



National Electric Power Regulatory Authority

Islamic Republic of Pakistan

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Registrar

No.NEPRA/R/TRF-77/GEPL-2007/1350-52

December 6, 2008

Subject: **Determination of the Authority in the Matter of Tariff Petition filed by Green Electric (Pvt.) Ltd. (GEPL) (Case # NEPRA/TRF-77/GEPL-2007)**
Intimation of Determination of Tariff pursuant to Section 31(4) of the Regulation of Generation, Transmission and Distribution of Electric Power Act (XL of 1997)

Dear Sir,

Please find enclosed the subject Determination of the Authority along with Annexure-I & II (33 pages) in Case No. NEPRA/TRF-77/GEPL-2007.

2. The Determination is being intimated to the Federal Government for the purpose of notification of the approved tariff in the official gazette pursuant to Section 31(4) of the Regulation of Generation, Transmission and Distribution of Electric Power Act (XL of 1997) and Rule 16(11) of the National Electric Power Regulatory Authority Tariff (Standards and Procedure) Rules, 1998.

3. Please note that only Order of the Authority at para 19.2 of the Determination relating to the reference tariff, adjustments & indexation along with Annexure-I & II needs to be notified in the official gazette.

Enclosure: As above

The Secretary
Cabinet Division
Government of Pakistan
Cabinet Secretariat
Islamabad

CC:

1. Secretary, Ministry of Water & Power, Islamabad.
2. Secretary, Ministry of Finance, Islamabad.


(Hussain Zaigham)



**NATIONAL ELECTRIC POWER REGULATORY AUTHORITY
(NEPRA)**

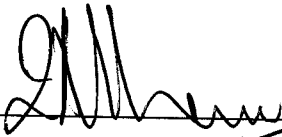
No. NEPRA/TRF-77/GEPL-2008

Petitioner

Green Electric (Pvt.) Ltd. (GEPL)
15- Peshawar Block, Fortress Stadium, Lahore

AUTHORITY

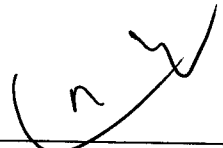
Zafar Ali Khan
Member


5/12/08

Ghiasuddin Ahmed
Member

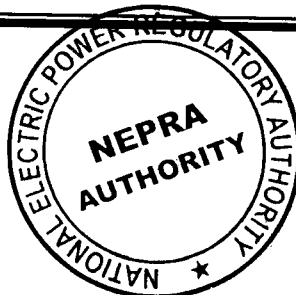

5/12

Maqbool Ahmad Khawaja
Member/Vice Chairman



Khalid Saeed
Chairman

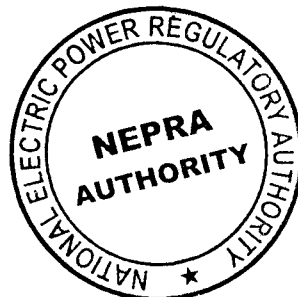






BACKGROUND

- 1.1 Green Electric (Private) Limited (the "Company") (GEPL) is a private limited company registered under the Companies Ordinance 1984. The Company intends to establish a power generation project having a capacity of about 405 MW at Deh Pipri, District of Dadu, Sind Province in two phases of about 205 MW and 200 MW, to be operated on low-Btu gas from Zamzama gas field and with HSD as backup fuel to be used during gas interruptions. Feasibility report for the project was approved by the Private Power and Infrastructure Board (PPIB) vide letter dated November 11 2006. The Government of Pakistan (GOP) has placed 40 mmscfd of gas at PPIB's disposal for this project as intimated by the PPIB vide letter dated December 30 2006. Hence, Phase I of the project could be implemented immediately. Thus, GEPL filed a tariff petition for the approval of its generation tariff for 191.5 MW (Gross ISO conditions) Phase I, combined cycle power plant at Dadu, Sind.
- 1.2 The Authority admitted the tariff petition of Green Electric (Pvt.) Ltd. (GEPL) on May 29, 2007. Notice of Admission/Public Hearing in the matter was published in major national newspapers on June 11, 2007 to inform all the stakeholders. Hearing was held on June 28, 2007. All the stakeholders attended the meeting. During the hearing the Authority observed that the petitioner did not finalize its equipment and its Engineering Procurement and Construction (EPC) price was not firm (non-reopenable) in accordance with the ECC's decision. The Authority while pending the proceedings directed the petitioner to first finalize the equipment and firm up the EPC Price.
- 1.3 Finally, GEPL vide their letter # GEL/ NEPRA / 18, dated June 10, 2008 informed the Authority that they have eventually executed the following EPC documents for the Project on June 7 2008:
- Contract Agreement for the Engineering, Procurement and Manufacture of Equipment with China National Machinery & Equipment Import and Export Corporation (CMEC);
 - Contract Agreement for the Construction and Provision of Certain Deliveries with China East Resource Import & Export Corporation (CERIEC); and
 - Coordination Agreement for the Engineering, Procurement and Construction of the Green Electric Project with CMEC and CERIEC.
 - On the basis of selected equipment, the Plant capacity at generator terminals (ISO) would be 188 MW (on Gas) and 183 MW (on HSD). The total contract price is as under :



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	Euro Portion	USD Portion
• E&P Contract	25,685,000	105,000,000
• Construction Contract		17,632,757
• Total	25,685,000	122,632,757
• Total in Equivalent USD		162,582,520

(Exchange rate as on 31st May 2008: 1 Euro = 1.5553 USD)

1.4 The Authority on the basis of fresh evidence decided to hold a second hearing on September 14 2008 at the main office of NEPRA. Accordingly, all the key stakeholders were informed through publication in the major national newspapers regarding the second hearing. Letters were also sent to the key stakeholders and the hearing was attended by all.

2. Relief Sought

The petitioner vide its letter # GEPL / NEPRA /18 dated June 10 , 2008 had requested for the approval of following generation tariff on gas and HSD respectively for a period of 30 year:

	Capacity Purchase Price (CPP) Rs./kWh	Energy Charge Rs./kWh	Total Tariff Rs./kWh	Total Tariff US cents/ kWh
Levellized Tariff on Gas	2.4799	2.2793	4.7592	7.15673
Levellized Tariff on HSD	2.5237	9.6638	12.1875	18.3270

Exchange rate \$1 = Pak Rs.66.50

3. ISSUES

In light of the information provided by the petitioner, comments received from the Central Power Purchasing Agency (CPPA) and the proceedings of the case, the following main issues have been framed and discussed for consideration of the Authority:

- Delay in finalizing firm EPC
- Net Plant Capacity & Tariff on HSD
- Project Cost
 - EPC Cost
 - Non-EPC Cost



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- Financial Fees & Charges
- Interest During Construction (IDC)
- Capacity Charge
- Energy Charge
- Timeline of the Project

