company including staff salaries, utilities, land lease, security and other related cost for operations of the Project have also been included in this claim. On inquiry, the petitioner informed that there is no separate agreement on O&M and the EPC Term Sheet includes the provision of this cost head also.

35. To evaluate this claim of SSPPL, the O&M cost being allowed in other parts of the world has been referred. Local market conditions, required skilled manpower, spare parts etc. have

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also been deliberated. The cost recently being allowed to other solar PV power projects has also been compared. In view thereof, and considering the smaller size of the project, the Authority has decided to approve the O&M cost of USD 0.103 million per year to SSPPL, i.e. USD 10,000 per MW per year.

36. In line with the recent tariffs approved for solar PV projects, the Authority has decided to allow whole of O&M cost in local currency to the petitioner. Additionally, the Authority has decided that it may consider making changes in the approved O&M cost during the tariff control period in line with the related legal framework to be approved by the Authority.

Whether the claimed insurance during operation is justified?

37. SSPPL in the tariff petition claimed insurance during operation at the rate of 1% of claimed EPC Cost. Subsequently, during the hearing, SSPPL claimed insurance during operation at the rate of 0.46% of claimed EPC Cost and requested to allow the same being reasonable. The petitioner proposed following insurance coverage stating the same are required to be maintained throughout the life of the project:

- All risk insurance
- Comprehensive machinery insurance
- Business interruption insurance
- Terrorism insurance
- Third party liability etc.

38. The Authority noted that in the recently approved solar PV tariff determinations, insurance during operation at the rate of 0.4% of the approved EPC cost has been allowed. Benchmarking Guidelines also state the provision of insurance during operation at the rate of 0.4% of EPC cost for solar PV projects. In view thereof, the Authority has decided to allow insurance during operation at the maximum limit of 0.4% of the approved EPC cost, including all taxes/charges and/or duties, to the petitioner, subject to adjustment on actual basis as per the mechanism given in the Order part of this determination.

Whether the claimed return on equity is justified?

39. In the tariff petition, the petitioner requested for Return on Equity ("ROE"), both during construction and operation, of 15%, with any taxes payable on revenues, income and

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dividends as pass-through. Subsequently, during hearing, SSPPL requested for ROE of 12% on invested equity net of withholding tax. During the proceedings, on inquiry, SSPPL vide email communication dated September 17, 2020 confirmed that all the equity to be invested in the Project shall be from local sources

40. The Authority has noted that in the most recent comparable tariff cases of renewable technologies, the ROE to the limit of 13% (USD based) has been allowed. Keeping in view its most recent approvals, the Authority has decided to compute the tariff of ASPL while allowing ROE of 12% as claimed by the petitioner. With respect to the request of allowing withholding tax on dividend as pass through, it is noted that the Authority has decided principally not to allow this tax and the same treatment has been maintained in the instant case also.

41. It is important to highlight here that the components of ROE and Return on Equity during Construction ("ROEDC") have been computed and approved while taking into account the monthly cash flows such that annual rate of equity return comes out as 12%. It is to be noted that the approved amount (ROE + ROEDC) shall be the maximum limit of the annual equity return to be earned by the project company. The amount of equity return of any year, if exceeds by the given limit, shall be shared between the power producer and consumers through claw back formula to be decided by the Authority under the relevant framework.

Whether the claimed financing/debt terms are justified?

42. SSPPL in the petition and during hearing submitted that the project shall be financed through SBP Scheme. In this regard the petitioner submitted a letter issued by Silk Bank Limited dated December 13, 2019, stating its interest to finance the Project for up to USD 7.5 million. Following information is provided by the petitioner regarding the debt arrangement:

Debt	75% (100% local)
Interest	SBP rate (3%) + spread of 3% payable semi-annually
Repayment period	10 years

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43. The petitioner during the hearing submitted that it will endeavour to apply for the concessional financing under SBP Scheme, however, and any change in financing shall be duly presented to the Authority at the time of true-up of the tariff at COD.

44. The Authority has noted that Benchmarking Guidelines provide that the debt to equity ratio for all renewable power projects will be 80:20 and in case of change in ratio, the return approved on equity shall be adjusted to maintain cost of capital at the same level as under 80:20 debt to equity capital structure. The debt to equity ratio of 80:20 has also been approved by the Authority in the recently approved wind and solar tariff determinations. Therefore, the Authority has decided to compute and approve tariff of SSPPL using debt to equity ratio of 80:20.

