



Registrar

# National Electric Power Regulatory Authority Islamic Republic of Pakistan

NEPRA Tower, Attaturk Avenue (East), G-5/1, Islamabad  
Ph: +92-51-9206500, Fax: +92-51-2600026  
Web: www.nepra.org.pk, E-mail: registrar@nepra.org.pk

No. NEPRA/R/TRF-479/HNDS-2019/6094-6096  
February 21, 2020

**Subject: Determination of National Electric Power Regulatory Authority in the matter of Tariff Petition filed by M/s. HNDS Energy (Private) Limited for Determination of Generation Tariff in respect of 50 MWp Solar Power Project (Case No. NEPRA/TRF-479/HNDS-2019)**

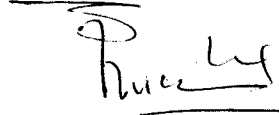
Dear Sir,

Please find enclosed herewith the subject Determination of the Authority along with Annex-I, II & III (25 pages) in Case No. NEPRA/TRF-479/HNDS-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. Order of the Authority along with Annex-I, II & III of the Determination are to be notified in the official Gazette.

Enclosure: As above

  
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( Syed Safeer Hussain )

Secretary  
Ministry of Energy (Power Division)  
'A' Block, Pak Secretariat  
Islamabad

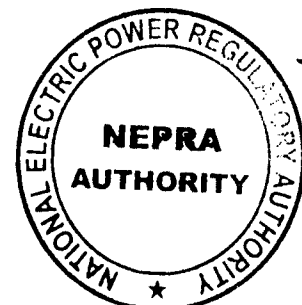
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1. Secretary, Cabinet Division, Cabinet Secretariat, Islamabad.
2. Secretary, Ministry of Finance, 'Q' Block, Pak Secretariat, Islamabad.

**DETERMINATION OF NATIONAL ELECTRIC POWER REGULATORY AUTHORITY**  
**IN THE MATTER OF TARIFF PETITION FILED BY M/S HNDS ENERGY (PVT.) LIMITED**  
**FOR DETERMINATION OF GENERATION TARIFF IN RESPECT**  
**OF 50 MWp SOLAR POWER PROJECT**

1. M/s HNDS Energy (Private) Limited (HEPL or the petitioner/company) filed a tariff petition before National Electric Power Regulatory Authority (NEPRA/the Authority) on July 24, 2019 for determination of generation tariff in respect of its 50 MWp solar power project (project) to be set up at Goth Gagrawara, Taluka Saleh Pat, District Sukkur, Sindh. This petition was filed by HEPL under the Regulation of Generation, Transmission and Distribution of Electric Power Act, 1997 (the NEPRA Act) and NEPRA (Tariff Standards & Procedure) Rules, 1998 (Tariff Rules). The petitioner has requested for the approval of levelized tariff of US Cents 5.3381/kWh (Rs. 8.0071/kWh) over the tariff control period of 25 years.
2. HEPL in its petition submitted that it was awarded tariff for the project by NEPRA vide its determination on January 25, 2018 (Tariff Determination). The same was intimated by the Authority to Federal Government for notification in the official gazette under the NEPRA Act. However, neither any such notification was made by Federal Government nor HEPL was issued the Letter of Support (LOS) by relevant agencies in spite of it being compliant with all the requirements of the Government of Pakistan's Policy for Development of Renewable Energy for Power Generation, 2006 (GOP RE Policy, 2006).
3. The petitioner submitted that this reluctance by relevant Government Agencies was as a result of Cabinet Committee of Energy's (CCOE) decision taken in December, 2017 (CCOE Decision) which halted progress of all renewable energy projects under pipeline, including of HEPL. Due to aforesaid inaction by the Government, the petitioner stated that it could not achieve Financial Close (FC) within the time allowed by NEPRA hence its determined tariff expired on January 24, 2019. It submitted that lately CCOE in February 2019 amended its earlier decision (Amended CCOE Decision) and reactivated the renewable energy projects which were in pipeline and were on halt. HEPL submitted that point V of the Amended CCOE decision provides the following:

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"All those projects which have been issued LOIs and have been granted tariff by NEPRA and issued a generation license will be allowed to proceed ahead towards the achievement of their requisite milestones as per RE Policy, 2006. However, if the tariff validity period has elapsed, NEPRA will be requested for review for the same to make it consistent with the current market environment and consumer interest. Such review will include appropriate time extension to reach financial closing."

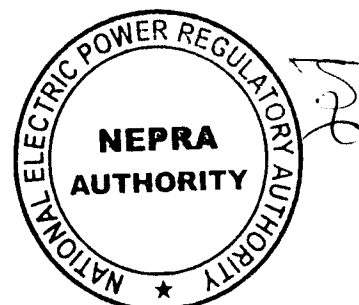
4. The petitioner also referred the point XI of the Amended CCOE decision which provides the following:

"Projects that are going back for review of tariff, will be asked to submit their applications on the basis of latest technology and technology related factors"

5. The petitioner submitted that this petition only contains information that has been demanded by the Amended CCOE Decision or is consequence of delay faced by HEPL in project development due to the failure of Government Agencies in following the GOP RE Policy, 2006. The petitioner submitted that all other information as contained in the original tariff petition and Tariff Determination be read as if incorporated in full herein. The petitioner requested to allow continuation of tariff structure and other terms & conditions as given in the Tariff Determination except for the following matters:

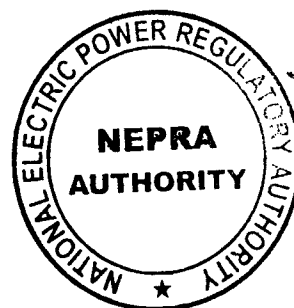
- Change in technology and resultant impact on Engineering, Procurement and Construction (EPC) Cost, Operation and Maintenance (O&M) Cost and Capacity Factor
- Project Development Cost (PDC)

6. HEPL further submitted that all project approvals including Letter of Intent (LOI), land, environment and interconnection, binding EPC arrangement for supply, construction, erection and commissioning of the project were already submitted under the earlier petition dated August 07, 2017. Further, it submitted that the project debt funding has also been arranged on the basis of earlier debt equity structure as approved by NEPRA and sponsors have also committed the required equity for the project.