4. **Delay in finalizing firm EPC**

- 4.1 During the hearing, the Authority observed that GEPL did not select the equipment for their power plant and the EPC cost of the petitioner was not finalized. The petitioner was informed that pursuant to ECC's decision # ECC-65/5/2007 dated May 23 2007, the Authority was constrained to accept the EPC Cost which was not finalized. The Authority could only base its determinations on firm (non-reopenable) competitive price duly initialed / signed by the Independent Power Producer (IPP)/ EPC contractor. The petitioner was, accordingly, directed to submit firm/non-reopen-able EPC contract price for the determination of Generation Tariff. The case was pended till the provision of the requisite information.
- 4.2 Having finalized its EPC contract on June 7 2008 as per the requirement of the ECC decision the GEPL vide letter # GEL/ NEPRA / 18, dated June 10, 2008 submitted copies of the following documents:
- Contract Agreement for the Engineering, Procurement and Manufacture of Equipment with China National Machinery & Equipment Import and Export Corporation (CMEC);
 - Contract Agreement for the Construction and Provision of Certain Deliveries with China East Resource Import & Export Corporation (CERIEC); and
 - Coordination Agreement for the Engineering, Procurement and Construction of the Green Electric Project with CMEC and CERIEC.
- 4.3 According to the petitioner, the delay of about 10 months in the provision of information was due to the time required for finalizing the EPC price through international competitive bidding in a transparent manner. GEPL stated that for this purpose the services of Scott Wilson, Consultants of UK, were acquired for the preparation of Request for Proposals (RFP) documents and evaluation of bids. The petitioner submitted that the tender was published in the leading newspapers. According to the petitioner, although the ten companies purchased RFP documents only two Chinese firms (CMEC and CMC) submitted their bids; both bids, however, contained many deviations from the RFP documents. According to GEPL a lot of time was consumed in getting clarifications and the evaluation process was completed by November, 2007.



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- 4.4 The petitioner stated that being the lowest bidder, CMEC was invited for negotiations in Lahore in December 2007 but the firm could not bring its full team and confirmation from General Electric (GE) France regarding price and delivery period of the Gas Turbine for the Project. The petitioner further stated that it contacted GE to expedite submission of the bid. Subsequently, petitioner held many meetings with CMEC in Lahore and Beijing. According to the petitioner during these meetings, it observed that CMEC was somewhat reluctant to undertake the Project due to changed political atmosphere and uncertain security situation in Pakistan. In spite of these unfavorable conditions, the petitioner was able to manage competitive EPC price and the best possible terms for the Project.
- 4.5 Given the above situation the Authority is of the opinion that the delay of the EPC contract was beyond the control of the petitioner and has, therefore, decided to condone the delay of 10 months period.
5. **Net Plant Capacity & Tariff on HSD**
- 5.1 According to the petitioner on the basis of the selected equipment, its Plant capacity at generator terminals (ISO) would be 188 MW (on Gas) and 183 MW (on HSD). The petitioner submitted that its gross power output at design conditions is 177.36 MW on gas and 174.46 MW at HSD. The net out put is 170.00 MW on gas and 167.00 MW on HSD. The petitioner assumed auxiliary consumption of 7.367 MW and 7.465 MW on gas and HSD respectively.
- 5.2 CPPA vide letter # COO/CPPA/CE-II/7953-54 dated June 22, 2007 objected that Government of Pakistan (GOP) in its Letter of Intent (LOI) allowed GEPL to establish the 405 MW Combined Cycle Power Project which was to be implemented in two phases (205 MW in 1st phase and 200 MW in 2nd Phase) whereas the petitioner filed a tariff petition for the supply of electricity from only 191.5 MW capacity Phase -I.
- 5.3 CPPA through letter # GM (WPPO) CE-II /19219-20 dated September 13 2008 objected to the changed configuration/make from Siemens (3 + 1) to GE (1 + 1) machines that has resulted in decrease in gross capacity of 183.4 MW to 177.36 MW. CPPA also showed its concern on increasing the auxiliary consumption from 4.3 MW to 7.37 MW that resulted in further decrease in net output by 3.04 MW.
- 5.4 GEPL, while responding to CPPA comments vide letter # GEL/NEPRA/25 dated September 16 2008 stated that its original petition was based on the feasibility study according to which the preferred plant option was Siemens 3 gas turbines, SGT 800, with one steam turbine in a combined cycle configuration. According to GEPL, it received only



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two bids, in response to its invitation of EPC tenders through an open international competitive bidding process, and both the participating bidders offered GE gas turbine type PG 9171E in one gas turbine plus one steam turbine configuration. Therefore, GEPL was left with no choice but to accept the offered plant configuration. GEPL stated that the net capacity was based on the signed EPC agreement and was dependent upon the quality of gas which contains high volume of nitrogen which is about 21% against the requirement of less than 15% for the normal Gas Turbine (GT) operation.

5.5 Due to the aforementioned reasons, in GEPL's opinion, the comparison of net capacity with the Foundation Power Project is not appropriate. GEPL further stated that bids evaluation was carried out with the assistance of UK based consultants and the net capacity is subject to test at Commercial Operation Date (COD); therefore, the net capacity as specified in the EPC contract may be adopted for tariff calculation.

5.6 The scrutiny of the information revealed that the petitioner assumed 1.98 MW as transformer losses and 1 MW as auxiliary consumption for its housing colony. The petitioner was asked to justify the inclusion of 1 MW for the housing colony load in its auxiliary consumption. According to the details provided by the petitioner only 0.4 MW load pertaining to tube-wells for Raw Water Supply installed near River Indus at a distance of about 13 kMs from site, 100 kW for project lighting and 100 kW for workshops community could be justified. The transformer losses assumed by the petitioner are about 1.1% of the net output, which according to the GTW Handbook 2008 should be around 0.5%. Since the tube-well load at river is subject to completion of that scheme therefore is not considered at this point of time. The actual load subject to maximum of 0.4 MW at the time of COD on this account will be assessed and adjustment will be allowed accordingly. After incorporating the proposed adjustments, the auxiliary consumption of 5.526 MW (without tube-well load of 0.4 MW at river) on gas has been worked out as against requested 7.37 MW. After making the aforementioned adjustments in the auxiliary load, the net capacity on gas at site works out as 171.841 MW, which is being adopted for tariff calculations. The design conditions (reference conditions) for Performance Guarantee Test are as follows:

Ambient Temperature	28 °C
Atmospheric Pressure	1.013 bar
Relative humidity	50%
Net Heat Rate (LHV) - Gas	7,113 Btu/kWh

5.7 In order to establish more realistic numbers of net capacity and heat rates, the Authority considers that heat rate and Initial Dependable Capacity (IDC) tests should be carried out



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at COD. The net capacity of 171.841 MW and minimum net efficiency (LHV) of 47.98% in the case of operation on gas has been used for tariff calculation. The net capacity will be adjusted at the time of COD based upon the abovementioned tests. In case the net output and net efficiency as a result of tests is established higher than the minimum net output of 171.841 MW (171.441 MW plus requirement for tube-well load at river site subject to maximum of 0.4 MW) and minimum net efficiency (LHV) of 47.98% than the relevant tariff components shall be adjusted accordingly. There will be no adjustment in case the net output and net efficiency as a result of tests are established less than the aforementioned allowed output and heat rates.