45. Benchmarking Guidelines also provide that in case of renewable energy projects eligible for securing debt under SBP Scheme, a flat rate of 6% shall be approved. The size of the Project is 10.275 MW which makes it eligible to avail whole of the required financing under SBP Scheme, hence, the Authority has decided to compute and approve tariff of SSPPL at 6% as given in the SBP Scheme. In case the petitioner is not able to secure financing under SBP Scheme then the tariff shall be adjusted on commercial local/foreign financing, or a mix of both, at the time of its COD on the terms as given in the Benchmarking Guidelines. However, the petitioner shall have to prove through documentary evidence issued by SBP/commercial bank that it exhausted the option of availing financing under SBP scheme before availing conventional local/foreign loan.

46. The petitioner has claimed debt servicing period of 10 years for SBP financing. The Authority has noted that in recently approved wind and solar tariff determinations, it has allowed debt repayment period of 10 years for financing under SBP Scheme and therefore decided to allow the same to the petitioner also.

Whether the claimed annual energy production and corresponding plant capacity factor are justified? And Whether the petitioner's proposed solar modules and inverter technology satisfies the international standards of quality and operation?

47. SSPPL in the tariff petition and during the hearing has submitted the following in this regard:

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Project Capacity	10.2 MWp
Annual Power Generation	18.7 GWh
Net Annual Capacity Factor	20.5%

48. The petitioner submitted that it has selected bifacial monocrystalline PV modules (Tier-1 manufactured) as they provide the maximum efficiency and output. The petitioner submitted that as a result of change in technology (bi-facial panel with single axis structure), capacity factor of plant will be 20.5%. It stated that the major reason for relatively lower capacity factor is lower irradiation at it site as opposed to Sukkur and Gwadar. During the hearing, the petitioner apprised that the proposed solar technology satisfies all the international standards of quality and operation. The petitioner had not submitted energy yield assessment report of the Project along with the tariff petition and vide email dated December 7, 2019 submitted certain technical information.

49. It has been noted that the Generation License for the proposed technology has already been approved for SSPPL which actually addressed the issue with respect to the technology. For plant capacity factor, the Authority has considered the modules, inverters and other equipment as proposed by SSPPL with respect to their quality and energy yield. The energy simulation parameters as submitted by the petitioner has also been examined. The plant capacity factor that has been allowed for bifacial mono crystalline modules in the recent tariff cases of different regions of the country were also checked. Considering these factors, the Authority is of the view that the claimed net plant capacity factor is on lower side i.e. 20.5%, therefore, decided to compute and approve the tariff of SSPPL on capacity factor of 21.9%. The solar resource risk shall be borne by the power producer and a sharing mechanism given in the Order part of this determination shall be applied on the annual energy produced beyond the approved annual capacity factor.

Whether the claimed construction period is justified?

50. SSPPL in the tariff petition had claimed construction period of 06 months. Subsequently, during hearing, 12 months construction period was requested by the petitioner. The Authority noted that it has approved construction period of 10 months (from the date of financial close) in the recently approved tariff cases of solar power projects (50-62 MW). For a 10 MW solar project, approved recently, the Authority allowed construction period of 8

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months. Keeping in view these decisions, the Authority has decided to approve construction period of 8 months for SSPPL.

Whether the project grid interconnection study is approved by the relevant organization(s)?

51. The petitioner has submitted that the plant will be connected to nearest Multan Electric Supply Company (MEPCO) grid in Dahranwala, Bahawalnagar via 11KV line. In this regard, the petitioner submitted a copy of approval of Grid Interconnection Study (GIS) of the Project issued by MEPCO dated December 9, 2015 whereby MEPCO conveyed the approval of GIS for the 10 MW SSPL's solar PV project. The Authority has noted that during the proceedings of the Generation License as approved for SSPPL on November 17, 2020, the matter of interconnection of the Project has already been discussed and addressed. In view thereof, the Authority considers this issue settled.

Degradation Factor

52. SSPPL has claimed capitalized degradation of USD 0.272 million under project cost. The Authority has noted that degradation factor of modules at 0.5% per year has been taken into account in the recently approved tariff cases of solar PV power projects and decided to approve the same in SSPPL's tariff. The Authority has decided to capitalize the impact of allowed degradation in the approved project cost. The amount of USD 0.212 million has been made part of the approved project cost while calculating the same at the levelized rate of 3.62% of the approved EPC cost.

53. **ORDER**

In pursuance of section 7(3)(a) of the Regulation of Generation, Transmission and Distribution of Electric Power Act, 1997 and NEPRA (Tariff Standards & Procedure) Rules, 1998, the Authority hereby determines and approves the generation tariff along with terms and conditions for Safe Solar Power (Pvt.) Limited (SSPPL) for its 10.275 MWp solar PV power project for delivery of electricity to the power purchaser as follows:

- Levelized tariff works out to be Rs. 6.4255/kWh (US Cents 3.8615/kWh).
- The tariff has been worked out on Build, Own and Operate basis.
- EPC cost of USD 5.857 million has been approved.

