



REGISTRAR

# National Electric Power Regulatory Authority Islamic Republic of Pakistan

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No. NEPRA/TRF-558/11754

July 5, 2022

The Manager  
Printing Corporation of Pakistan Press (PCPP)  
Khayaban-e-Suharwardi,  
Islamabad

Subject: **NOTIFICATION REGARDING DETERMINATION OF THE AUTHORITY  
IN THE MATTER OF PETITION FOR TARIFF MODIFICATION FILED BY  
PAKHTUNKHWA ENERGY DEVELOPMENT ORGANIZATION (PEDO)  
FOR 36.6 MW DARAL KHAWAR HYDROPOWER PROJECT LOCATED  
AT DISTRICT SAWAT OF KHYBER PAKHTUNKWA**

In pursuance of Sub-Section 7 of Section 31 of the Regulation of Generation, Transmission and Distribution of Electric Power Act, 1997 (XL of 1997); enclosed please find herewith '*Determination of the Authority in the matter of Petition for Tariff Modification filed by Pakhtunkhwa Energy Development Organization (PEDO) for 36.6 MW Daral Khawar Hydropower Project located at District Sawat of Khyber Pakhtunkwa Province in Case No. NEPRA/TRF-558/DKHP-2021*' for immediate publication in the official Gazette of Pakistan. Please also furnish thirty five (35) copies of the Notification to this Office after its publication.

Encl: Notification (18 Pages) & CD

(Syed Safeer Hussain)

CC:

1. **Syed Mateen Ahmed**, Deputy Sectary (T&S), Ministry of Energy – Power Division, 'A' Block, Pak Secretariat, Islamabad
2. Chief Executive Officer, Central Power Purchasing Agency (Guarantee) Limited, 73 East, AKM Fazl-ul-Haq Road, Block H, G 7/2 Blue Area, Islamabad

**National Electric Power Regulatory Authority**

**NOTIFICATION**

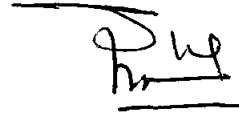


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Islamabad, the 5<sup>th</sup> day of July, 2022

**S.R.O.** ~~997~~ (I)/2022.- In pursuance of Sub-Section 7 of Section 31 of the Regulation of Generation, Transmission and Distribution of Electric Power Act, 1997 (XL of 1997), NEPRA hereby notifies the Determination of the Authority in the matter of Petition for Tariff Modification filed by Pakhtunkhwa Energy Development Organization (PEDO) for 36.6 MW Daral Khawar Hydropower Project located at District Sawat of Khyber Pakhtunkhwa Province in Case No. NEPRA/TRF-558/DKHP-2021.

2. While effecting the Determination, the concerned entities including Central Power Purchasing Agency Guarantee Limited (CPPAGL) shall keep in view and strictly comply with the orders of the courts notwithstanding this Decision.

  
05 07 22  
(Syed Safeer Hussain)  
Registrar



**DETERMINATION IN THE MATTER OF PETITION FOR TARIFF MODIFICATION  
FILED BY PAKHTUNKHWA ENERGY DEVELOPMENT ORGANIZATION (PEDO) FOR  
36.6 MW DARAL KHWAR HYDROPOWER PROJECT LOCATED AT DISTRICT SWAT OF  
KHYBER PAKHTUNKHWA PROVINCE**

**BACKGROUND**

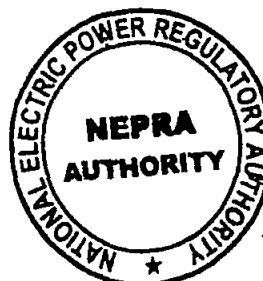
1. Daral Khwar Hydropower Project (hereinafter referred to as the "Project") is a run-of-the river hydropower project of the Pakhtunkhwa Energy Development Organization (hereinafter referred to as "PEDO" or the "Petitioner") located at the right tributary of river Swat in District Swat of Malakand Division, KPK.
2. The Authority has issued generation license to the Project on May 19, 2017, and approved EPC stage generation tariff of Rs. 8.4377/kWh or US Cents 8.0594/kWh, on January 9, 2018 (hereinafter referred to as the "Tariff Determination"). The said tariff was an energy based, single-part tariff with hydrological risk, to the extent of 154 GWh, to be borne by the power purchaser.

**FILING OF TARIFF MODIFICATION PETITION**

3. The Petitioner, vide letter dated March 31, 2021, filed tariff modification petition (hereinafter referred to as the "Modification Petition") under Section 31 of NEPRA Act, 1997 read with Rule 3 of the NEPRA (Tariff Standards and Procedure) Rules, 1998 for modification of Authority's determination dated January 9, 2018. The Petitioner requested for provision of Pre-COD sale tariff, conversion of its existing Take or Pay tariff to Take and Pay tariff and extension of debt repayment period from the existing 20 years to 30 years.
4. The tariff modification petition was admitted by the Authority on May 4, 2021 for further processing.

**HEARING**

5. In order to proceed further, the Authority decided to conduct an online hearing in the matter. Accordingly, the notice of admission/hearing, along with list of issues, were published in newspapers on June 20, 2021, and individual notices were sent to stakeholders on June 23, 2021. The list of issues framed for this hearing were as follows:
  - I Whether to allow Pre-COD sale of electricity at the tariff applicable for the first year of operations minus debt servicing component of tariff?
  - II Whether to allow tariff on Take and Pay basis?
  - III Whether to allow debt repayment period of 30 years?
6. In response to hearing notices, comments from the Punjab Power Development Board (PPDB) vide letter dated July 07, 2021, and Central Power Purchasing Agency (hereinafter referred to as "CPPA-



G") vide letter dated July 02, 2021, were received. The comments of above parties will be discussed under the relevant sections. No intervention requests were received.