- 5.8 CPPA opposed the petitioner's request for allowing tariff on High Speed Diesel (HSD) in case of gas supply interruption. The Power Purchaser was of the view that tariff should be allowed based on single fuel i.e. low Btu gas. In response the petitioner stated that the backup fuel was essentially required to ensure availability and operation of the plant during interruption of gas for any reason, to meet the needs of the power system and was in line with the international practice and being a mandatory requirement of the lenders.
- 5.9 The Authority in the cases of comparable projects did not allow separate tariff on back up fuel on the ground that the projects were allocated firm gas quota. Since, in the instant case, gas has been allocated from a dedicated field, therefore, the Authority decided not to allow separate Tariff on HSD for the time being. However, the Authority will decide in the matter of allowing tariff on HSD when the status of gas availability is exactly known.

6. Project Cost

6.1 EPC Cost

- 6.1.1 At the time of submitting the petition nothing was finalized in terms of EPC costs and the scope of EPC contractor. Having finalized the EPC contract, GEPL submitted the signed copies of EPC contract and its scope vide letter # GEL/NEPRA/18 dated June 10, 2008 and letter # GEL / NEPRA /19 dated July 7, 2008. GEPL provided the following breakup of EPC cost:

	Euro Portion	US\$ Portion
• E&P Contract	25,685,000	105,000,000
• Construction Contract		17,632,757
Total	25,685,000	122,632,757
Total in Equivalent US\$		162,582,520

(Exchange rate as on 31st May 2008:1 Euro = 1.5553 US\$)



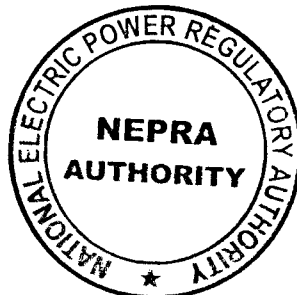
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- 6.1.2 GEPL signed the Engineering and Procurement (E&P) contract with China Machinery & Equipment Import & Export Corporation (CMEC), according to which the petitioner would pay to the contractor Euro 25.68 million and US\$ 105 million for the design , engineering , manufacture and supply of equipment, erection, commissioning and construction for the project.
- 6.1.3 According to the terms of the contract, the dollar portion of US\$ 122.63 million (US\$105 million for equipment and US\$ 17.63 million for construction) is meant to cover the cost of Heat Recovery Steam Generator, Steam Turbine, Control & Instrumentation System, Electrical System, Balance of Plant, Water Supply System and its Treatment (within the boundary of Plant), Interfaces with Fuel Supply System, Access Road up-gradation, Civil works including Residential Colony , Piles & Foundation, Engineering, Management, Erection, testing and commissioning , Black Start facility and By pass stations.
- 6.1.4 CPPA objected on providing cost of US\$ 4.99 million for the Bypass Stack. According to CPPA since the plant was planned to be operated in Combined Cycle mode; therefore, Bypass Stack was not required. In response, GEPL explained that the main purpose of the Bypass Stack was to allow the Gas Turbine (GT) to run in simple cycle mode so that electrical energy could be generated during the construction period to cater for the national load requirement and subsequently, during operational period, whenever the Heat Recovery Steam Generator (HRSG) or Steam Turbine (ST) would be out of operation for maintenance or due to forced shutdowns. GEPL stated that if in the opinion of the Power Purchaser open cycle operation facility was not required, then this cost might be excluded.
- 6.1.5 Having considered the arguments of the CPPA and the petitioner, the Authority considers that provision of Bypass Station would provide flexibility in plant operation; therefore decided to accept the petitioner's request and is of the opinion that the EPC cost requested by the petitioner is reasonable and also comparable with the EPC cost allowed in other similar projects. Therefore, the Authority has decided to allow US\$ 155.352 million (Euro Dollar Parity of 1.2739) for net capacity of 171.841 in this context.

7. **Non-EPC Cost**

GEPL stated that the costs on the following items are not within the scope of EPC contractor and are requested to be allowed separately:

- | | |
|-----------------------------------|--------------------|
| i). Desalination Plant | US\$ 2.432 million |
| ii). Water Supply System | US\$ 4.000 million |
| iii). Waste Water Disposal System | US\$ 1.920 million |



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7.1 Desalination Plant

7.1.1 GEPL requested to allow a cost of US\$ 2.43 for Desalination Plant. While justifying the provision of this cost the petitioner stated that the quality of the underground water within the project area was very saline. GEPL further stated that the area was located at the tail end of Dadu canal and has a limited charging source. According to the petitioner the project site entails additional cost due to uncertainty and saline nature of underground water, where the conductivity of the underground water ranges from 1000-3000 $\mu\text{s}/\text{cm}$; as such, a Desalination Plant was required to reduce the salt and hardness contents in the water before using it for de-mineralizing plant and for make-up in the cooling tower.

7.1.2 The petitioner although provided quotation in support of its claim but the cost indicated in the quotation was on the higher side as compared to the documentary evidence available in other IPPs. Based on the available information, the Authority assessed US\$ 1.5 million on account of desalination plant.

7.2 Water Supply System

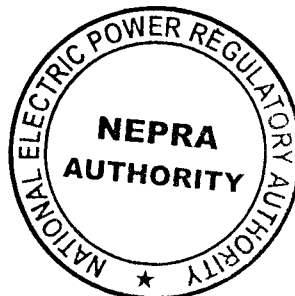
7.2.1 The petitioner stated that as per the EPC contract the Owner is required to provide the fresh water with the quality ($\text{SS} \leq 10\text{mg}/\text{l}$, $\text{pH} = 6.5-9$) up to 1 meter outside plant. According to the petitioner, it was not sure whether the quality of underground water would not further deteriorate over time; therefore, an alternative arrangement for water supply was essentially required. The petitioner further stated that considering sustainability of water supply for the project life of 30 years, it was also planned to pump underground water from a site near river Indus, where the water quality was relatively better. The distance of the proposed pumping site is about 13 kms from the project site. 6 tube-wells of 1 Cusec capacity will have to be installed at this site. The petitioner provided the following working to substantiate its claimed cost of US\$ 4 million;

a) Water Supply from Site

- | | |
|---|---|
| ➤ Cost of 12 tube wells @ Rs.2.0 million | Rs.24.0 Million |
| ➤ Cost of gathering pipeline, 12 inches in diameter and 2 kms Long @ Rs.5000 per foot. (including cost of pipeline, coating/ wrapping, laying and right of way) | Rs.33.0 Million |
| Total: | Rs.57.0 Million
US\$ 0.857 Million |

b) Cost of Water Supply from the site near river Indus

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|---|-----------------|
| ➤ Cost of 6 tube-wells @ Rs.2.0 million | Rs.12.0 Million |
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<p>➤ Cost of gathering pipeline, 12 inches in diameter and 1 km Long @ Rs.5000 per foot (including cost of pipeline, coating/wrapping, laying and right of way)</p>	Rs.16.5 Million
<p>➤ Cost of pipeline up to project site, 12 inches in diameter and 13 kms long @ Rs. 5000 per foot. (Including cost of pipeline, coating/wrapping, laying and right of way)</p>	Rs.214.5 Million
Total	Rs.243.0 Million
	US\$ 3.654 Million
Total Cost of Water Supply System	Rs.300.0 Million
	US\$ 4.51 Million