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- Project Development Cost of USD 0.240 million has been approved.
- Cost of Land of USD 0.108 million has been approved
- Insurance during constriction at the rate of 0.4% of the allowed EPC cost has been approved.
- Financing fee & charges at the rate of 2% of the debt portion of the capital cost has been approved.
- Debt to Equity ratio of 80:20 has been approved.
- Tariff has been computed using 100% local financing under SBP Scheme.
- The cost of debt of 6% (SBP Scheme) has been used.
- Debt Repayment has been scheduled for 10 years from COD.
- ROE of 12% has been allowed.
- O&M Cost of USD 10,000 per MW per year has been allowed.
- Insurance during Operation has been calculated as 0.40% of the allowed EPC Cost.
- Construction period of 8 months has been allowed.
- Net Annual Plant Capacity Factor of 21.9% has been approved.
- Degradation factor of 0.5% per year has been approved. The financial impact of the allowed degradation of USD 0.212 million has been taken into account in the approved project cost.
- Reference Exchange Rates of 166.40 PKR/USD has been used.
- IDC and ROEDC have been worked out using following drawdown schedule:

Month 1	5.00%
Month 2	5.00%
Month 3	5.00%
Month 4	15.00%
Month 5	15.00%
Month 6	15.00%
Month 7	20.00%
Month 8	20.00%

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- Detailed component wise tariff is attached as **Annex-I** of this determination.
- Debt Servicing Schedule is attached as **Annex-II** of this determination.

A. One Time Adjustments at COD

- The EPC cost shall be verified and 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 during the construction period, on production of authentic documentary evidence by the petitioner to the satisfaction of the Authority. The adjustment in applicable portion of the approved EPC cost shall be made for the currency fluctuation against the reference parity values.
- PDC, Land cost, 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 166.40 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.
- 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.
- 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 08 months starting from the date of financial close.
- For full/part of commercial foreign or local loan or a mix of both, if applicable and availed by the company, the IDC shall also be allowed adjustment for change in applicable LIBOR/KIBOR.

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- The reference tariff has been worked out on the basis of cost of 6% stated 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 commercial 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) during the project construction period of 08 months from the date of financial close.

B. Indexations during operations

Insurance shall be allowed adjustment on yearly basis starting from either 1st July or 1st January. ROE, ROEDC and O&M Components shall be adjusted on quarterly basis to be applicable from 1st July, 1st October, 1st January and 1st April. Adjustment of Debt Servicing Component (if any) shall be made either quarterly/bi-annually/annual, depending upon the final terms approved by the Authority at the time of COD. The indexation mechanisms are given hereunder:

i) Operation and Maintenance Costs

O&M component of tariff shall be adjusted on account of change in local Inflation (N-CPI) as notified by the Pakistan Bureau of Statistics according to the following mechanism:

L. O&M (REV)	=	L. O&M (REF) * CPI (REV) / CPI (REF)
Where;		
L. O&M (REV)	=	The revised O&M Local Component of Tariff
L. O&M (REF)	=	The reference O&M Local Component of Tariff
CPI (REV)	=	The revised N-CPI (General)

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N-CPI (REF)	=	The reference N-CPI (General) of 141.83 for the month of November, 2020

Note: *The reference index of N-CPI shall be revised for making the required adjustments in O&M component at the time of COD. For the adjustment of O&M component at COD, the revised N-CPI value for the middle month of preceding quarter prior to the date of COD shall be considered. Thereafter, the N-CPI value taken at COD shall become reference for subsequent adjustments in the O&M component.*

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. 166.40/USD
P (Act)	=	Actual premium or 0.4% of the approved EPC Cost converted into Pak Rupees on exchange rate prevailing on 1st day of the insurance coverage period, whichever is lower

iii) **Return on Equity**

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

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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 on the last day of the preceding quarter as notified by the National Bank of Pakistan
ER (Ref)	=	The reference TT & OD selling rate of Rs. 166.40/USD

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

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, duly appointed by the power purchaser, at the time of the commissioning of the plant.
- This tariff will be limited to the extent of net annual energy generation supplied to the power purchaser up to 21.9% net annual plant capacity factor. Net annual energy generation supplied to the power purchaser in a year, in excess of 21.9%, will be charged at the following tariffs:

Net annual plant capacity factor	% of prevalent tariff allowed to power producer
Above 21.9% to 22.0%	-
Above 22.0% to 22.75%	10%
Above 22.75% to 23.25%	20%
Above 23.25% to 24%	30%
Above 24%	40%

- The risk of solar resource shall be borne by the power producer.
- The maximum plant capacity shall not exceed as given in the Generation License.