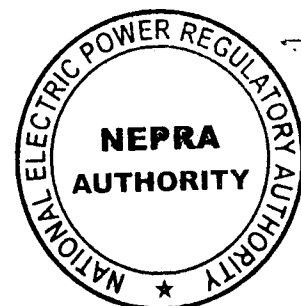


7. In accordance with Rule 4 of Tariff Rules, the tariff petition was admitted by the Authority for proceedings. Notice of Admission & Hearing was published in the daily national newspapers on December 6, 2019 stating the date of hearing along with salient features of the petition, issues framed for hearing and invitation to file comments/intervention request from the interested parties. Individual Notices of hearing were sent to the stakeholders, considered relevant by NEPRA, and the petitioner on December 18, 2019 for participation. Tariff petition and Notice of Admission & Hearing were also hosted on NEPRA's website for information of general public.
8. Following are the issues which were framed by the Authority for the hearing:
- Whether the claimed EPC cost is competitive, comparative and based on the firm and final agreement(s)?
  - 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?
  - Whether the petitioner's proposed solar modules technology satisfies the international standards of quality and operation?
  - Whether the claimed construction period is justified?
  - Whether the project grid interconnection study is approved by the relevant organization(s) and whether NTDCL has issued power evacuation certificate?
  - Any other issue with the approval of the Authority

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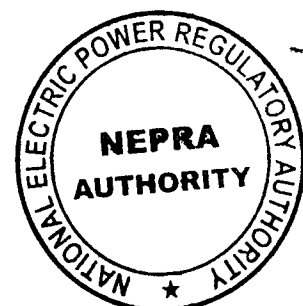


9. The hearing was held on December 19, 2019 (Thursday) at NEPRA Tower, G-5/1, Islamabad which was attended by a number of participants including the petitioner, representatives of power sector entities namely Laraib Energy, Bridge Factor and other stakeholders. In response to Notice of Admission & Hearing, no comments or intervention requests were submitted by any party.
10. Upon review of the tariff petition, a number of discrepancies were observed and HEPL was asked telephonically to submit clarifications thereon. In response, HEPL vide letter dated January 8, 2020 submitted that there is a typo error in tariff petition and stated that the amounts of "Financial Charges" and "Pre-Commercial Operations Date (COD) Insurance" have been mistakenly interchanged. In the said letter, HEPL forwarded corrected figures of Financial Charges and Pre-COD Insurance.
11. The issue wise submissions of the petitioner and the Authority's findings and decision thereon are as under:-
12. **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?**
  - 12.1 The petitioner has claimed USD 36.80 million on account of EPC cost. The Authority noted that in the Tariff Determination, the EPC cost of USD 37.275 million was allowed to HEPL against its claimed cost of around USD 43 million.
  - 12.2 The petitioner submitted that the EPC cost approved in Tariff Determination was based on polycrystalline silicon, double glass modules and single axis tracking structures. It stated that now it is considering state of the art bifacial mono crystalline technology from Tier 1 manufacturers (top 10) which in the opinion of the sponsors best suit the site conditions of the project. HEPL stated that project site is located in a desert area and has reflective sandy surface, therefore, use of bifacial panels would potentially improve the energy generation of project. From the energy yield assessment report as submitted by HEPL with the petition, it has been noted that the petitioner plans to install 131,580 Nos. mono crystalline bifacial PV modules of 380Wp. In addition, the said report states that 14 inverters of Sungrow SG3000HV have been selected for the project.



- 12.3 The petitioner has claimed USD 15.50 million (USD 0.310 million/MW) for the proposed bifacial mono crystalline modules. During the hearing, the petitioner while referring some data/graphs submitted that prices of bifacial mono crystalline module are around USD 0.41 million/MWp whereas HEPL has requested the module price of USD 0.31 million/MWp due to long-term relationship of Scatec (sponsor). Inverter cost of USD 0.04 million per MW has been claimed by the petitioner while submitting that the prices of inverters are at increasing trend in the international market, however, it has used the same cost as earlier allowed by NEPRA. The cost of USD 0.15 million per MW has been claimed for single axis mounting structures by HEPL while stating that it has used same benchmark price of mounting structure as was allowed in the Tariff Determination. The petitioner submitted that tracker based mounting structure for bifacial modules will be expensive compared to mounting structure for standard modules due to increased height and weight for attracting light at the back of the modules. For Balance of Plant (civil works, cables, transformer etc.), HEPL has claimed USD 11.80 million while informing that it has kept costs in respect of these items same as was allowed in the Tariff Determination. In addition, the petitioner submitted that claimed EPC includes the cost of on-site 33/132 KV substation.
- 12.4 Regarding the issue of compliance with NEPRA (Selection of EPC Contractor by IPPs) Guidelines, 2017 (NEPRA EPC Guidelines), the petitioner during hearing apprised that in its earlier petition it informed the Authority that it selected the EPC Contractor while following certain process. However, that process was not in consonance with NEPRA EPC Guidelines as same were not in field that time. The petitioner then submitted that it has filed the subject tariff petition while keeping the EPC contractor same as selected earlier and allowed by the Authority in Tariff Determination.
- 12.5 To evaluate the cost claim of the petitioner, 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 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 EPC cost that has been allowed recently to other comparable projects were also checked. On the basis of these workings, the Authority is of the view that EPC cost being claimed by HEPL is not reflective of prevailing prices and recent approvals given by NEPRA and therefore requires assessment.