7.2.2 According to the petitioner, CMEC China, the EPC Contractor for the Project, provided preliminary budgetary price for Water Supply from the site near river Indus, as US\$ 3.075 million, without any provision for the cost of right of way. The petitioner has estimated the cost of right of way US\$ 0.857 million. If the cost of right of way is added to CMEC price, the total cost of Water Supply System works out as US\$ 3.932 million.

7.2.3 The Authority considers that the number of twelve tube-wells as proposed by the petitioner's is on the higher side. In Authority's opinion in order to meet the water requirement of the project eight tube-wells would be sufficient for discharge of three cusecs. The Authority has therefore assessed cost of tube-wells as US\$ 0.6 million as against requested US\$ 0.857 million. The Authority further considers that the cost of land for right of way for laying pipeline is extra-ordinarily high. In Authority's opinion US\$ 2.5 million would be a fair assessment of cost of right of way for laying pipeline.

7.2.4 In view of above the overall cost on account of water supply system is assessed as US\$ 3.1 million and the same is being allowed as against US\$ 4 million requested by the petitioner.

7.3 Waste Water Disposal System

7.3.1 GEPL stated that, due to high salinity content in water, excessive blow down from the cooling tower will be required. However, due to environmental constraints this water cannot be discharged to the canal or nearby agriculture land. According to GEPL, this waste water can be discharged to Chandan Wah drain located at a distance of about 6-8 kilometers after ensuring that the temperature rise and other contents meet the environmental requirements. The cost for the waste water disposal is estimated at US\$ 1.92 million. GEPL has provided following working to substantiate its claim:



➤ Cost of 2 Acres of Land outside project site for maintaining Evaporating Pond @ Rs. 2.5 million per Acre	5.0 Million Rs.
➤ Cost for development of Evaporating Pound	5.0 Million Rs.
➤ Cost of pipeline from project site to Chandan Wah drain, 12 inches in diameter and 8 kms long @ Rs.4000 per foot. (Including cost of pipeline, coating/wrapping, laying and right of way)	105.5 Million Rs.
Total Cost	115.5 Million Rs. =1.92 US\$ at the exchange rate of 1 US\$ = Rs.60

7.3.2 The Authority considers that the above cost estimates have not been substantiated with proper evidence. Therefore, in order to assess the reasonability of the cost estimates, the Authority had to rely on the information available in other similar cases. Based on the documentary evidence available in other cases, the Authority, in the instant case, has assessed US\$ 0.8 million as cost of waste water disposal system.

8. Project Development Costs

8.1 GEPL requested US\$ 2.5 million to cover its costs regarding feasibility studies & other consultancies, cost of land including brokerage and stamp duty, fencing with barbed wire and RCC foundation, earth filing for fencing, fencing lighting with diesel generating Set, tube-well at site, guard rooms and ammunition and drinking water pipe line during construction period.

8.2 Since the cost of US\$ 0.35 million for other Consulting Services was not supported with any evidence it is, therefore, not being allowed. Considering all other costs as reasonable and using Exchange Rate of Rs. 79.49/USD, the Authority has assessed US\$ 1.785 million on account of project development costs.

9. Project Company Cost

9.1 Construction Management

9.1.1 The petitioner requested US\$ 2.5 million for the following construction management costs;
PPIB processing fee



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NEPRA petition and license fee
Company public listing
Company vehicle expenses
Office equipment / IT equipment / Furniture and fittings etc
Sponsors Karachi office expenses
Traveling / Boarding of Executives
Bank Guarantees for PPIB
Miscellaneous

9.1.2 The Authority compared the above requested costs with the other projects. The Authority observed that almost all the requested costs, except company vehicle expenses and miscellaneous, were reasonable. The petitioner has not provided any evidence or workings to justify miscellaneous expenses. Similarly the cost of company vehicles of US\$ 0.8 million is considered higher as compared to other similar projects and, therefore, is being rationalized. Accordingly US\$ 0.5 million as cost of company vehicles is allowed. Based on the aforementioned necessary adjustments, overall cost of US\$ 1.9 million has been allowed under this head.

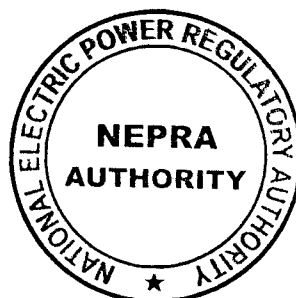
9.2 Fees, Permits and Legal Expenses

9.2.1 The petitioner requested to allow US\$ 1.5 million on account of Fess for Legal Consultant, Insurance Advisor/Bank, Commercial, Financial and Legal Consultant, Technical consultant / Bank and Miscellaneous.

9.2.2 Having examined all the individual cost items claimed by the petitioner, the Authority observed that all the expenses, except cost of legal consultant and miscellaneous, claimed under this head pertain to financing arrangements and are, therefore, being considered under the relevant head of financial fees and charges. The miscellaneous expenses of US\$ 0.3 million, being not supported with evidence, are being disallowed. The requested cost of US\$ 0.4 million for the legal consultant is comparable with other similar projects; therefore, it is being allowed as such.

9.3 Utilities during Construction

GEPL has made a provision of US\$ 0.30 million to cover the cost of electricity, telephone, water supply and internet etc. during construction period which, according to the petitioner translates to a monthly average of Rs. 600,000. The provision is comparable with that allowed in other similar cases and is, hence, being accepted as such.



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9.4 Un-Recovered Fuel Cost during Testing and Commissioning & Pre - COD Operation and Maintenance (O&M) Costs

- 9.4.1 GEPL initially requested US\$ 0.7 million on account of Un- recovered fuel cost during testing and commissioning, which was subsequently revised to US\$ 0.25 million vide letter # GEL/NEPRA/19 dated July 7, 2008. The Authority considers that the revised cost requested by the petitioner is reasonable as compared to the cost allowed in other similar cases and has, therefore, decided to allow as such.
- 9.4.2 GEPL also requested for allowing O&M mobilization cost of US\$ 0.6 million. GEPL stated that according to the terms of the contract these costs were essentially required and were the responsibility of the petitioner. The petitioner however did not substantiate its claim with documentary evidence, therefore, the Authority has decided to disallowed this cost.
- 9.4.3 The petitioner also requested US\$ 0.9 million as O&M Contractor's pre-commissioning mobilization fee. The Authority considers that the petitioner's request is although in line with the Authority's earlier decision but is on the higher side therefore needs to be adjusted. In Authority's opinion US\$ 0.6 million as O&M Contractor's Pre-Commissioning Mobilization fee is a fair assessment.