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- In the 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 petitioner is directed to ensure that all the equipment is installed as per the details/specifications given in the latest generation license/tariff as awarded by NEPRA.
- The petitioner is hereby directed to secure the maximum available loan under the SBP Scheme. The savings in the cost of financing under SBP Scheme shall be shared between power purchaser and power producer in the ratio of 60:40 at the time of COD or during any time of the loan tenor, as applicable.
- In case the company shall secure full or part of local commercial loan then the tariff of company shall be computed/adjusted at the time of COD at applicable KIBOR + spread of 2.25%. The savings in the approved spreads anytime 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 computed/adjusted at the time of COD at applicable LIBOR + spread of 4.25%. The savings in the approved spreads any time 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 approved yearly outstanding principal and interest amounts. For financing with Sinosure, the spread/margin over LIBOR shall be adjusted to the extent such that the total financing cost (applicable LIBOR + Adjusted Margin + Sinosure) shall not exceed the financing cost without Sinosure (applicable LIBOR + Approved Margin).
- The Authority may consider making changes in the O&M cost while capping the allowed prevailing level, which shall be governed under legal framework to be approved by the Authority in this regard.
- In case the company earns annual profit in excess of the approved return on equity (including ROEDC), then that extra amount shall be shared between the power producer

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and consumers through claw back formula to be decided by the Authority through the relevant framework. For that purpose, the share of producer as given in the bonus energy mechanism shall be taken into account.

- Allowed limit of degradation has been made part of the approved project cost. No extra financial compensation shall be provided in the EPA.
- The company will have to achieve financial close within one year from the date of issuance of tariff determination. The tariff granted to the company will no longer remain applicable/valid, if financial close is not achieved by the company, for whatever reason, in the abovementioned timeline or its generation license is declined/revoked by NEPRA.
- The targeted maximum construction period from prescribed date/time of financial close is 8 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 8 months will not invalidate the tariff granted to it.
- Pre COD sale of electricity is allowed to the power producer, subject to the terms and conditions of EPA, at the reference tariff excluding debt servicing and return components. However, pre COD sale will not alter the required COD stipulated in the EPA 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 allowed as pass through.
- 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.

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54. The Order part along with 2 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

(Rafique Ahmed Shaikh)
Member

(Eng. Bahadur Shah)
Member

(Rehmatullah Baloch)
Member

(Saif Ullah Chattha)
Vice Chairman
20.1.2021

(Tauseef H. Farooqi)
Chairman

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Annex-I

Safe Solar Power (Pvt.) Ltd.
Reference Tariff Table

Year	O&M Local	Insurance	Return on Equity	ROEDC	Loan Repayment	Interest Charges	Tariff
	Rs. / kWh	Rs. / kWh	Rs. / kWh	Rs. / kWh	Rs. / kWh	Rs. / kWh	Rs. / kWh
1	0.8674	0.1978	1.2723	0.0446	3.3677	2.6056	8.3553
2	0.8674	0.1978	1.2723	0.0446	3.5743	2.3989	8.3553
3	0.8674	0.1978	1.2723	0.0446	3.7936	2.1796	8.3553
4	0.8674	0.1978	1.2723	0.0446	4.0264	1.9468	8.3553
5	0.8674	0.1978	1.2723	0.0446	4.2735	1.6997	8.3553
6	0.8674	0.1978	1.2723	0.0446	4.5358	1.4375	8.3553
7	0.8674	0.1978	1.2723	0.0446	4.8141	1.1592	8.3553
8	0.8674	0.1978	1.2723	0.0446	5.1095	0.8638	8.3553
9	0.8674	0.1978	1.2723	0.0446	5.4230	0.5502	8.3553
10	0.8674	0.1978	1.2723	0.0446	5.7558	0.2174	8.3553
11	0.8674	0.1978	1.2723	0.0446	-	-	2.3820
12	0.8674	0.1978	1.2723	0.0446	-	-	2.3820
13	0.8674	0.1978	1.2723	0.0446	-	-	2.3820
14	0.8674	0.1978	1.2723	0.0446	-	-	2.3820
15	0.8674	0.1978	1.2723	0.0446	-	-	2.3820
16	0.8674	0.1978	1.2723	0.0446	-	-	2.3820
17	0.8674	0.1978	1.2723	0.0446	-	-	2.3820
18	0.8674	0.1978	1.2723	0.0446	-	-	2.3820
19	0.8674	0.1978	1.2723	0.0446	-	-	2.3820
20	0.8674	0.1978	1.2723	0.0446	-	-	2.3820
21	0.8674	0.1978	1.2723	0.0446	-	-	2.3820
22	0.8674	0.1978	1.2723	0.0446	-	-	2.3820
23	0.8674	0.1978	1.2723	0.0446	-	-	2.3820
24	0.8674	0.1978	1.2723	0.0446	-	-	2.3820
25	0.8674	0.1978	1.2723	0.0446	-	-	2.3820
Levelized Tariff	**0.8674**	**0.1978**	**1.2723**	**0.0446**	**2.8867**	**1.1568**	**6.4255**