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12.6 It has been noted that the average prices of solar modules of different types and brands have gone as low as USD 0.19 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 40% in the cost of modules in mere two years' time. The same trend of decreasing module prices is also being forecasted by different credible agencies; however, these sources state that the trend would not be that sharp. For the provision of this cost to HEPL, the relatively higher cost of proposed bifacial modules has been duly taken into account. 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. It has also been noted that the cost of USD 0.11 million per MW for tracking mounting structure has been achieved by a solar power project which has recently been commissioned. On these base figures, the factors such as transportation cost, existing local market conditions, local manufacturing base, favourable impact on cost due to development of three projects at same location by the sponsor, length of time allowed for achieving FC etc. were given due consideration. The costs of civil works and electrical balance of plant equipment have been allowed keeping in view the approvals given on these accounts in the recent tariffs of solar projects. It has also been ensured to provide a reasonable amount of profits to the Contractor(s). Keeping in view all these factors, the Authority has assessed the EPC cost of HEPL as USD 0.5565 million per MW (USD 27.825 million) which is hereby approved. The allowed EPC cost shall be adjusted at COD in accordance with the mechanism given in the Order part of this determination. The petitioner is hereby directed to file the request for modification of license for the change in technology (modules, inverters etc.) at the earliest.

13. **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?**

13.1 The petitioner has claimed USD 3.867 million on account of Non-EPC cost; break-up is as follows:

Non-EPC Cost	USD million
Project Development Cost	2.200
Pre-COD insurance	0.184

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Financial Fee & Charges	0.735
Interest during construction	0.748
<b>Total</b>	<b>3.867</b>

### Project Development Cost

- 13.2 The petitioner has submitted that PDC of USD 1.782 million was allowed by the Authority in Tariff Determination; however, USD 0.687 million has already been incurred till date. The petitioner has now claimed roughly USD 2.200 million under PDC head in the subject petition and provided following break-up with respect to its claim along with comparison to earlier approved amount:

Project Development Cost	Original Determination	Claimed Cost
	USD Million	
Consultancy cost & technical studies - Pre-FC	0.340	0.398
Owner's engineer supervision-post FC	0.067	0.067
Independent Engineer- Energy Purchase Agreement (EPA)	0.100	0.100
Permits, permissions and related costs	0.025	0.025
Site, security and infrastructure	1.000	1.000
Administration cost	0.150	0.273
Travelling costs	0.100	0.336
<b>Total</b>	<b>1.782</b>	<b>2.199</b>

- 13.3 In its petition and during the hearing, the petitioner gave detailed justification of its claim of each cost item. It is noted that the Authority had earlier allowed USD 1.782 million to HEPL while fixing the same in PKR at exchange rate of PKR 105/USD. In the subject petition, the PDC of around USD 2.200 million has been claimed by the petitioner due to change in technology and prolonged development period owing to no fault of the project company. The Authority considered the revised claim of PDC as submitted by the project company while comparing it with the PDC which has been allowed in the comparable solar power projects of different sizes. The factors such as PKR devaluation as well as local inflation that have occurred since the time Tariff Determination was approved have also been considered. In view thereof, the Authority has decided to allow USD 1.4





million to HEPL. This amount is being approved on lump sum basis, i.e. the cost incurred on individual heads of PDC may change but should not exceed the overall amount.

#### **Pre-COD insurance cost**

- 13.4 The Authority in the Tariff Determination allowed insurance during construction cost at the rate of 0.5% of the approved EPC cost and the petitioner in the subject tariff petition has requested to allow the same benchmark for the captioned cost. The Authority has noted that NEPRA (Benchmarks for Tariff Determination) Guidelines, 2018 (NEPRA Benchmark Guidelines) issued vide S.R.O. 763(I)/2018 notification dated June 19, 2018 states the provision of insurance during construction for solar projects at the rate of 0.40% of EPC cost. In accordance therewith, the Authority has decided to allow insurance during construction at the rate of 0.4%, inclusive of taxes, charges and/or duties, of the approved EPC cost to HEPL. On this basis, the amount being approved under this head works out to be around USD 0.111 million.

#### **Financing Fee and Charges**

- 13.5 The Authority in Tariff Determination allowed financing fee and charges as 2.5% of the approved debt portion of the allowed capital expenses (EPC, PDC and Insurance during construction). The petitioner in the subject tariff petition has requested to allow financial fees and charges based on the same benchmark. It has been noted that NEPRA Benchmark Guidelines states the provision of financing fee & charges not exceeding 2.00% of the approved debt amount. In light of said benchmark, the Authority has decided to allow these fee/charges at the rate of 2% of approved debt portion of allowed capital expenses, as maximum limit, to the petitioner. In accordance therewith, the amount being allowed under this head works out to be around USD 0.469 million.

#### **Interest during construction (IDC)**

- 13.6 The Authority in the Tariff Determination of HEPL allowed Interest during Construction (IDC) for the construction period of 10 months based on 100% foreign debt (75% of the project cost) with debt repayment period of 14 years while allowing cost of debt as 3 months LIBOR plus 4.25% spread over LIBOR. HEPL in the subject petition has requested to allow IDC based on the same parameters as were adopted by the Authority for the calculation of IDC in the Tariff Determination.

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- 13.7 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 0.536 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 are 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.
- 13.8 Recapitulating above, the summary of the approved project cost under various heads is given hereunder:

Project Cost	USD Million
EPC Cost	27.825
Project Development Cost	1.400
Insurance during construction	0.111
Financing Fee and Charges	0.469
Interest During Construction	0.536
<b>Total</b>	<b>30.342</b>

14. **Whether the claimed O&M costs are justified?**

- 14.1 HEPL in the subject tariff petition requested to allow an increase of 25% in the O&M cost earlier allowed by the Authority in the Tariff Determination. O&M cost of USD 0.7 million/year i.e. USD 14,000/MW/year was claimed by HEPL in the petition. Justifying the claimed increase, it stated that proposed bifacial modules technology requires higher maintenance and cleaning cost. During the hearing, however, the petitioner stated that the Authority had allowed O&M cost of USD 11,200/MWp in Tariff Determination, with local and foreign share of 50% each, and requested the Authority to allow the same.
- 14.2 To evaluate this claim of HEPL, the O&M cost allowed in the most recent tariffs of solar power projects has been considered. The cost recently being claimed by other solar power projects based on different technologies has also been compared. Further, the Authority has also taken into

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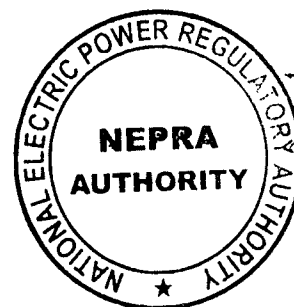
consideration the factor of economies of scale as the sponsor is developing 3 solar projects each having 50 MWp capacity. Based on these aspects, the Authority has decided to approve the O&M cost of USD 0.475 million per year to HEPL, i.e. USD 9,500 per MW per year.