7. Hearing in the matter was held as per schedule on Tuesday, July 6, 2021, at 10:00 AM via Zoom which was participated by, among others, the Petitioner and its consultant. The Petitioner, with the support of its consultant, presented its case for modification in tariff. In response to the issues framed, the Petitioner vide letter dated July 12, 2021, also submitted written comments.
8. During the deliberations of the aforementioned issues, additional issues regarding the case came up which were not made part of the proceedings previously. Therefore, in order to seek comments of stakeholders, including the Petitioner, the Authority decided to conduct a hearing on those additional issues. The list of these additional issues is as follows:
  - I Whether to reduce ROE & ROEDC from 17% with USD indexation to 10% without USD indexation, similar to the Federal Government recently allowed projects including WAPDA/GENCOs etc.?
  - II Whether to reduce the cost of local debt from 10.25% to 7.3%, in line with recently approved PEDO projects?
  - III Whether to include provision for claw back of excess return or otherwise?
9. Accordingly, another hearing in the matter was fixed for Wednesday, October 20, 2021, for which hearing notice, along-with the list of additional issues, were published in newspapers on October 14, 2021, and individual notices were sent to stakeholders on October 14, 2021. Hearing was held as per schedule wherein the Petitioner, with the assistance of its consultant, presented the case while representatives from CPPA-G were also present and their comments are addressed under the relevant issues.
10. **Whether to allow Pre-COD sale of electricity at the tariff applicable for the first year of operations minus debt servicing component of tariff?**
11. According to the Petitioner, the Project has been operational since February 2019 and has been providing electricity to Peshawar Electric Supply Company (hereinafter referred to as "PESCO"), however, the Project's COD could not be declared due to non-installation of back-up meter, dedicated Current Transformers and Potential Transformers (CT & PT) at site. According to the Petitioner, the back-up meter and dedicated CT & PT were not installed because the Chinese engineers could not travel to the site due to COVID-19.
12. The Petitioner has provided the details of the number of units exported since February, 2019. The Petitioner further submitted that since the COD has not been declared, further electricity is being injected to the grid in addition to the details provided along with the modification petition.
13. According to the Petitioner, there is no provision of pre-COD sale of electricity in the Authority's tariff determination dated January 9, 2018, therefore, the Project cannot realize any revenue in respect of pre-COD supply of electricity to the grid.
14. In this regard, the Petitioner has provided precedents where the Authority had allowed pre-COD sale of electricity to other projects. That is, the applicable tariff excluding principal repayment of debt component and interest component was allowed in the cases of upfront tariffs of small hydro, wind

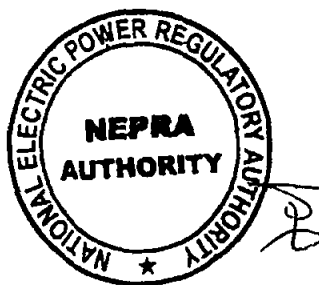


and bagasse power projects. Similarly, the Petitioner submitted that in the case of Pak-Pattan Hydropower Project, the Authority allowed pre-COD sale at applicable tariff minus the repayment of debt and interest component.

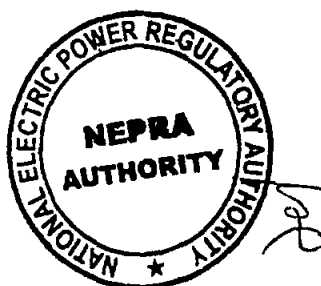
15. Given the above, the Petitioner requested the Authority to allow compensation from the power purchaser for all electricity supplied into the grid system prior to achievement of COD at the tariff rate applicable for the first year of operations minus the debt servicing component of tariff.
16. Subsequent to the first hearing, the Petitioner, vide letter dated July 12, 2021, further submitted that the backup meter through dedicated CTs & PTs have now been installed successfully at site with testing/inspection/sealing by NTDC, undertaken on May 25, 2021 while the Independent Engineer has also issued successful completion of all COD tests on July 15, 2020. Further according to the Petitioner, CPPA-G has agreed for declaration of COD w.e.f May 26, 2021, condition to some Site Acceptance Tests, which have been successfully performed between July 5 – 10, 2021.
17. CPPA-G, vide its comments dated July 02, 2021, submitted that as per previously signed hydro EPAs/PPAs, only the Variable O&M component (local & foreign) and Water Use Charge (if applicable) is compensated by the CPPA-G for the Pre-COD sale of energy, which is due to the reason that the Fixed Component/ Capacity payment are to be dealt after the COD. The CPPA-G, in this regard, reproduced the appropriate sections of the EPA and PPA of Riali-II and Patrind HPPs, respectively, wherein Water Use Charge and the local and foreign O&M components in the case of Riali-II and Variable O&M component and Water Use Charge in the case of Patrind were to be paid by the purchaser for the period post synchronization prior to COD. According to the CPPA-G, a similar clause is also mentioned in the PPA of 720 MW Karot HPP signed on August 30, 2016. Given the above, CPPA-G requested only Variable O&M component may be allowed for the Pre-COD sale in the instant case for only units verified by Convener Metering Committee for the Pre-COD payments.
18. The Authority noted that sale of power before COD occurs when the plant is synchronized with the grid and the power is generated as a result of conducting certain tests such as initial capacity test, reliability run test, turbine governor operation; minimum load capability etc. These tests are generally called commissioning tests which are agreed well before COD through EPAs. In the instant case, it was noted that as per the information provided, the COD of the Project was delayed. However, as stated by the Petitioner, the Project has been providing electricity since February 2019, therefore, the Authority has decided to allow a tariff of variable O&M, which is also consistent with the Standard PPA of hydropower projects, as Pre-COD tariff in the instant case and the same shall be incorporated in the eventual EPA with concerned Buyer. The Authority has also shown its displeasure towards CPPA-G/PEDO regarding delay in achieving COD of the Project as the power was being sold since February 2019. This matter shall be taken up separately by the Authority and an explanation shall be sought from CPPA-G and PEDO regarding delay in commissioning of the project for the last 3 years.

**Whether to allow tariff on Take and Pay Basis?**

19. According to the Petitioner, the Authority determined tariff for the Project on "Take or Pay" basis whereby the hydrological risk was to be borne by the Power Purchaser, however, PEDO in its EPA with the CPPA-G has agreed a tariff on "Take and Pay" basis because PEDO intends to incorporate an exit clause in the EPA so that it can enter into wheeling arrangement subsequently by exercising the exit clause.