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Annex-II

Safe Solar Power (Pvt.) Ltd.
Debt Servicing Schedule

Relevant Quarters	Base amount (Rs.)	Principal Repayment (Rs.)	Interest (Rs.)	Balance Principal (Rs.)	Total Debt Service (Rs.)	Annual Principal Repayment (Rs./kWh)	Annual Interest (Rs./kWh)
1	880,607,815	16,227,050	13,209,117	864,380,765	29,436,167	3.3677	2.6056
2	864,380,765	16,470,456	12,965,711	847,910,309	29,436,167		
3	847,910,309	16,717,512	12,718,655	831,192,797	29,436,167		
4	831,192,797	16,968,275	12,467,892	814,224,522	29,436,167		
5	814,224,522	17,222,799	12,213,368	797,001,723	29,436,167	3.5743	2.3989
6	797,001,723	17,481,141	11,955,026	779,520,582	29,436,167		
7	779,520,582	17,743,358	11,692,809	761,777,224	29,436,167		
8	761,777,224	18,009,509	11,426,658	743,767,715	29,436,167		
9	743,767,715	18,279,651	11,156,516	725,488,064	29,436,167	3.7936	2.1796
10	725,488,064	18,553,846	10,882,321	706,934,218	29,436,167		
11	706,934,218	18,832,154	10,604,013	688,102,064	29,436,167		
12	688,102,064	19,114,636	10,321,531	668,987,428	29,436,167		
13	668,987,428	19,401,356	10,034,811	649,586,072	29,436,167	4.0264	1.9468
14	649,586,072	19,692,376	9,743,791	629,893,697	29,436,167		
15	629,893,697	19,987,762	9,448,405	609,905,935	29,436,167		
16	609,905,935	20,287,578	9,148,589	589,618,357	29,436,167		
17	589,618,357	20,591,892	8,844,275	569,026,465	29,436,167	4.2735	1.6997
18	569,026,465	20,900,770	8,535,397	548,125,695	29,436,167		
19	548,125,695	21,214,282	8,221,885	526,911,414	29,436,167		
20	526,911,414	21,532,496	7,903,671	505,378,918	29,436,167		
21	505,378,918	21,855,483	7,580,684	483,523,435	29,436,167	4.5358	1.4375
22	483,523,435	22,183,315	7,252,852	461,340,119	29,436,167		
23	461,340,119	22,516,065	6,920,102	438,824,054	29,436,167		
24	438,824,054	22,853,806	6,582,361	415,970,248	29,436,167		
25	415,970,248	23,196,613	6,239,554	392,773,635	29,436,167	4.8141	1.1592
26	392,773,635	23,544,562	5,891,605	369,229,072	29,436,167		
27	369,229,072	23,897,731	5,538,436	345,331,341	29,436,167		
28	345,331,341	24,256,197	5,179,970	321,075,145	29,436,167		
29	321,075,145	24,620,040	4,816,127	296,455,105	29,436,167	5.1095	0.8638
30	296,455,105	24,989,340	4,446,827	271,465,764	29,436,167		
31	271,465,764	25,364,181	4,071,986	246,101,584	29,436,167		
32	246,101,584	25,744,643	3,691,524	220,356,941	29,436,167		
33	220,356,941	26,130,813	3,305,354	194,226,128	29,436,167	5.4230	0.5502
34	194,226,128	26,522,775	2,913,392	167,703,353	29,436,167		
35	167,703,353	26,920,617	2,515,550	140,782,736	29,436,167		
36	140,782,736	27,324,426	2,111,741	113,458,310	29,436,167		
37	113,458,310	27,734,292	1,701,875	85,724,018	29,436,167	5.7558	0.2174
38	85,724,018	28,150,307	1,285,860	57,573,711	29,436,167		
39	57,573,711	28,572,561	863,606	29,001,150	29,436,167		
40	29,001,150	29,001,150	435,017	(0)	29,436,167		

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