- 14.3 To decide about the proportion of approved O&M cost, the Authority has examined the change in local CPI (allowed on local portion) viz a viz the collective change in both US CPI and exchange rate (allowed for foreign portion) for last nineteen years. It has been noted that the average annual change in indices allowed on foreign O&M component during the last couple of years has been higher relative to local inflation. However, the change in indices applied on local and foreign component has roughly been same when analysis is made for the longer term. Further, it has been studied that the majority of O&M cost for solar project consists of administrative expenses (either site or at office) and may be obtained in local currency. The cost of spare parts and replacement of equipment and some services might require procurement from abroad; however, their proportions are not very significant and also vary from year to year. In view of these considerations, the Authority has decided to allow whole of approved O&M cost in local currency. The approved O&M component shall be allowed adjustment as per the mechanism given in the Order part of this determination.

15. **Whether the claimed insurance during operation is justified?**

- 15.1 The Authority in the Tariff Determination allowed insurance during operations cost at 0.5% of the approved EPC cost. The petitioner in the current tariff petition has requested to allow the same benchmark for the operation phase insurance. The Authority noted that in the recently approved solar tariff determinations, insurance during operation at the rate of 0.4% of the approved EPC cost has been allowed. NEPRA Benchmark Guidelines also provide insurance during operation at the rate of 0.4% of EPC cost for solar 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, inclusive of 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.

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16. **Whether the claimed return on equity is justified?**

- 16.1 The Authority in the Tariff Determination allowed return on equity of 15%. The petitioner in the subject tariff petition has requested to allow the same level of return. It is noted that in the most recent comparable cases of renewable technologies, the return on equity of 14% has been allowed, therefore, the Authority has decided to allow same return on equity of 14% to HEPL.

17. **Whether the claimed financing/debt terms are justified?**

- 17.1 The petitioner submitted that the financing terms as approved in the Tariff Determination may be allowed. HEPL submitted that financing on the basis of earlier structure as approved by NEPRA has been arranged. Following financing/debt parameters regarding the debt arrangement were allowed by the Authority:

Debt : Equity	75:25
Debt	100% foreign
Interest	3 month LIBOR + 4.25%
Debt term	14 years

- 17.2 The Authority has noted that NEPRA Benchmark Guidelines provides 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 ratio capital structure. The debt to equity ratio of 80:20 has also been approved by the Authority in the recent wind and solar tariff determinations. Therefore, the Authority has decided to compute and approve tariff of HEPL at debt to equity ratio of 80:20.

- 17.3 Benchmarking Guidelines provide that in case of renewable energy projects eligible for securing debt under the revised State Bank of Pakistan Refinancing Scheme (SBP Scheme), a flat rate of 6% shall be approved with debt repayment period not exceeding 12 years. For foreign financing, Benchmarking Guidelines say that spread not exceeding 4.25% over LIBOR shall be approved. The size of the project being setup by the petitioner is 50 MW which makes it eligible to avail financing under SBP scheme. However, it has been noted that SBP vide its circular dated July 26, 2019 has decided that eligible renewable energy projects of more than 20MW shall be given

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financing of up to 50% under SBP Scheme. In view thereof, the Authority has decided to compute and approve tariff of HEPL at 50% local and 50% foreign financing. For local loan, the cost of 6% as stated in the SBP Scheme has been taken into account. For the foreign loan, the cost of 6.158% (LIBOR of 1.90838% + spread of 4.25%) has been used.

17.4 The petitioner has claimed debt servicing period of fourteen years for foreign financing. The Authority in recently approved wind and solar tariff determinations has allowed foreign debt repayment period of not less than thirteen years. In view of approvals given in the recent tariff determinations, the Authority has decided to approve foreign debt repayment period of 14 years as claimed by the petitioner. For local loan under SBP scheme, the debt repayment period has been spread over 10 years.

18. **Whether the claimed annual energy production 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?**

18.1 The petitioner has submitted the following in this regard:

Project capacity	50 MWp
Annual power generation	100.740 GWh
Net annual capacity factor	23%

18.2 HEPL submitted that earlier tariff was approved based on polycrystalline silicon double glass modules with single axis tracking mounting structures; however, in the subject petition, it has proposed to install bifacial mono crystalline Tier 1 modules on single axis tracking. The petitioner stated that the project site is located in a desert area and has reflective sandy surface, therefore, use of bifacial panels would potentially improve the energy generation of the project.

18.3 The petitioner has submitted that it has selected this technology considering the best interest of consumers and the solar industry of Pakistan and to seek innovation and introduction of state of the art technology. It submitted that project sponsor is well experienced in realizing bankable solar



PV projects with bifacial panels. The petitioner submitted that as a result of change in technology from polycrystalline silicon to bifacial, the capacity factor for the project will be increased from 22.21% to 23% with an energy generation of 100,740,000 kWh per annum. HEPL submitted that the proposed capacity factor is higher than all the projects currently in development or in operations. The yield assessment report was also submitted by HEPL along with its petition.

- 18.4 The Authority has considered the modules and inverters proposed by HEPL with respect to their quality and energy yield. The energy yield report as submitted by the petitioner has also been examined. On these bases, the Authority is of the view that the proposed net annual capacity utilization factor of 23% is slightly on lower side. The Authority has decided to approve the tariff of the petitioner on net annual capacity utilization factor of 23.27%. Further, the Authority has decided that 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 energy produced beyond the approved annual capacity utilization factor.