9.5 Owner & Independent Engineer

The petitioner has requested a cost of US\$ 1.5 million and US\$ 0.25 million under the account of Owner's Engineer and Independent Engineer respectively. The Authority considers that the cost requested by the petitioner is on the higher side as compared to other projects. Furthermore, the petitioner has not substantiated the cost with proper evidence. In the absence of any such evidence, the petitioner's request is being rationalized. Accordingly, the Authority has assessed US\$ 0.75 as cost of Owner and Independent Engineer.

10. Pre-COD Insurance Cost

GEPL requested US\$ 1.96 million as insurance cost during construction calculated at 1.35% insurance rate, in addition to construction contract cost of US\$ 17.633 million. Later, the petitioner vide letter # GEL/NEPRA/19 dated July 7 2008 revised the requested amount to US\$ 2.0 million, stating therein that the calculation was done at a 1% premium rate of the total project cost. This cost is subject to adjustment on actual basis up to maximum of 1.35% of EPC at COD on the basis of documentary evidence. Therefore, the Authority has decided to allow the same.



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11. Custom Duties and Withholding Tax

The petitioner estimated US\$ 6.549 million as Custom Duties. The GEPL's calculation has been based on 5% of the EPC cost (excluding GE's scope of EPC). Withholding Tax has been estimated around US\$ 2.60 million (calculation based on 6%). Duties and taxes are pass-through, which would be adjusted at COD as per actual based on the documentary evidence. Therefore, these are being allowed as such.

12. Financing Fees and Charges

12.1 GEPL estimated a financing fee of US\$ 2.58 million by assuming total debt at US\$ 172.4 million with 70% financing in foreign currency and 30% in local currency. The financing fee comprises arrangement fee, lending fee, legal expenses etc which are estimated @ 2% for foreign currency component and 1% for local currency component. In addition commitment fee is included @ 0.05% of the balance loan.

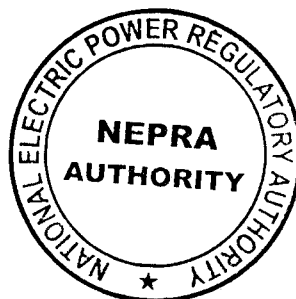
12.2 Based upon the revised Capital Expenditure (CAPEX) of US\$177.887 million, the Authority has assessed a financing fee of US\$ 2.415 million against US\$ 2.58 million requested by the petitioner. The petitioner also requested consultants' and advisory fee of US\$ 1.0 million under the head of fees, permits and legal expenses, which being related to financing arrangement, were not considered under that head. This cost being comparable with the cost allowed in other similar projects was found to be reasonable and is, therefore, being allowed in addition to assessed financing fees of US\$ 2.415 million. The Authority has, thus, assessed overall financing fees and charges as US\$ 3.415 subject to adjustment on actual basis at COD, up to maximum of 3% of the borrowing.

13. Interest During Construction (IDC)

13.1 GEPL requested an amount of US\$ 22.09 million as interest during construction on the basis of proposed disbursement of CAPEX of US\$ 192.384 million. The petitioner calculated Interest during construction based on the the capital expenditure spread over 28 months of construction period as indicated below:

	Year1	Year 2	Year 3
Debt	15%	40%	45%

13.2 Based on the assessed CAPEX of US\$177.887 million and proposed disbursement plan, the IDC in the instant case works out as US\$ 12.704 million, which will be adjusted at the time of COD as per the actual loan disbursement.



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14. CAPACITY CHARGE

14.1 Fixed O&M Costs

- 14.1.1 The petitioner requested US\$ 3.10 million (including US\$ 0.8 million on account of contingencies) per annum or Rs.0.1391/kW/hr as fixed O&M costs for its operations on Gas based on exchange of Rs. 66.5 per US\$. According to the petitioner 35% or Rs.0.048 /kW/hr of its fixed O&M would be local and the remaining 65% or Rs.0.090 /kW/hr would be foreign. The petitioner stated that its fixed O&M cost in terms of per kW per hr would increase due to lower net capacity for operations on HSD which would be 168.70 MW, as compared to 171.69 MW for operations on Gas; thus for operation on HSD GEPL has requested Rs.0.05 /kW/hr local and Rs.0.090 /kW/hr foreign.
- 14.1.2 According to the petitioner it has not finalized its O&M contract and its request for allowing fixed O&M cost of US\$ 3.10 million including US\$ 0.8 million on account of contingencies is based on estimates. In the absence of such documentary evidence the Authority was constrained to rely upon the decisions made in other similar cases in order to make a fair assessment of fixed O&M cost. As regards the provision of US\$ 0.8 million on account of contingencies, the Authority as a policy did not allow any provision on this account in other IPPs because almost all the costs are subject to adjustment with different indexations therefore in the instant case the contingencies are not considered. The Authority also observed that the petitioner's estimates are about more than one year old and, therefore, needed to be updated for realistic comparison with other similar projects. According to the information provided by the petitioner its reference WPI and US CPI for the month of August 2006 were 119.88 and 203.9 respectively. The petitioner used as reference exchange rate of 66.5 Rs/US\$. On the basis of information provided by the petitioner the relevant cost components have been adjusted with the current US CPI of 219.96 and WPI of 139.37 (for the month of July 2008) and exchange rate of Rs.79.49/US\$. After making adjustments for the aforementioned factors, the updated fixed O&M cost, in the instant case, works out to be US\$ 3.12 million, which is considered reasonable and is being allowed.
- 14.1.3 Based on the allowed fixed O&M cost of US\$ 3.12 million (Local US\$ 1.34 million and Foreign US\$ 1.78 million) and net capacity of 171.841 MW on gas, the Authority has assessed fixed O&M local component of Rs. 0.0706/kW/hr and foreign component of Rs.0.0940/kW/hr.

14.2 Insurance

The petitioner has requested insurance @ 1.35% of EPC cost. The Authority considers that the exact amount payable by petitioner on account of insurance cost cannot be established



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at this point of time therefore for the purpose of calculation of tariff; the insurance cost requested by the petitioner is accepted by the Authority subject to adjustment at the time of COD up to maximum of 1.35% of EPC price based upon the documentary evidence provided by the petitioner. Based upon the adjusted EPC, the Authority has assessed Rs. 0.11 per kW per hour as cost of insurance for its operations on Gas.