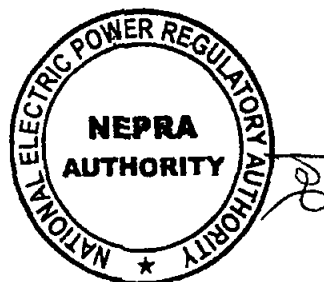
20. According to PEDO, it signed an EPA with CPPA-G on May 14, 2019, and the same was submitted by CPPA-G to the Authority for approval. According to the Petitioner, NEPRA vide letter dated August 7, 2020, responded to CPPA-G that the tariff granted to the Project is on take or pay basis instead of take and pay and that in case PEDO and CPPA-G require any amendment in the tariff, the same can be done through a tariff modification petition. In the subject modification petition, PEDO has highlighted the benefits of a take and pay based tariff by stating that it will reduce the overall burden of capacity payment on CPPA-G and the end-consumers. The Petitioner also submitted that in the case of other similar hydropower projects, the Authority had allowed tariff on Take and Pay basis, whereby the hydrological risk is to be borne by the Power Producer. Given the above, the Petitioner has requested the Authority to modify the tariff to "take and pay" basis.
21. Subsequent to the hearing, the Petitioner, vide letter dated July 12, 2021, submitted that the take and pay arrangement for the Project is pursuant to GoKP's intent to sell electricity from the Project to BPCs in KP through a wheeling arrangement in the future. The Petitioner submitted that the KP Cabinet has approved the Project as part of Wheeling Phase – II portfolio. According to the Petitioner, an EPA on a take and pay arrangement will allow incorporation of an entry/exit clause for PEDO to enable it to enter into wheeling arrangements in future.
22. In this regard, the CPPA-G, vide letter dated July 02, 2021, submitted that EPA of the Project has been signed on take and pay basis because PEDO requested to incorporate an entry/exit clause, so that it can enter into a wheeling agreement at a later stage by exercising the exit clause. Therefore, according to CPPA-G, take and pay regime was opted instead of take or pay in the EPA in order to avoid potential additional capacity charges arising due to possible provocation of exit clause by PEDO. According to the CPPA-G, hydrological risk must be borne by the power producer, therefore, it is of the view that tariff of subject hydropower project may be modified by Authority from take or pay basis to take and pay basis.
23. The Authority noted that it approved a single-part tariff for the Project based on net annual plant factor of 154 GWh and that for this Project, the hydrological risk was to be taken by power purchaser.
24. In the most recent decisions for hydro power projects, particularly Karora HPP, Jabori HPP, Lawi HPP and Koto HPP, NEPRA has determined tariffs on take and pay basis wherein the hydrological risk was to be borne by the power producer with bonus energy, produced beyond their respective plant factors to be charged at 10%.
25. The Authority observed that the tariff in the instant case will not change as the benchmark energy on which the tariff is calculated will remain the same. However, the power purchaser and the end-consumers will benefit from the proposed arrangement as it will reduce the additional burden of capacity payments to be made in case of shortfall of water resource.
26. Since the Petitioner itself has requested to change its tariff regime from the existing Take or Pay basis to Take and Pay basis, therefore, the same is being allowed meaning thereby that hydrological risk shall now be borne by the power producer and any excess generation beyond the determined annual benchmark energy shall be charged at 10% of the prevailing tariff. In case the PEDO wants to exit and sell the energy from Daral Khwar HPP to the buyer(s) other than the national grid/CPPA-G/DISCOs, then the terms of such arrangement shall be mutually agreed between parties to the EPA and, reflected in the draft EPA and submitted for the approval of the Authority.



**Whether to allow debt repayment period of 30 years?**

**Whether to reduce the cost of local debt from 10.25% to 7.3%, in line with recently approved PEDO projects?**

27. According to the Petitioner, the Authority allowed tariff to the Project based on a 20-year debt repayment period, whereby higher tariff is allowed in the initial 20 years and a lower tariff in the last 10 years. The Petitioner has requested the Authority to allow a debt term of 30 years which according to the Petitioner shall result in increasing the levelized tariff from US Cents 8.0594/kWh to US Cents 8.0913/kWh (or Rs. 8.4377/kWh to Rs. 8.4711/kWh).
28. The Petitioner vide letter dated July 12, 2021, further submitted that the Project has signed an EPA allowing an exit clause from the agreement in future and sell its electricity to BPCs in KP Province through wheeling arrangement. According to Petitioner, in the event PEDO exercises its exit option available in the EPA prior to completion of the agreement term, the Power Purchaser shall not be able to avail the accrued benefit of lower post-debt period tariff. The Petitioner submitted that in order to neutralize this impact on Power Purchaser/ consumer, PEDO proposes to allow the Project on debt repayment period of 30 years (i.e., equal to the EPA term). According to the Petitioner, if the debt repayment term is increased to 30 years, the higher tariff for first 20 years will reduce from US Cents 8.9522/kWh to US Cents 8.0913/kWh while there will be no adverse financial implication for CPPA-G in the event of exit from EPA. The Petitioner further submitted that it will also increase the levelized tariff by US Cents 0.032/kWh to US Cents 8.0913/kWh. According to the Petitioner, this minor increase in levelized tariff is due to the assumed cost of debt in the tariff determination (10.25%) being higher than the discount rate of 10% used in computing the levelized tariff. The Petitioner, in its written comments, also submitted that the Authority may at its discretion revise the cost of debt downwards to 10.15% in order to equalize the proposed modified levelized tariff with the levelized tariff in the original tariff determination. Finally, the Petitioner submitted that the Authority in the cases of Koto, Karora and Jabori HPPs has allowed tariff on 30-year debt period, therefore, the same has been requested by the Petitioner in the instant case.
29. In this regard, the CPPA-G vide letter dated July 7, 2021, submitted that since PEDO is financing the Project from its own resources (HDF) and using an opportunity cost of funds. It is therefore, suggested that instead of 10.25% fixed rate, the interest rate may be rationalized to 6 month KIBOR without any spread in line with other PEDO HDF funded projects such as Koto HPP in order to pass on the relief to electricity consumers by extending the term from 20 to 30 years.
30. The PPDB vide letter dated July 7, 2021, submitted that the Authority has given tariff of PKR 8.4377/kWh (or US Cents 8.0594/kWh). The current requested tariff numbers of US Cents 8.0913/kWh (or Rs. 8.4711/kWh) need to be rationalized with respect to current scenario of the country, keeping in consideration of its effect on consumers.
31. During the second hearing, with regards to the issue of reduction of cost of local debt from 10.25% to 7.3%, in line with other PEDO projects, the Petitioner submitted that it has not accepted Authority's decisions with regards to 7.3% cost of local debt in other PEDO projects. Further, the Petitioner submitted that Authority had previously allowed KIBOR + 3%, however, in the instant case, the cost of debt was based on GoKP's letter and the Authority while determining tariff in the instant case ascertained that at that time, a 20-year debt repayment period was not common so, the requested cost of debt was compared with 20-year PIB rate which was more than 10.25% and WAPDA's relent loans which was at 17% at that time. Therefore, the Authority allowed a 10.25% fixed rate in the instant case. The Petitioner further submitted that as of now, the cost of relent loans



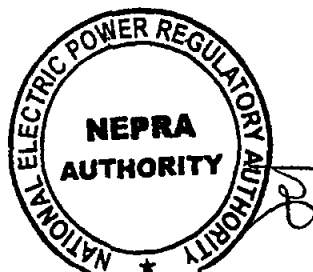
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approved by the Authority in the case of WAPDA is 12.52% and that the 15-year PIBs rate is 10.4% and as the maturity increases, the rate increases. According to the Petitioner, it is requesting an increase in the debt repayment period from the existing 20 years to 30 years, still as per the normal phenomena, an increase in the cost of debt has not been requested. Rather, the Petitioner submitted that the existing cost of debt of 10.25% may be approved for the extended debt repayment period of 30 years.

32. The CPPA-G vide its letter dated November 05, 2021, provided its written comments with regards to the issue of cost of local debt. According to the CPPA-G, the issue of cost of HDF funding may be seen from an opportunity cost point of view so an unutilized HDF is generally invested in risk-free assets. For this purpose, KIBOR may be considered an appropriate benchmark as approved in other HDF funded projects. CPPA-G further endorsed the Authority's decisions for HDF funded projects to allow the cost of debt at 6 month KIBOR that is 7.3% without any spread.
33. The Authority observed that in the instant case, it had approved the Project on the basis of 80:20 debt-equity ratio and that 99.4% (PKR 6,876.5 million) of the debt portion is financed by Hydel Development Fund with a fixed cost of 10.25% and 0.6% (USD 0.39 million) of the debt portion is financed by the Asian Development Bank's foreign debt costing LIBOR + 1.35% spread. Both loans have repayment periods of 20 years. Based on the above, the Authority approved the levelized tariff of US Cents 8.0594/kWh (or Rs. 8.4377/kWh), which was worked out on a discount rate of 10%.
34. The Authority noted that the cost of local debt in the instant case was such that an extension shall result in increase in the levelized tariff. Therefore, the extension in debt repayment is being allowed to the extent that such extension doesn't increase the already allowed levelized tariff. Based on the above, the cost of local debt works out to 10.18% and interest during construction (IDC) decrease from USD 9.769 million to USD 9.698 million.