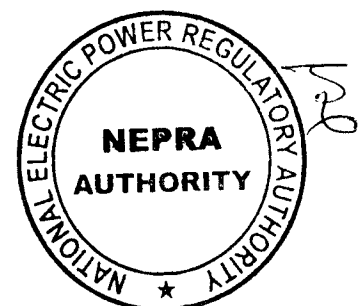
19. **Whether the claimed construction period is justified?**

- 19.1 The Authority in the Tariff Determination allowed construction period of 10 months. HEPL in the subject petition has requested to allow same construction period of 10 months. The Authority has considered the submissions of the petitioner and has decided to approve 10 months construction period as allowed in the projects of similar scale by the Authority.

20. **Whether the project grid interconnection study is approved by the relevant organization(s) and whether NTDCL has issued power evacuation certificate?**

- 20.1 The petitioner submitted that the requisite NTDCL's Grid Interconnection Study (GIS) approval was received in April 2017. It submitted that the interconnection approval has already been submitted with NEPRA in the earlier tariff petition dated August 7, 2017. For tariff purpose, the Authority is cognizant that the requirement of approval of GIS/power evacuation certificate is not given in the Tariff Rules. This issue was framed to confirm that the integration of the subject project does not affect the grid system. Hence, the Authority has decided to proceed further in the matter as per the stipulations given in the said Rules. However, the petitioner is again hereby directed to file the request for modification of license for the proposed change in technology at the earliest.

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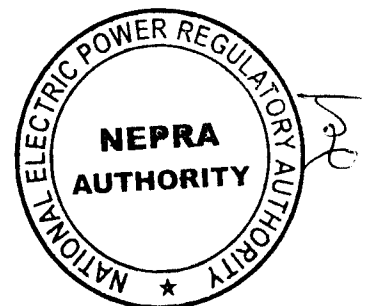


21. **ORDER**

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 HNDS Energy (Pvt.) Limited (HEPL) for its 50 MWp solar power project for delivery of electricity to the power purchaser as follows:

- Levelized tariff works out to be Rs. 5.6988/kWh (US Cents 3.6683/kWh).
- The tariff has been worked out on Build Own and Operate basis.
- EPC cost of USD 27.825 million has been approved.
- Project Development Cost of USD 1.400 million has been approved.
- Insurance during construction at the rate of 0.4% of the approved EPC cost has been approved.
- Financing fee 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.
- Financing mix of 50% local and 50% foreign has been used.
- ROE and Return on Equity during Construction (ROEDC) of 14% has been allowed.
- The cost of debt of 6% (SBP scheme) has been used for local financing.
- The cost of debt of 3 month LIBOR (1.90838%) + spread (4.25%) has been used for foreign financing.
- Debt servicing period of 10 years from COD has been used for local financing under SBP scheme.
- Debt servicing period of 14 years from COD has been used for foreign financing.
- O&M Cost of USD 9,500 per MW per year has been allowed.
- Insurance during Operation has been calculated as 0.40% of the allowed EPC Cost.
- Construction period of 10 months has been allowed.
- Net Annual Plant Capacity Factor of 23.27% has been approved.

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- Degradation factor of 0.5% per year has been approved. The financial impact of the allowed degradation of USD 1.007 million has been taken into account in the approved project cost.
- Reference Exchange Rates of 155.35 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	6.67%
Month 8	6.67%
Month 9	13.33%
Month 10	13.33%

- Detailed component wise tariff is attached as Annex-I of this decision.
- Debt Servicing Schedule for local loan is attached as Annex-II of this decision.
- Debt Servicing Schedule for foreign loan is attached as Annex-III of this decision.

**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 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

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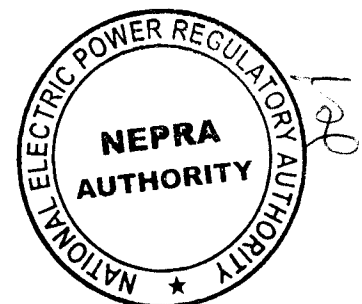
amounts allowed on these accounts in USD will be converted in PKR using the reference PKR/USD rate of 155.35 to calculate the maximum limit of the amount to be allowed at COD.

- 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 10 months starting from the date of FC. For foreign loan, the IDC shall also be allowed adjustment for change in applicable LIBOR.
- 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 10 months from the date of FC.
- For foreign and local loans, the savings in the approved spreads shall be shared between the power purchaser and power producer in the ratio of 60:40.

#### **B. Indexations**

Adjustment of O&M, ROE, ROEDC, applicable Debt Servicing Components shall be made on quarterly basis to be applicable from 1st July, 1st October, 1st January and 1st April. Adjustment of Debt Servicing Component, where applicable, may also be allowed on bi-annual basis depending upon the final terms approved by the Authority at the time of COD. For bi-annual adjustments, the periods shall start from 1st July and 1st January. Insurance component shall be adjusted on annual basis starting from either 1<sup>st</sup> January or 1<sup>st</sup> July. The indexation mechanisms are given hereunder:

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i) **Operation and Maintenance Costs**

O&M component of tariff shall be adjusted on account of change in local Inflation (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 CPI (General)
CPI (REF)	=	The reference CPI (General) of 263.59 for the month of November, 2019

*Note: The reference index of 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 CPI value for the middle month of preceding quarter prior to the date of COD shall be considered. Thereafter, the 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. 155.35/USD
P (Act)	=	Actual premium or 0.4% of the approved EPC Cost converted into Pak Rupees on exchange rate prevailing on 1 <sup>st</sup> day of the insurance coverage period whichever is lower

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iii) **Return on Equity**

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

ROE (Rev)	=	ROE (Ref) * ER (Rev) / ER (Ref)
Where;		
ROE (Rev)	=	Revised ROE Component of Tariff
ROE (Ref)	=	Reference ROE Component of Tariff
ER (Rev)	=	The revised TT & OD selling rate of US dollar as notified by the National Bank of Pakistan
ER (Ref)	=	The reference TT & OD selling rate of Rs. 155.35/USD