14.3 Cost of Working Capital

- 14.3.1 The petitioner requested financing cost of working capital to the tune of US\$ 0.58 million based on loan facility of US\$ 4.60 million for maintaining inventory level of HSD, equivalent to 7 days plant operation at full load during unforeseen gas interruptions. According to the petitioner this will be retained throughout the terms of the Power Purchase Agreement (PPA). The interest rate used is 3 months KIBOR (10.63% + 2%). GEPL has also requested to recalculate working capital requirements at the prevailing rates of HSD and indexing it for any increase in fuel prices and variations in the interest rates. For calculating its working capital component, the petitioner used the net capacity on gas operations. The petitioner also requested the same component for its operations on HSD.
- 14.3.2 Since the Authority has not considered the petitioner's request for allowing separate tariff on HSD in the event of gas interruptions, therefore, the request for allowing cost of working capital for financing HSD inventory cannot be considered at this point of time. However, in case the Authority decides to allow tariff on HSD at lateral stage in case of gas interruptions, the cost of working capital for financing HSD inventory will also be considered accordingly.

14.4 Return on Equity (ROE)

- 14.4.1 The petitioner requested Rs. 0.2901/ kW/hour as Return on Equity of US\$ 43.40 million to achieve a net 15% Internal Rate of Return (IRR) for operations on gas. For operations on HSD, the same component has been requested as Rs. 0.2954 /kW/hr on the basis of net capacity of 168.704 MW.
- 14.4.2 Subsequent to the adjustment in EPC cost (Euro portion) due to change in Euro/US\$ parity and rationalization of Non-EPC costs, the petitioner's project cost has been revised. The overall project cost accordingly has been assessed as US\$ 194.006 million as against US\$ 217.01 million requested by the petitioner. Due to revision in the project cost the equity amount has also changed to US\$ 38.801 million. Based upon the revised equity of GEPL, ROE works out to be Rs. 0.3073/kW/hour for its operations on gas.



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14.5 Return on Equity During Construction (ROE DC)

In order to ensure a 15% IRR, return on equity during construction (ROEDC), in the instant case, has been worked out as Rs. 0.0493/kW/hr for its operations on gas. This would be subject to adjustment at the time of COD on account of actual drawdown of equity.

14.6 Withholding Tax

The petitioner submitted that Withholding tax on dividends (currently at 7.5%) as required to be deducted under the Income Tax Ordinance, 2001 or any other law for the time being in force at the time of such payment is considered as pass-through. The petitioner requested Rs. 0.03/kW/hr for its operations on gas. Based on the revised equity, the amount of withholding tax in the instant case has been assessed as Rs. 0.0267/kW/hr for GEPL's operations on gas.

14.7 Debt Servicing

14.7.1 GEPL has based its project financing on a Debt/Equity ratio of 80:20. The local foreign debt composition in the total project cost will be 25% and 55% respectively.

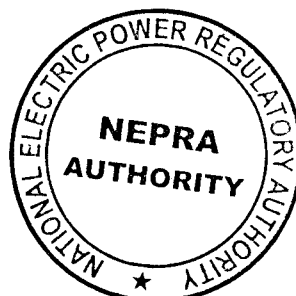
14.7.2 In the instant case the overall debt amount has been worked out to be US\$ 155.205 million. The debt servicing of the GEPL Assuming interest rate of 13.63% (3 – month KIBOR i.e. 10.63% + 300 basis points) and 8.36% (3- months LIBOR i.e 5.36% + 300 basis points) the debt service component of Rs. 0.4729/kW/hr and Rs. 0.8370/kW/hr has been assessed for GEPL's operations on gas for local and foreign components respectively, subject to adjustment for variation in KIBOR and LIBOR on quarterly basis according to the following formula;

$$\Delta I(\text{local debt}) = P_{(\text{REV})} * (\text{KIBOR}_{(\text{REV})} - 10.63\%) / 4$$

$$\Delta I(\text{foreign debt}) = P_{(\text{REV})} * (\text{LIBOR}_{(\text{REV})} - 5.36\%) / 4$$

Where:

$\Delta I(\text{local debt})$ = the variation in interest charges applicable corresponding to variation in quarterly KIBOR. ΔI can be positive or negative depending upon whether $\text{KIBOR}_{(\text{REV})} >$ or $<$ 10.63%. The interest payment obligation will be enhanced or reduced to the extent of ΔI for each quarter under adjustment applicable on quarterly basis.



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$\Delta I_{(\text{foreign debt})}$ = the variation in interest charges applicable corresponding to variation in quarterly LIBOR. ΔI can be positive or negative depending upon whether LIBOR_(REV) > or < 5.36%. The interest payment obligation will be enhanced or reduced to the extent of ΔI for each quarter under adjustment applicable on quarterly basis.

$P_{(\text{REV})}$ = is the outstanding principal (as indicated in the attached debt service schedule to this order) on a quarterly basis on the relevant quarterly calculations date. Period 1 shall commence on the date on which the 1st installment is due after availing the grace period.

15. ENERGY CHARGE

15.1 Fuel Cost (Gas)

15.1.1 The petitioner has requested fuel cost of Rs. 2.0026/kWh based on low BTU Zamzama Gas Field. The calculation has been based on the following reference parameters:

Plant Factor	100%
Net Plant Heat Rate (BTU/kWh)	7,188
Reference HHV Gas Price (MMBTU/kWh)	251.55
HHV-LHV Factor	1.10761
Reference LHV Gas Price (MMBT/kWh)	278.62
Fuel Price (PKR/kWh)	2.0026

15.1.2 The proposed thermal efficiency in the instant case is 47.48% which is less by 1.36% as compared to 48.84% in the case of FPCDL (a project of comparable capacity). CPPA, in its latest comments, stated that the petitioner's requested thermal efficiency and heat rate was significantly lower than the Foundation Power (Dharki) Ltd. which was also a similar project having the same configuration, technology and make/model. CPPA suggested that GEPL may be advised to improve the heat rate and match the specification figures of Foundation Power Company. While responding to CPPA's comments, the petitioner stated that the specific features of its project need to be considered and evaluated when compared with other projects. GEPL further stated that though heating value of Zamzama gas allocated for its project is better than that of Gas yet it contains high volume of Nitrogen i.e. about 21% against the requirement of less than 15% for the normal Gas Turbine Operation. According to GEPL, the higher content of Nitrogen in gas fuel causes flame instability as well as higher NO_x emissions which require water injection in the combustion chamber for NO_x control. This results in an increase in plant heat rate and higher maintenance requirement. The petitioner in support of its working has submitted relevant data provided by the EPC contractor.



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15.1.3 According to the information provided by the petitioner the guaranteed net heat rate (on LHV) at gas would be 7137 Btu/kWh. Based on the net thermal efficiency of 47.98% net heat rate (on LHV) at gas works out as 7113 Btu/kWh as against 7137 Btu/kWh. In order to validate the data provided by the EPC contractor the services of the consultant would be required, which can take much time that may result in delaying the project. In case efficiency is established higher than the efficiency of 47.98% in the heat rate test at COD, the fuel cost component shall be adjusted accordingly.