**Whether ROE & ROEDC should be reduced to 10% with no USD indexation to keep in line with other public sector generation projects?**

35. No written comments have been received from the Petitioner on this issues, however, during the second hearing, the Petitioner linked this issue with the decision of CCOE dated August 27, 2020, and present three arguments.
36. According to the Petitioner, firstly, the main objective of the CCOE's decision was to reduce capacity charges. According to the Petitioner, when it has itself requested a tariff in the instant case based on Take and Pay regime, its Project falls outside of the purview the CCOE's aforementioned decision.
37. Secondly, according to the Petitioner, in the said CCOE's decision, QA Solar's return was reduced to 12% on Take and Pay basis, so reduction in QA Solar's return should be the starting point in the instant case. The Petitioner further submitted that the risks associated with a solar project are not consistent to the risks associated with a hydro project. According to the Petitioner, the construction period of a solar project is typically 8 to 10 months versus 3 to 4 years in the instant case and the hydrological risks associated with the Project are higher than the solar irradiance risks. Given the above, according to the Petitioner, neither WAPDA nor solar are comparable in terms of risks associated with the instant Project.
38. The Petitioner finally submitted that as a reference, the latest (September bidding) rate of 15-year PIB is 10.4% in PKR, however, the instant Project is exposed to a number of risks. According to the



Petitioner, the returns earned from the Project are planned to be invested in other similar projects and that the Petitioner will not receive any other allocation on this account, therefore, such drastic reduction in return will disturb our entire planning. The Petitioner also submitted that although the case is pending in the high court, if decided, the Project may be exposed to a 30% tax as it is a provincial government entity.

39. In this regard, the representative of CPPA-G, during the second hearing and vide its letter dated November 05, 2021, submitted that the equity invested by the Petitioner in the instant Project is PKR based, therefore, there should be no USD exchange rate indexation on the ROE component. CPPA-G further submitted that with regards to the requested 17% return, there is enough liquidity in the market and that this is a state owned entity, therefore, 10% return is sufficient because these are their own funds as mentioned in the Authority's determination for Karora and in line with the Authority's decisions regarding WAPDA hydro projects like Neelum Jehlum and PEDO projects.
40. The Authority has considered the submissions of the Petitioner and other stakeholders on the issue and noted that the Project was allowed tariff in January 2018 where USD based 17% IRR was allowed based on the then market conditions, therefore, its comparison with recent HPPs (such as Karora, Koto, Jabori and Lawi, where returns of 13% were allowed in November 2021 from the previous 10% return), may not be prudent. However, being a provincial government funded project (Rs based equity), no more USD indexation shall be allowed. Therefore, a 17% PKR based return assuming monthly cash flows with no USD indexation is thus being allowed to the project. Accordingly, combined ROE & ROEDC components decrease from Rs. 2.3954/kWh to Rs. 2.2268/kWh.

**Whether to include provision for claw back of excess return or otherwise?**

41. No written comments have been received from the Petitioner on this issues, however, during the second hearing, the Petitioner submitted that there is no clarity as to how the mechanism shall be applicable in the instant case. According to the Petitioner, it is understood that this concept stems from thermal projects where heat rate related issues resulted in profits for those projects, however, the instant case is a hydropower project that is requesting a Take and Pay tariff by assuming hydrological risk. The Petitioner further submitted that in the case of those thermal projects, the excess profits have been seen to be due to delayed payments in interest, fuel efficiency, heat rate testing and O&M, and that these cannot be related with hydropower projects.
42. The Petitioner further submitted that it needs to be ascertained whether an IRR or ROE has been allowed by the Authority, as both are fundamentally different and that in case the Authority has determined an IRR, the same cannot be reopened as it was determined for the entire tariff control period. Therefore, clarity on the claw back mechanism is required.
43. In this regard, the representative of CPPA-G, during the second hearing and vide its letter dated November 05, 2021, submitted that in case it is ascertained that the Project has earned excess return due to whatever reasons, it is the right of the consumer that the same should be clawed back and in this regard, technology has no role in determining whether a project may or may not be able to earn excess return. Further, CPPA-G submitted that the Authority, in the cases of Tapal and Gul Ahmed has determined the mechanism of claw back. According to the CPPA-G, an effective claw back mechanism may also be introduced for claw back of excess return for the subject project so that any excess profit/gains over and above the regulated returns (on which tariff would be based) can be passed on to the electricity consumers.



44. The Authority considered the submissions of the Petitioner and the comments of CPPA-G, and decided that the return allowed to the Project shall be considered maximum ceiling and that return earned beyond the stated limit, if any, shall be adjusted, for which a claw back mechanism shall be prescribed at the time of COD.
45. Based on the above, the following project cost is being approved:

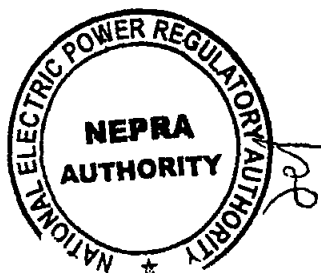
Cost Head	Allowed US\$ Million
EPC Contract/Construction Cost	69.696
Land Cost	1.550
Development Cost/PEDO I-lead Office Charge	0.220
Financing Fee & Commitment	0.012
Management Consultant	1.352
<b>Project Cost without IDC</b>	<b>72.830</b>
Interest During Construction	9.696
<b>Total Project Cost</b>	<b>82.526</b>

#### ORDER

46. Pursuant to Rule 6 of the National Electric Power Regulatory Authority Licensing (Generation) Rules, 2000, read with Section 31(7) of the Regulation of Generation, Transmission and Distribution of Electric Power Act, 1997, Pakhtunkhwa Energy Development Organization (the Petitioner) is allowed to charge, for its Daral Khwar Hydropower Project, the following specified/approved tariff for delivery of electricity to the Power Purchaser:

Tariff Components	Years 1-30 Rs./kWh	Indexation
Fixed O & M		
- Local	0.5346	CPI - General
- Foreign	0.1337	USD/PKR & US CPI
Insurance	0.3554	USD/PKR
Debt service (Local)	4.7849	-
Debt service (Foreign)	0.0121	USD/PKR & LIBOR
Return on equity	1.7732	NIL
Return on equity during construction	0.4516	NIL
Variable O & M - Local	0.1114	CPI - General
Variable O & M - Foreign	0.1114	USD/PKR & US CPI
<b>Total</b>	<b>8.2683</b>	

- i) The reference tariff has been calculated on the basis of net annual benchmark energy generation of 154.001 GWh for installed capacity of 36.6 MW.