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

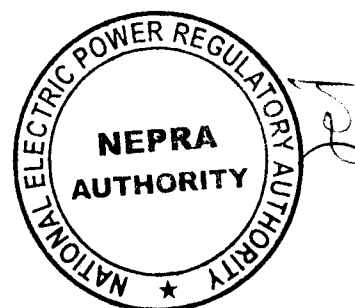
iv) **Indexations applicable to debt**

For foreign debt, respective principal and interest components will be adjusted on quarterly/bi-annual basis, on account of revised TT & OD selling rate of US Dollar, as notified by the National Bank of Pakistan as at the last day of the preceding period, over the applicable reference exchange rate as approved at COD.

v) **Variations in LIBOR**

The interest part of tariff component for the foreign loan shall remain unchanged throughout the term except for the adjustment due to variation in interest rate as a result of variation in LIBOR according to the following formula:

*[Handwritten signature]*



$\Delta I$	=	$P (REV) * (LIBOR (REV) - 1.90838\%) / 4$
Where;		
$\Delta I$	=	The variation in interest charges applicable corresponding to variation in 3 month LIBOR. $\Delta I$ can be positive or negative depending upon whether 3 month LIBOR (REV) per annum > or < 1.90838%. The interest payment obligation will be enhanced or reduced to the extent of $\Delta I$ for each quarter under adjustment.
$P (REV)$	=	The outstanding principal (as indicated in the attached debt service schedule to this order), at the relevant quarterly calculations date. Quarter 1 shall commence on the commercial operations date (i.e. the first figure will be used for the purposes of calculation of interest for the first quarter after commercial operations date)
$LIBOR (REV)$	=	Revised 3 month LIBOR as at the last day of the preceding quarter.

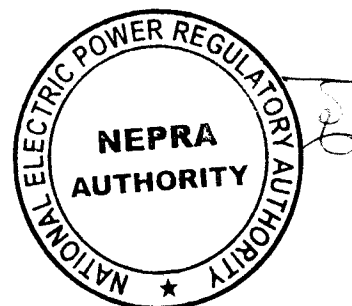
*Note: The reference tariff component shall be revised after making the required adjustments at the time of COD.*

### 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 at the time of the commissioning of the plant duly appointed by the power purchaser.
- This tariff will be limited to the extent of net annual energy generation supplied to the power purchaser up to 23.27% net annual plant capacity factor. Net annual energy generation supplied to the power purchaser in a year, in excess of 23.27% net annual plant capacity factor, will be charged at the following tariffs:

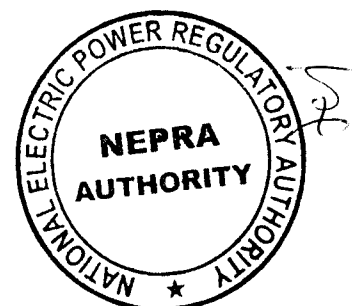
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<u>Net annual plant capacity factor</u>	<u>% of prevalent tariff allowed to power producer</u>
Above 23.27% to 23.35%	-
Above 23.35% to 24.10%	20%
Above 24.10% to 24.85%	40%
Above 24.85% to 25.60%	60%
Above 25.60%	70%

- The risk of solar resource shall be borne by the power producer.
- The maximum plant PV capacity shall not exceed 50 MWp.
- 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 required to ensure that all the equipment is installed as per the details/specifications given in the generation license and tariff determination.
- 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. The savings in the approved limit of spread over foreign loan shall also be shared between power purchaser and power producer in the ratio of 60:40 at the time of COD or during any time of loan tenor, as applicable.
- 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.

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- The targeted maximum construction period from prescribed date/time of FC is 10 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 10 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 applicable 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 passed 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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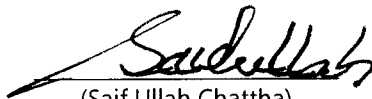






22. The Order part along with 3 Annexures is recommended for notification by the Federal Government in the official gazette in accordance with Section 31(7) of the Regulation of Generation, Transmission and Distribution of Electric Power Act, 1997.

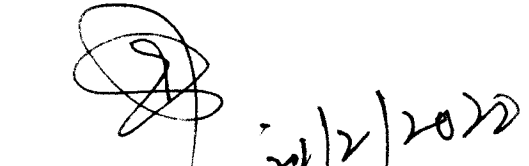
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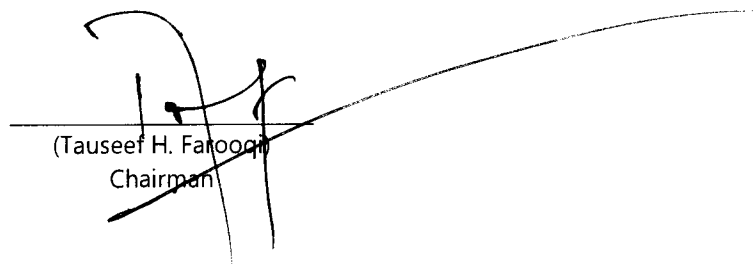
**AUTHORITY**