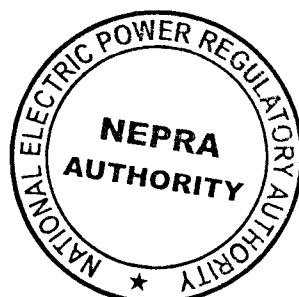
15.1.4 Based upon the reference parameters and taking the latest gas prices notified by Oil and Gas Regulatory Authority (OGRA), the fuel cost component, in the instant case, has been worked out to be Rs. 1.9818 per kWh.

15.2 VARIABLE O&M COSTS

15.2.1 The petitioner in the latest information has increased variable O&M cost from Rs. 0.19/kWh as requested in the petition to Rs. 0.27/kWh. The CPPA objected to the petitioner's request for increasing variable O&M cost. According to the CPPA the requested O&M cost is much higher as compared to Rs. 0.21/kWh allowed to FPCDL. The CPPA also objected to the calculation of variable O&M based on 60% plant factor and suggested that it should be based on 100% plant factor.

15.2.2 The Authority observed that the petitioner's request for allowing the variable cost of US\$ 3 million per annum or Rs.0.22/kWh, comprising US\$ 2.40 million (Rs.0.1767/kWh) as foreign and US\$ 0.6 million (Rs.0.0442/kWh) as local portion was not supported with documentary evidence. In the absence of any documentary evidence, in the instant case, the requested cost has been compared with the costs allowed in other similar cases in order to assess the reasonability of the petitioner's request. Based on the available information, the Authority has decided to allow the same variable O&M (adjusted) as in the cases of other comparable projects i.e. Rs.0.2236/kWh comprising Rs.0.1906/kWh as foreign and Rs.0.0330/kWh as local component.

15.2.3 According to the petitioner, the quality of underground water at project site is very poor and would have to be treated before usage. For the treatment of water it will have to incur additional operating cost of Desalination Plant of US\$ 0.62 million or Rs. 0.0454/kWh. The petitioner's working is not based on documentary evidence, therefore, cannot be accepted as such. However, in order to make fair assessment of this cost, the information available in one other case was relied upon. The Authority on the basis of the available information decided to allow Rs.0.0270/kWh on account of water treatment.



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16. **Timeline of the Project**

GEPL requested the Authority to allow it to attain its COD after 28 months from the date of its financial close. The petitioner’s request, being reasonable, is being accepted.

17. **Indexation**

17.1 The petitioner requested that the Tariff be indexed:

- (a) in accordance with the existing policies of the GOP; and
- (b) in accordance with corresponding benefits and terms that have been made available by NEPRA to other IPPs, thereafter, on a non-discriminatory basis.

17.2 The Company submitted that the basis for such indexations should be as follows:

<u>Capacity Charge</u>	<u>Application Indexation</u>
Fixed O&M Foreign	US\$/PKR Parity & US CPI
Fixed O&M Local	WPI (Manufactures)
Cost of Working Capital	KIBOR plus changes in Gas Prices
Insurance	US\$/PKR Parity & US CPI
Debt Service	KIBOR & LIBOR
ROE	US\$/PKR Parity
ROEDC	US\$/PKR Parity
 <u>Energy Charge</u>	
Fuel Cost	Gas Price
Variable O&M Foreign	US\$/PKR Parity & US CPI

17.3 All the above mentioned indexations, except US CPI on insurance cost component and change in gas prices on cost of working capital, are already allowed by the Authority.

18. **GENERAL ASSUMPTIONS**

18.1 Having considered all the assumptions the Authority is of the opinion that while making the above assessment, all the relevant assumptions have been taken into account. However there are certain assumptions like i) provision of Debt Services Reserve Account (DSRA), Maintenance Reserve Account or Contingency Reserve Account or any other Reserve Account ii) provision of carrying cost due to changes in the fuel supply patterns iii) Any additional indexation or concession allowed by the GOP, NEPRA or another Government functionary to any IPP, allowing Zakat deduction on dividends (currently at 2.5%) as required under Zakat Ordinance as pass-through item, which were although considered by



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the Authority in the cases of other IPPs but were not allowed to any IPP. In view of the aforementioned and on the basis of principle of justice and equity the Authority has decided not to allow the same in the instant case.

18.2 The Authority considers that the following assumptions being the subject of PPA should be dealt with therein;

- If there is any gas supply interruption during the term of the PPA and the plant is dispatched on HSD, the Power Purchaser will compensate the petitioner accordingly.
- In case the plant is dispatched on HSD for longer period (more than 7 days in a year), the efficiency degradation/adjustment being different on HSD will be allowed in accordance with the recommendations of the manufacturer. Similarly, additional cost for gas turbine start-up, shutdown as well as part-load operation with HSD shall be compensated by factors based on the data from the gas turbine manufacturer.
- The number of Cold, Warm and Hot Start-ups of the Units/Plant will be considered as per manufacturer's recommendations and prudent utility practices and 40 free unit starts and 20 complete complex starts each year without any spill-over are assumed. The cost of additional starts-ups in any year shall be pass-through to the Power Purchaser.

18.3 The Authority considers that the petitioner's request for allowing adjustment for Hedging cost during construction on account of foreign currency payment to EPC contractor at COD and cost of additional Working Capital for bridge financing for gap between payment to Fuel supplier and receipt from Power Purchaser is justified and will be considered at COD on production of documentary evidence.

19. Summary of the Decisions

19.1 The generation tariff has been assessed on the basis of following;

Plant Capacity (Gross ISO)	188 MW on Gas
Plant Capacity (Net at reference site conditions)	171.841 MW on Gas
Plant Availability	90%
EPC Price Offshore	US\$ 105 million & Euro 25.685 million (Equivalent of US\$ 137.719 million)



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EPC Price	Onshore	US\$ 17.633 million
Costs not included in EPC's Scope		US\$ 5.400 million
Project Development Costs		US\$ 1.785 million
Project Company's Cost		US\$ 4.200 million
Insurance During Construction		US\$ 2.000 million
Custom Duties		US\$ 6.549 million
Withholding Tax on local services		US\$ 2.600 million
Financing Fees & Charges		US\$ 3.415 million
Interest During Construction		US\$ 12.704 million
Total Project Cost		US\$ 194.006 million
Debt (Foreign)		US\$ 106.704 million
Debt (Local)		US\$ 48.502 million
Equity		US\$ 38.801 million
Reference PKR/US\$ exchange rate		1US\$ =Rs.79.49
Reference PKR/Euro exchange rate		1Euro=Rs.101.26
Net Plant Heat Rate (BTU/kWh)		7,113(on Gas)
Reference HHV Gas Price (MMBT/kWh)		251.55
Reference LHV Gas Price (MMBT/kWh)		278.60
HHV-LHV Factor		1.107553
Reference Thermal Efficiency		47.98% (on Gas)
Reference KIBOR (3-monthly)		10.63%
Reference LIBOR (3-monthly)		5.36%
IRR		15%