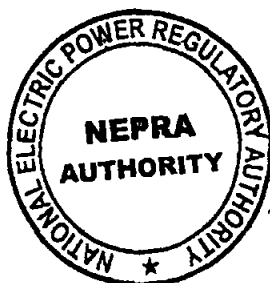


- ii) The above charges will be limited to the extent of net annual energy generation of 154.001 GWh. Net annual generation supplied during a year to the Power Purchaser in excess of benchmark energy of 154.001 GWh, will be charged at 10% of the prevalent approved tariff.
- iii) The tariff is based on Take & Pay basis, accordingly a single part tariff has been allowed to the Project.
- iv) In the above tariff no adjustment for carbon emission reduction receipts, has been accounted for. However, upon actual realization of carbon emission reduction receipts, the same shall be distributed between the Power Purchaser and the Petitioner in accordance with the approved mechanism given in the applicable government policy.
- v) The reference USD/PKR rate has been assumed as 104.6935.
- vi) The reference EUR/PKR rate has been assumed as 110.73.
- vii) The above tariff is applicable for a period of thirty years commencing from the commercial operations date (COD).
- viii) Annual ROE & ROEDC components at 17% (XIRR) assuming monthly payments has been approved. These components shall not be indexed with PRK to USD exchange rate.
- ix) The component wise tariff is indicated at Annex-I.
- x) Debt Servicing Schedule is attached as Annex-II.

#### I. One Time Adjustments

The following onetime adjustments shall be applicable to the reference tariff:

- a. The specific items of project cost to be paid in foreign currency (i.e. USD or EUR) will be adjusted at COD on account of actual variation in exchange rate over the reference USD/PKR exchange rate of Rs. 104.6935 and reference EUR/PKR exchange rate of 110.73 on production of verifiable documentary evidence by the Petitioner. For all project costs payable in PKR, the amounts allowed in US\$ will be converted into PKR using the reference USD/PKR exchange rate of Rs. 104.6935.
- b. Duties and/or taxes, not being of refundable nature, imposed on the Petitioner up to the commencement of its commercial operations will be subject to adjustment at actual on COD, upon production of verifiable documentary evidence to the satisfaction of the Authority.
- c. Adjustment of the interconnection cost to be borne by the Petitioner, if any, will be made at COD upon submission of a detailed plan duly endorsed by the Power Purchaser and authentic verifiable documents, to the satisfaction of the Authority.
- d. Land and Resettlement costs will be allowed as per actual, as against US\$ 1.550 Million allowed now, upon production of verifiable documentary evidence.



- e. Financial charges will be adjusted at COD on the basis of actual expense, up to a maximum ceiling of 3% of the total debt allowed (excluding the impact of interest during construction and financial charges), on production of authentic documentary evidence.
- f. The interest during construction will be adjusted at COD on the basis of actual debt draw downs (within the overall debt allowed by the Authority at COD), actual USD/PKR exchange rate variation for foreign loan and actual interest rates not exceeding the limit of 6 months LIBOR plus 0.60%, during the project construction period allowed by the Authority.
- g. The return on equity (including return on equity during construction) 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 allowed by the Authority.
- h. Any liquidated damages, penalties, etc. (by whatever name called), actually recoverable by the Petitioner from the EPC contractor(s), pertaining to the construction period allowed by the Authority, will be adjusted in the project cost at COD.
- i. The reference tariff table shall be revised at COD while taking into account the above adjustments. The Petitioner shall submit its request to the Authority within 90 days of COD for necessary adjustments in tariff.

## II. Hydrological Risk

Hydrological Risk shall be borne by the Power Producer.

## III. Indexations:

The following indexations shall be applicable to the reference tariff:

### i) Indexation applicable to O&M

The local part of O&M cost will be adjusted on account of local inflation and O&M foreign component will be adjusted on account of variation in dollar/rupee exchange rate and US CPI. Quarterly adjustments for inflation and exchange rate variation will be made on 1<sup>st</sup> July, 1<sup>st</sup> October, 1<sup>st</sup> January and 1<sup>st</sup> April respectively on the basis of latest available information with respect to CPI - General (notified by the Pakistan Bureau of Statistics), US CPI (notified by US Bureau of Labor Statistics) and revised TT & OD selling rate of US Dollar as notified by the National Bank of Pakistan. The mode of indexations will be as follows:

$$F O\&M_{(I,REV)} = F O\&M_{(I,REF)} * CPI_{(REV)} / CPI_{(REF)}$$

$$F O\&M_{(F,REV)} = F O\&M_{(F,REF)} * US CPI_{(REV)} / US CPI_{(REF)} * ER_{(REV)} / ER_{(REF)}$$

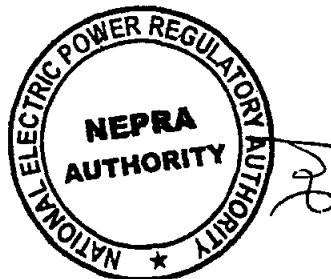
$$V O\&M_{(I,REV)} = V O\&M_{(I,REF)} * CPI_{(REV)} / CPI_{(REF)}$$



$$V O\&M_{(REV)} = V O\&M_{(REF)} * US CPI_{(REV)} / US CPI_{(REF)} * ER_{(REV)} / ER_{(REF)}$$

Where;

$F O\&M_{(REV)}$	= The revised applicable fixed O&M local component of tariff
$F O\&M_{(FREV)}$	= The revised applicable fixed O&M foreign component of tariff
$V O\&M_{(LREV)}$	= The revised applicable variable O&M local component of tariff
$V O\&M_{(FREV)}$	= The revised applicable variable O&M foreign component of tariff
$F O\&M_{(LREF)}$	= The reference fixed O&M local component of tariff for the relevant period
$F O\&M_{(FREF)}$	= The reference fixed O&M foreign component of tariff for the relevant period
$V O\&M_{(LREF)}$	= The reference variable O&M local component of tariff for the relevant period
$V O\&M_{(FREF)}$	= The reference variable O&M foreign component of tariff for the relevant period
$CPI_{(REV)}$	= The revised Consumer Price Index (General) as notified by the Pakistan Bureau of Statistics
$CPI_{(REF)}$	= 216.610 Consumer Price Index (General) of October 2017 notified by the Pakistan Bureau of Statistics
$US CPI_{(REV)}$	= The revised US CPI (all urban consumers)
$US CPI_{(REF)}$	= 245.519 US CPI (all urban consumers) for the month of October 2017 as notified by the US Bureau of Labor Statistics
$ER_{(REV)}$	= The revised TT & OD selling rate of US dollar as notified by the National Bank of Pakistan