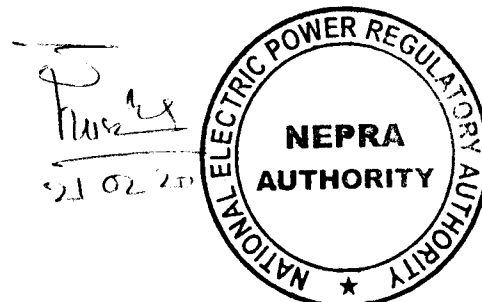
  
(Saif Ullah Chattha)  
Member 21.2.2020

  
(Rafique Ahmed Shaikh)  
Member

  
(Eng. Bahadur Khan)  
Member

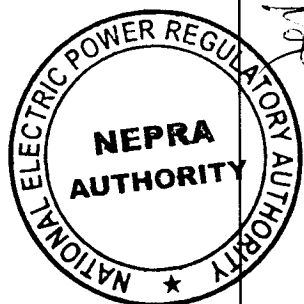
  
(Rehmatullah Baloch)  
Vice Chairman

  
(Tauseef H. Farooqi)  
Chairman



**HNDS ENERGY (PVT.) LIMITED**  
**REFERENCE TARIFF TABLE**

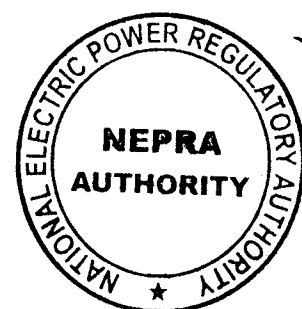
Year	O&M Local	Insurance	Return on Equity	Return on Equity during Construction	Principal Repayment	Interest Charges	Tariff
	Rs. / kWh	Rs. / kWh	Rs. / kWh	Rs. / kWh	Rs. / kWh	Rs. / kWh	Rs. / kWh
1	0.7240	0.1696	1.3379	0.0758	2.3312	2.2715	6.9101
2	0.7240	0.1696	1.3379	0.0758	2.4757	2.1270	6.9101
3	0.7240	0.1696	1.3379	0.0758	2.6292	1.9735	6.9101
4	0.7240	0.1696	1.3379	0.0758	2.7922	1.8105	6.9101
5	0.7240	0.1696	1.3379	0.0758	2.9653	1.6374	6.9101
6	0.7240	0.1696	1.3379	0.0758	3.1492	1.4535	6.9101
7	0.7240	0.1696	1.3379	0.0758	3.3444	1.2583	6.9101
8	0.7240	0.1696	1.3379	0.0758	3.5518	1.0509	6.9101
9	0.7240	0.1696	1.3379	0.0758	3.7720	0.8307	6.9101
10	0.7240	0.1696	1.3379	0.0758	4.0059	0.5969	6.9101
11	0.7240	0.1696	1.3379	0.0758	1.6406	0.4066	4.3545
12	0.7240	0.1696	1.3379	0.0758	1.7440	0.3032	4.3545
13	0.7240	0.1696	1.3379	0.0758	1.8539	0.1933	4.3545
14	0.7240	0.1696	1.3379	0.0758	1.9707	0.0764	4.3545
15	0.7240	0.1696	1.3379	0.0758	-	-	2.3074
16	0.7240	0.1696	1.3379	0.0758	-	-	2.3074
17	0.7240	0.1696	1.3379	0.0758	-	-	2.3074
18	0.7240	0.1696	1.3379	0.0758	-	-	2.3074
19	0.7240	0.1696	1.3379	0.0758	-	-	2.3074
20	0.7240	0.1696	1.3379	0.0758	-	-	2.3074
21	0.7240	0.1696	1.3379	0.0758	-	-	2.3074
22	0.7240	0.1696	1.3379	0.0758	-	-	2.3074
23	0.7240	0.1696	1.3379	0.0758	-	-	2.3074
24	0.7240	0.1696	1.3379	0.0758	-	-	2.3074
25	0.7240	0.1696	1.3379	0.0758	-	-	2.3074
<b>Levelized Tariff</b>	<b>0.7240</b>	<b>0.1696</b>	<b>1.3379</b>	<b>0.0758</b>	<b>2.2442</b>	<b>1.1472</b>	<b>5.6988</b>





**HNDS ENERGY (PVT.) LIMITED**  
**DEBT SERVICING SCHEDULE - LOCAL**

Relevant Quarters	Base amount (Rs.)	Principal Repayment (Rs.)	Interest (Rs.)	Balance Principal (Rs.)	Total Debt Service (Rs.)	Annual Principal Payment (kWh)	
1	1,948,056,845	35,897,042	29,220,853	1,912,159,804	65,117,894	1.4408	1.1148
2	1,912,159,804	36,435,497	28,682,397	1,875,724,306	65,117,894		
3	1,875,724,306	36,982,030	28,135,865	1,838,742,277	65,117,894		
4	1,838,742,277	37,536,760	27,581,134	1,801,205,516	65,117,894		
5	1,801,205,516	38,099,812	27,018,083	1,763,105,705	65,117,894	1.5292	1.0264
6	1,763,105,705	38,671,309	26,446,586	1,724,434,396	65,117,894		
7	1,724,434,396	39,251,378	25,866,516	1,685,183,018	65,117,894		
8	1,685,183,018	39,840,149	25,277,745	1,645,342,869	65,117,894		
9	1,645,342,869	40,437,751	24,680,143	1,604,905,118	65,117,894	1.6231	0.9325
10	1,604,905,118	41,044,318	24,073,577	1,563,860,800	65,117,894		
11	1,563,860,800	41,659,982	23,457,912	1,522,200,818	65,117,894		
12	1,522,200,818	42,284,882	22,833,012	1,479,915,936	65,117,894		
13	1,479,915,936	42,919,155	22,198,739	1,436,996,781	65,117,894	1.7227	0.8329
14	1,436,996,781	43,562,943	21,554,952	1,393,433,838	65,117,894		
15	1,393,433,838	44,216,387	20,901,508	1,349,217,451	65,117,894		
16	1,349,217,451	44,879,633	20,238,262	1,304,337,819	65,117,894		
17	1,304,337,819	45,552,827	19,565,067	1,258,784,992	65,117,894	1.8284	0.7272
18	1,258,784,992	46,236,119	18,881,775	1,212,548,873	65,117,894		
19	1,212,548,873	46,929,661	18,188,233	1,165,619,211	65,117,894		
20	1,165,619,211	47,633,606	17,484,288	1,117,985,605	65,117,894		
21	1,117,985,605	48,348,110	16,769,784	1,069,637,495	65,117,894	1.9406	0.6150
22	1,069,637,495	49,073,332	16,044,562	1,020,564,163	65,117,894		
23	1,020,564,163	49,809,432	15,308,462	970,754,731	65,117,894		
24	970,754,731	50,556,573	14,561,321	920,198,158	65,117,894		
25	920,198,158	51,314,922	13,802,972	868,883,236	65,117,894	2.0596	0.4959
26	868,883,236	52,084,646	13,033,249	816,798,590	65,117,894		
27	816,798,590	52,865,915	12,251,979	763,932,675	65,117,894		
28	763,932,675	53,658,904	11,458,990	710,273,771	65,117,894		
29	710,273,771	54,463,788	10,654,107	655,809,983	65,117,894	2.1860	0.3695
30	655,809,983	55,280,745	9,837,150	600,529,239	65,117,894		
31	600,529,239	56,109,956	9,007,939	544,419,283	65,117,894		
32	544,419,283	56,951,605	8,166,289	487,467,678	65,117,894		
33	487,467,678	57,805,879	7,312,015	429,661,799	65,117,894	2.3202	0.2354
34	429,661,799	58,672,967	6,444,927	370,988,831	65,117,894		
35	370,988,831	59,553,062	5,564,832	311,435,770	65,117,894		
36	311,435,770	60,446,358	4,671,537	250,989,412	65,117,894		
37	250,989,412	61,353,053	3,764,841	189,636,359	65,117,894	2.4625	0.0930
38	189,636,359	62,273,349	2,844,545	127,363,010	65,117,894		
39	127,363,010	63,207,449	1,910,445	64,155,561	65,117,894		
40	64,155,561	64,155,561	962,333	(0)	65,117,894		