ER<sub>(REF)</sub>

= The reference TT & OD selling rate of US dollar as notified by the National Bank of Pakistan - Current reference 104.6935

ii) Adjustment of insurance component

In case of insurance denominated in US \$, insurance cost component of tariff will be adjusted on account of USD/PKR exchange rate variation on actual basis. Further, insurance component of the reference tariff will be adjusted as per actually incurred prudent costs, subject to the maximum ceiling of 0.75% of the approved EPC cost, on annual basis upon production of authentic documentary evidence by the Petitioner. If no insurance cost has been incurred during the operation phase of the power plant or the same is part of the O&M cost, the assumed calculated tariff component shall be excluded from the tariff components at the COD stage.

iii) Adjustment for LIBOR variation

The interest part of foreign debt service component will remain unchanged throughout the term except for the adjustment due to variation in 6 months LIBOR, while spread of 0.60% on 6 months LIBOR remaining the same, according to the following formula:

$$\Delta I = P_{(REV)} * (LIBOR_{(REV)} - 1.49\%) / 2$$

Where:

$\Delta I$  = the variation in interest charges applicable corresponding to variation in 6 months LIBOR.  $\Delta I$  can be positive or negative depending upon whether 6 months LIBOR<sub>(REV)</sub> per annum > or < 1.49%. The interest payment obligation will be enhanced or reduced to the extent of  $\Delta I$  for each half year under adjustment.

$P_{(REV)}$  = is the outstanding principal (as indicated in the attached foreign debt service schedule to this order at Annex-II) on a bi-annual basis at the relevant calculations date.

Note:

Adjustments on account of inflation, foreign exchange rate variation, LIBOR variation and actual insurance will be approved and announced by the Authority within fifteen working days after receipt of the Petitioner's request for adjustment in tariff in accordance with the requisite indexation mechanism stipulated herein.



**V. Terms and Conditions of Tariff:**

**Design & Manufacturing Standards:**

Hydro power generation system shall be designed, manufactured and tested in accordance with the latest IEC standards or other equivalent standards. All plant and equipment shall be new.

**Emissions Trading/ Carbon Credits:**

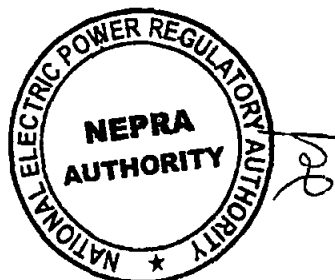
The Petitioner shall process and obtain emissions/carbon credits expeditiously and credit the proceeds to the Power Purchaser as per the applicable government policy and the terms and conditions agreed between the Petitioner and the Power Purchaser.

**Power Curve of the Hydel Power Complex:**

The power curve of the Hydel Power plant shall be verified by the Power Purchaser, as part of the Commissioning tests according to the latest IEC standards and shall be used to measure the performance of the hydel generating units.

**Others:**

- i. The Authority has allowed/approved only those cost(s), term(s), condition(s), provision(s), etc. which have been specifically approved in this tariff determination. Any cost(s), term(s), condition(s), provision(s), etc. contained in the tariff petition or any other document which are not specifically allowed/approved in this tariff determination, should not be implied to be approved, if not adjudicated upon in this tariff determination.
- ii. The above tariff and terms and conditions shall be incorporated as the specified tariff approved by the Authority pursuant to Rule 6 of the National Electric Power Regulatory Authority Licensing (Generation) Rules, 2000 in the power purchase agreement between the Petitioner and the Power Purchaser.
- iii. In case the PEDO wants to exit and sell the energy from Daral Khwar HPP to the buyer(s) other than the national grid/CPA-G/DISCOs then the terms of such arrangement shall be mutually agreed between parties to the EPA and, reflected in the draft EPA and submitted before the approval of the Authority.
- iv. 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 and consumers through a clawback mechanism to be decided by the Authority at the time of COD tariff adjustment.
- v. Pre COD sale of electricity is allowed to the Project company, subject to the terms and conditions of EPA, at the applicable tariff only including variable O&M component. However, pre-COD sales will not alter the required commercial operations date



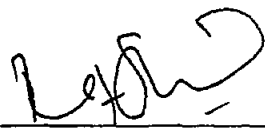
- vi. The order along with reference tariff table and debt service schedule as attached thereto are recommended for notification by the Federal Government in the official gazette in accordance with Section 31(7) of the Regulation of Generation, Transmission and Distribution of Electric Power Act, 1997.

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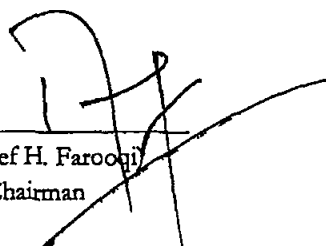
**AUTHORITY**



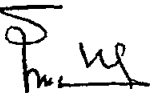
(Engr. Maqsood Anwar Khan)  
Member



(Engr. Rafique Ahmed Shaikh)  
Member



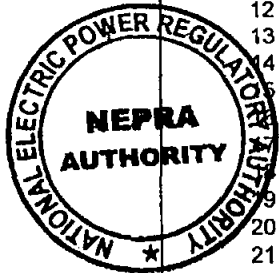
(Tauseef H. Farooqi)  
Chairman



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**DARAL KHWAR HPP**  
**36.6 MW REFERENCE TARIFF**

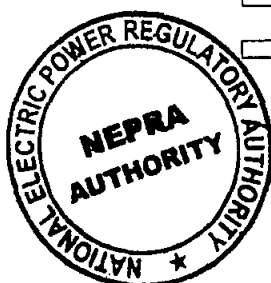
Year	Variable O&M Local	Variable O&M Foreign	Fixed O&M Local	Fixed O&M Foreign	Insurance	Return on Equity (ROE)	ROE During Construction	Debt Servicing (Local)	Debt Servicing (Foreign)	Total Tariff
	Rs./kWh	Rs./kWh	Rs./kWh	Rs./kWh	Rs./kWh	Rs./kWh	Rs./kWh	Rs./kWh	Rs./kWh	Rs./kWh
1	0.1114	0.1114	0.5346	0.1337	0.3554	1.7732	0.4516	4.7849	0.0121	8.2683
2	0.1114	0.1114	0.5346	0.1337	0.3554	1.7732	0.4516	4.7849	0.0121	8.2683
3	0.1114	0.1114	0.5346	0.1337	0.3554	1.7732	0.4516	4.7849	0.0121	8.2683
4	0.1114	0.1114	0.5346	0.1337	0.3554	1.7732	0.4516	4.7849	0.0121	8.2683
5	0.1114	0.1114	0.5346	0.1337	0.3554	1.7732	0.4516	4.7849	0.0121	8.2683
6	0.1114	0.1114	0.5346	0.1337	0.3554	1.7732	0.4516	4.7849	0.0121	8.2683
7	0.1114	0.1114	0.5346	0.1337	0.3554	1.7732	0.4516	4.7849	0.0121	8.2683
8	0.1114	0.1114	0.5346	0.1337	0.3554	1.7732	0.4516	4.7849	0.0121	8.2683
9	0.1114	0.1114	0.5346	0.1337	0.3554	1.7732	0.4516	4.7849	0.0121	8.2683
10	0.1114	0.1114	0.5346	0.1337	0.3554	1.7732	0.4516	4.7849	0.0121	8.2683
11	0.1114	0.1114	0.5346	0.1337	0.3554	1.7732	0.4516	4.7849	0.0121	8.2683
12	0.1114	0.1114	0.5346	0.1337	0.3554	1.7732	0.4516	4.7849	0.0121	8.2683
13	0.1114	0.1114	0.5346	0.1337	0.3554	1.7732	0.4516	4.7849	0.0121	8.2683
14	0.1114	0.1114	0.5346	0.1337	0.3554	1.7732	0.4516	4.7849	0.0121	8.2683
15	0.1114	0.1114	0.5346	0.1337	0.3554	1.7732	0.4516	4.7849	0.0121	8.2683
16	0.1114	0.1114	0.5346	0.1337	0.3554	1.7732	0.4516	4.7849	0.0121	8.2683
17	0.1114	0.1114	0.5346	0.1337	0.3554	1.7732	0.4516	4.7849	0.0121	8.2683
18	0.1114	0.1114	0.5346	0.1337	0.3554	1.7732	0.4516	4.7849	0.0121	8.2683
19	0.1114	0.1114	0.5346	0.1337	0.3554	1.7732	0.4516	4.7849	0.0121	8.2683
20	0.1114	0.1114	0.5346	0.1337	0.3554	1.7732	0.4516	4.7849	0.0121	8.2683
21	0.1114	0.1114	0.5346	0.1337	0.3554	1.7732	0.4516	4.7849	0.0121	8.2683
22	0.1114	0.1114	0.5346	0.1337	0.3554	1.7732	0.4516	4.7849	0.0121	8.2683
23	0.1114	0.1114	0.5346	0.1337	0.3554	1.7732	0.4516	4.7849	0.0121	8.2683
24	0.1114	0.1114	0.5346	0.1337	0.3554	1.7732	0.4516	4.7849	0.0121	8.2683
25	0.1114	0.1114	0.5346	0.1337	0.3554	1.7732	0.4516	4.7849	0.0121	8.2683
26	0.1114	0.1114	0.5346	0.1337	0.3554	1.7732	0.4516	4.7849	0.0121	8.2683
27	0.1114	0.1114	0.5346	0.1337	0.3554	1.7732	0.4516	4.7849	0.0121	8.2683
28	0.1114	0.1114	0.5346	0.1337	0.3554	1.7732	0.4516	4.7849	0.0121	8.2683
29	0.1114	0.1114	0.5346	0.1337	0.3554	1.7732	0.4516	4.7849	0.0121	8.2683
30	0.1114	0.1114	0.5346	0.1337	0.3554	1.7732	0.4516	4.7849	0.0121	8.2683
Levelized Tariff	0.1114	0.1114	0.5346	0.1337	0.3554	1.7732	0.4516	4.7849	0.0121	8.2683



**Darai Khwar  
Debt Servicing Schedule**

Annex II-A

Period	Local Debt					Annual Principal Repayment Rs./kWh	Annual Interest Rs./kWh	Annual Debt Servicing Rs./kWh
	Principal Million PKR	Repayment Million PKR	Mark-Up Million PKR	Balance Million PKR	Debt Service Million PKR			
1	6,870.44	16.74	349.71	6,851.70	368.44			
2	6,851.70	19.89	348.75	6,832.01	368.44			
3	6,832.01	20.69	347.75	6,811.32	368.44	0.2498	4.5354	4.7849
4	6,811.32	21.75	346.70	6,789.57	368.44			
5	6,789.57	22.85	345.59	6,766.72	368.44	0.2756	4.5084	4.7849
6	6,766.72	24.02	344.43	6,742.70	368.44			
7	6,742.70	25.24	343.20	6,717.47	368.44	0.3043	4.4806	4.7849
8	6,717.47	26.52	341.92	6,690.94	368.44			
9	6,690.94	27.87	340.57	6,663.07	368.44	0.3361	4.4498	4.7849
10	6,663.07	29.29	339.15	6,633.78	368.44			
11	6,633.78	30.78	337.66	6,603.00	368.44	0.3712	4.4137	4.7849
12	6,603.00	32.35	336.09	6,570.65	368.44			
13	6,570.65	34.00	334.45	6,536.65	368.44	0.4099	4.3750	4.7849
14	6,536.65	35.73	332.72	6,500.93	368.44			
15	6,500.93	37.54	330.90	6,463.38	368.44	0.4527	4.3322	4.7849
16	6,463.38	39.48	328.99	6,423.93	368.44			
17	6,423.93	41.48	326.98	6,382.46	368.44	0.5000	4.2849	4.7849
18	6,382.46	43.57	324.87	6,338.89	368.44			
19	6,338.89	45.79	322.65	6,293.10	368.44	0.5522	4.2327	4.7849
20	6,293.10	48.12	320.32	6,244.98	368.44			
21	6,244.98	50.57	317.87	6,194.40	368.44	0.6098	4.1751	4.7849
22	6,194.40	53.15	315.30	6,141.28	368.44			
23	6,141.28	55.85	312.59	6,085.40	368.44	0.6735	4.1114	4.7849
24	6,085.40	58.69	309.75	6,026.71	368.44			
25	6,026.71	61.68	306.76	5,965.03	368.44	0.7438	4.0411	4.7849
26	5,965.03	64.82	303.62	5,900.21	368.44			
27	5,900.21	68.12	300.32	5,832.09	368.44	0.8214	3.9635	4.7849
28	5,832.09	71.59	296.85	5,760.50	368.44			
29	5,760.50	75.23	293.21	5,685.26	368.44	0.9072	3.8777	4.7849
30	5,685.26	79.08	289.38	5,606.20	368.44			
31	5,606.20	83.09	285.36	5,523.12	368.44	1.0019	3.7830	4.7849
32	5,523.12	87.31	281.13	5,435.80	368.44			
33	5,435.80	91.78	276.68	5,344.04	368.44	1.1065	3.6784	4.7849
34	5,344.04	96.43	272.01	5,247.61	368.44			
35	5,247.61	101.34	267.10	5,146.28	368.44	1.2220	3.5629	4.7849
36	5,146.28	106.50	261.95	5,039.78	368.44			
37	5,039.78	111.92	256.52	4,927.86	368.44	1.3498	3.4354	4.7849
38	4,927.86	117.61	250.83	4,810.25	368.44			
39	4,810.25	123.60	244.84	4,686.65	368.44	1.4904	3.2945	4.7849
40	4,686.65	129.89	238.55	4,556.76	368.44			
41	4,556.76	136.50	231.94	4,420.26	368.44	1.6460	3.1389	4.7849
42	4,420.26	143.45	224.99	4,276.81	368.44			
43	4,276.81	150.75	217.69	4,126.05	368.44	1.8179	2.9671	4.7849
44	4,126.05	158.43	210.02	3,967.63	368.44			
45	3,967.63	166.49	201.95	3,801.14	368.44	2.0076	2.7773	4.7849
46	3,801.14	174.96	193.48	3,626.17	368.44			
47	3,626.17	183.67	184.57	3,442.31	368.44	2.2172	2.5677	4.7849
48	3,442.31	193.23	175.21	3,249.08	368.44			
49	3,249.08	203.06	165.38	3,046.01	368.44	2.4487	2.3363	4.7849
50	3,046.01	213.40	155.04	2,832.61	368.44			
51	2,832.61	224.28	144.18	2,608.35	368.44	2.7043	2.0806	4.7849
52	2,608.35	235.68	132.77	2,372.68	368.44			
53	2,372.68	247.67	120.77	2,125.00	368.44	2.9866	1.7983	4.7849
54	2,125.00	260.26	108.16	1,864.73	368.44			
55	1,864.73	273.53	94.91	1,591.20	368.44	3.2984	1.4868	4.7849
56	1,591.20	287.45	80.99	1,303.75	368.44			
57	1,303.75	302.08	66.36	1,001.67	368.44	3.6427	1.1422	4.7849
58	1,001.67	317.48	50.98	684.21	368.44			
59	684.21	333.82	34.83	350.60	368.44	4.0229	0.7620	4.7849
60	350.60	350.60	17.85	(0.00)	368.44			
61	884.21	82.67			736.88	4.4429	0.3420	4.7849