**HNDS ENERGY (PVT.) LIMITED**  
**DEBT SERVICING SCHEDULE - FOREIGN**

Relevant Quarters	Base amount (USD)	Principal Repayment (USD)	Interest (USD)	Balance Principal (USD)	Total Debt Service (USD)	Debt Service Ratio	Debt Service Coverage Ratio
1	12,539,793	142,714	193,062	12,397,079	335,776	0.8904	1.1568
2	12,397,079	144,911	190,865	12,252,169	335,776		
3	12,252,169	147,142	188,634	12,105,027	335,776		
4	12,105,027	149,407	186,368	11,955,620	335,776		
5	11,955,620	151,707	184,068	11,803,912	335,776	0.9465	1.1006
6	11,803,912	154,043	181,732	11,649,869	335,776		
7	11,649,869	156,415	179,361	11,493,454	335,776		
8	11,493,454	158,823	176,953	11,334,631	335,776		
9	11,334,631	161,268	174,507	11,173,363	335,776	1.0062	1.0410
10	11,173,363	163,751	172,025	11,009,612	335,776		
11	11,009,612	166,272	169,503	10,843,340	335,776		
12	10,843,340	168,832	166,944	10,674,508	335,776		
13	10,674,508	171,431	164,344	10,503,077	335,776	1.0696	0.9776
14	10,503,077	174,071	161,705	10,329,006	335,776		
15	10,329,006	176,751	159,025	10,152,255	335,776		
16	10,152,255	179,472	156,304	9,972,783	335,776		
17	9,972,783	182,235	153,540	9,790,548	335,776	1.1370	0.9102
18	9,790,548	185,041	150,735	9,605,507	335,776		
19	9,605,507	187,890	147,886	9,417,618	335,776		
20	9,417,618	190,782	144,993	9,226,835	335,776		
21	9,226,835	193,720	142,056	9,033,116	335,776	1.2086	0.8385
22	9,033,116	196,702	139,073	8,836,414	335,776		
23	8,836,414	199,731	136,045	8,636,683	335,776		
24	8,636,683	202,806	132,970	8,433,877	335,776		
25	8,433,877	205,928	129,848	8,227,949	335,776	1.2848	0.7624
26	8,227,949	209,098	126,677	8,018,851	335,776		
27	8,018,851	212,318	123,458	7,806,533	335,776		
28	7,806,533	215,587	120,189	7,590,947	335,776		
29	7,590,947	218,906	116,870	7,372,041	335,776	1.3658	0.6814
30	7,372,041	222,276	113,500	7,149,765	335,776		
31	7,149,765	225,698	110,077	6,924,067	335,776		
32	6,924,067	229,173	106,603	6,694,894	335,776		
33	6,694,894	232,701	103,074	6,462,192	335,776	1.4518	0.5953
34	6,462,192	236,284	99,492	6,225,908	335,776		
35	6,225,908	239,922	95,854	5,985,987	335,776		
36	5,985,987	243,616	92,160	5,742,371	335,776		
37	5,742,371	247,366	88,409	5,495,005	335,776	1.5433	0.5038
38	5,495,005	251,175	84,601	5,243,830	335,776		
39	5,243,830	255,042	80,734	4,988,788	335,776		
40	4,988,788	258,968	76,807	4,729,820	335,776		
41	4,729,820	262,956	72,820	4,466,864	335,776	1.6406	0.4066
42	4,466,864	267,004	68,772	4,199,860	335,776		
43	4,199,860	271,115	64,661	3,928,745	335,776		
44	3,928,745	275,289	60,487	3,653,457	335,776		
45	3,653,457	279,527	56,248	3,373,929	335,776	1.7440	0.3032
46	3,373,929	283,831	51,945	3,090,099	335,776		
47	3,090,099	288,201	47,575	2,801,898	335,776		
48	2,801,898	292,638	43,138	2,509,261	335,776		
49	2,509,261	297,143	38,632	2,212,117	335,776	1.8539	0.1933
50	2,212,117	301,718	34,058	1,910,399	335,776		
51	1,910,399	306,363	29,412	1,604,036	335,776		
52	1,604,036	311,080	24,696	1,292,956	335,776		
53	1,292,956	315,869	19,906	977,087	335,776	1.9707	0.0764
54	977,087	320,732	15,043	656,355	335,776		
55	656,355	325,670	10,105	330,684	335,776		
56	330,684	330,684	5,091	0	335,776		