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Darat Khwar  
Debt Servicing Schedule

Annex II-B

Foreign Debt						Annual Principal Repayment	Annual Interest	Annual Debt Servicing
Period	Principal Million US\$	Repayment Million US\$	Mark-Up Million US\$	Balance Million US\$	Debt Service Million US\$	Rs./kWh	Rs./kWh	Rs./kWh
1	0.3981	0.0048	0.0041	0.3913	0.0089			
2	0.3913	0.0048	0.0041	0.3865	0.0089			
3	0.3865	0.0049	0.0040	0.3816	0.0089	0.0065	0.0056	0.0121
4	0.3816	0.0049	0.0040	0.3767	0.0089			
5	0.3767	0.0050	0.0039	0.3717	0.0089	0.0067	0.0055	0.0121
6	0.3717	0.0050	0.0039	0.3667	0.0089			
7	0.3667	0.0051	0.0038	0.3616	0.0089	0.0068	0.0053	0.0121
8	0.3616	0.0051	0.0038	0.3564	0.0089			
9	0.3564	0.0052	0.0037	0.3513	0.0089	0.0070	0.0052	0.0121
10	0.3513	0.0052	0.0037	0.3460	0.0089			
11	0.3460	0.0053	0.0036	0.3407	0.0089	0.0071	0.0050	0.0121
12	0.3407	0.0054	0.0036	0.3353	0.0089			
13	0.3353	0.0054	0.0035	0.3299	0.0089	0.0072	0.0049	0.0121
14	0.3299	0.0055	0.0034	0.3245	0.0089			
15	0.3245	0.0055	0.0034	0.3189	0.0089	0.0074	0.0047	0.0121
16	0.3189	0.0056	0.0033	0.3133	0.0089			
17	0.3133	0.0056	0.0033	0.3077	0.0089	0.0076	0.0046	0.0121
18	0.3077	0.0057	0.0032	0.3020	0.0089			
19	0.3020	0.0058	0.0032	0.2962	0.0089	0.0077	0.0044	0.0121
20	0.2962	0.0058	0.0031	0.2904	0.0089			
21	0.2904	0.0059	0.0030	0.2845	0.0089	0.0079	0.0042	0.0121
22	0.2845	0.0059	0.0030	0.2786	0.0089			
23	0.2786	0.0060	0.0029	0.2726	0.0089	0.0080	0.0041	0.0121
24	0.2726	0.0061	0.0028	0.2665	0.0089			
25	0.2665	0.0061	0.0028	0.2603	0.0089	0.0082	0.0039	0.0121
26	0.2603	0.0062	0.0027	0.2542	0.0089			
27	0.2542	0.0063	0.0027	0.2479	0.0089	0.0084	0.0037	0.0121
28	0.2479	0.0063	0.0026	0.2416	0.0089			
29	0.2416	0.0064	0.0025	0.2352	0.0089	0.0086	0.0036	0.0121
30	0.2352	0.0065	0.0025	0.2287	0.0089			
31	0.2287	0.0065	0.0024	0.2222	0.0089	0.0087	0.0034	0.0121
32	0.2222	0.0066	0.0023	0.2156	0.0089			
33	0.2156	0.0067	0.0023	0.2089	0.0089	0.0089	0.0032	0.0121
34	0.2089	0.0067	0.0022	0.2022	0.0089			
35	0.2022	0.0068	0.0021	0.1954	0.0089	0.0091	0.0030	0.0121
36	0.1954	0.0069	0.0020	0.1885	0.0089			
37	0.1885	0.0070	0.0019	0.1815	0.0089	0.0093	0.0028	0.0121
38	0.1815	0.0070	0.0019	0.1745	0.0089			
39	0.1745	0.0071	0.0018	0.1674	0.0089	0.0095	0.0026	0.0121
40	0.1674	0.0072	0.0017	0.1602	0.0089			
41	0.1602	0.0072	0.0017	0.1530	0.0089	0.0097	0.0024	0.0121
42	0.1530	0.0073	0.0016	0.1457	0.0089			
43	0.1457	0.0074	0.0015	0.1383	0.0089	0.0099	0.0022	0.0121
44	0.1383	0.0075	0.0014	0.1308	0.0089			
45	0.1308	0.0076	0.0014	0.1232	0.0089	0.0101	0.0020	0.0121
46	0.1232	0.0076	0.0013	0.1156	0.0089			
47	0.1156	0.0077	0.0012	0.1079	0.0089	0.0103	0.0018	0.0121
48	0.1079	0.0078	0.0011	0.1001	0.0089			
49	0.1001	0.0079	0.0010	0.0922	0.0089	0.0105	0.0016	0.0121
50	0.0922	0.0080	0.0010	0.0843	0.0089			
51	0.0843	0.0080	0.0009	0.0762	0.0089	0.0108	0.0014	0.0121
52	0.0762	0.0081	0.0008	0.0681	0.0089			
53	0.0681	0.0082	0.0007	0.0599	0.0089	0.0110	0.0011	0.0121
54	0.0599	0.0083	0.0006	0.0516	0.0089			
55	0.0516	0.0084	0.0005	0.0432	0.0089	0.0112	0.0009	0.0121
56	0.0432	0.0085	0.0005	0.0348	0.0089			
57	0.0348	0.0086	0.0004	0.0262	0.0089	0.0115	0.0007	0.0121
58	0.0262	0.0086	0.0003	0.0176	0.0089			
59	0.0176	0.0087	0.0002	0.0088	0.0089	0.0117	0.0004	0.0121
60	0.0088	0.0088	0.0001	-	0.0089			
61	0.0000	0.0176	0.0003	-	0.0178	0.0119	0.0002	0.0121