19.2 In view of the above the Authority hereby approves the tariff of Green Electric Power Company Limited (GEPL) as set out in the following order;

ORDER

Pursuant to Rule 6 of the NEPRA Licensing (Generation) Rules 2000 Green Electric Power Company Limited (GEPL) is allowed to charge, subject to adjustment of Capacity Purchase Price on account of net dependable capacity and net thermal efficiency as determined by test jointly carried out by the Central Power Purchasing Agency (CPPA) and the petitioner, the following is approved as specified tariff for GEPL for delivery of electricity to the CPPA of the National Transmission and Dispatch Company (NTDC) for procurement on behalf of Ex-WAPDA Distribution Companies:



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REFERENCE SPECIFIED TARIFF

Tariff Components	Year 1 to 10	Year 11 to 30	Indexation
Capacity Charge PKR/kW/Hour)			
O&M Foreign	0.0940	0.0940	US\$ /PKR & US CPI
O&M Local	0.0706	0.0706	WPI
Insurance	0.1107	0.1107	US\$ /PKR
Debt Service	1.3098	-	LIBOR/KIBOR
Return on Equity	0.3073	0.3073	US\$ /PKR
ROE during Construction	0.0493	0.0493	US\$ /PKR
Total Capacity Charge	1.9418	0.6319	
Energy Charge on Operation on Gas Rs./kWh			
Fuel Cost Component	1.9818	1.9818	Fuel Price
Variable O&M – Local	0.0330	0.0330	WPI
Foreign	0.1906	0.1906	US\$ /PKR & US CPI
Water Desalination	0.0270	0.0270	WPI

Note:

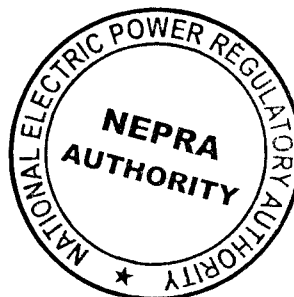
- i) Component wise tariff is indicated at Annex-I
- ii) Debt Servicing Schedule is attached as Annex-II

The following adjustments /indexations shall be applicable to reference tariff;

I. One Time Adjustments

I.(i) Adjustment in EPC Cost

The Authority has assessed EPC cost as US\$ 155.352 million out of which US\$ 105 million and Euro 25.685 million is offshore (equivalent to US\$ 137.719 million) and US\$ 17.633 million as onshore to be incurred in Pak Rupees. Since the exact timing of payment to EPC contractor is not known at this point of time, therefore, an adjustment for foreign currency fluctuation for the portion paid in the relevant foreign currency will be made. In this regard, the sponsor will be required to provide all the necessary relevant details along with documentary evidence. Based upon such information the relevant currency of EPC cost components shall be established and applied to the corresponding EPC cost components. The relevant tariff components i.e. Insurance, ROE, ROEDC, Principal Repayment and



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Interest Charges shall be adjusted only for currency fluctuation against the reference parity values.

I.(ii) Adjustment due to Variation in Net Capacity

The reference tariff has been determined on the basis of minimum net capacity of 171.841 MW at delivery point, at following reference site conditions;

Ambient Temperature	28 °C
Atmospheric Pressure	1.013 bar
Relative humidity	50%

All the relevant tariff components shall be adjusted at the time of COD based upon the Initial Dependable Capacity (IDC) to be carried out for determination of contracted capacity. Adjustment shall not be made if IDC is established at less than the net capacity of 171.841 MW at reference site conditions. The adjustments shall be made according to the following formula:

$$CC_{(Adj.)} = CC_{(Ref)} \times 171.841 MW / NC_{(IDC)}$$

Note: Above formula shall be applicable to all the individual relevant components of Capacity Charges.

Where;

$CC_{(Adj)}$	= Adjusted relevant Capacity Charge components of tariff
$CC_{(Ref)}$	= Reference relevant Capacity Charge components of tariff
$NC_{(IDC)}$	= Net Capacity at reference site conditions established at the time of IDC test

Note:- Reference capacity charge components of Tariff i.e. Revised O&M Foreign, Revised O&M Local, Insurance, Debt Servicing, Return on Equity and ROEDC to be adjusted as per IDC test.

I.(iii) Adjustment due to variation in Net Efficiency

The reference tariff has been determined on the basis of minimum net efficiency of 47.98%. Based upon the heat rate test of the complex to be carried out jointly by the CPPA and the Petitioner at the time of COD, the reference fuel cost component of tariff shall be adjusted in case the net efficiency is established at higher than 47.98%. The adjustment shall be made according to the following formula;

$$FC_{(Adj)} = Rs. 1.9818 \text{ per kWh} / 7,113 \times HR_{(T)}$$



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Where;

$FC_{(Adj)}$ = Adjusted fuel cost component at the time of heat rate test at COD

$HR_{(T)}$ = Net Efficiency in Btu per kWh established after Heat Rate Test at the time of COD

I.(iv) Adjustment Based on Actual Interest During Construction & Financing Fees

Debt Service, ROE and ROEDC shall be adjusted on account of actual variation in drawdown and Interest During Construction & Financing Fees with reference to the estimated figure of US\$12.704 million and US\$ 3.415 million respectively. Adjustment on account of financing fees is restricted to the extent of 3% of total financing.

I.(v) Adjustment due to Custom Duties & Taxes

Debt Service, Return on Equity and ROE during construction shall be adjusted on account of actual variation in custom duties and withholding taxes with reference to the estimated figure of US\$6.549 million and US\$2.6 million respectively.

I.(vi) Adjustment for variation in Dollar/Rupee parity

Relevant reference tariff components shall be adjusted at COD on account of variation in Dollar/Rupee parity.

II. Adjustment in Insurance as per actual

The actual insurance cost for the minimum cover required under contractual obligations with the Power Purchaser, not exceeding 1.35% of the EPC cost, will be treated as pass-through. Insurance component of reference tariff shall be adjusted as per actual on yearly basis upon the production of authentic documentary evidence by GEPL according to the following formula;

$$\text{Insurance}_{(Adj.)} = AIC / P_{(Ref)} * P_{(Act)} / 79.49 * ER_{(Rev)}$$

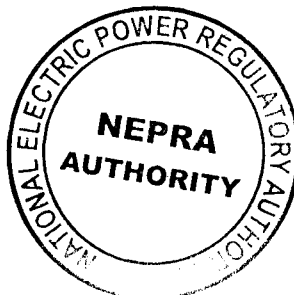
Where;

AIC = Adjusted Insurance Component (Rs. kW/hr) as per IDC Test

$P_{(Ref)}$ = Premium subject to maximum of 1.35% of the adjusted EPC

$P_{(Act)}$ = Actual Premium or 1.35% of the adjusted EPC whichever is lower

$ER_{(Rev)}$ = The revised TT & OD selling rate of US dollar as notified by the National Bank of Pakistan at Invoice date





III. Adjustment in Return on Equity (ROE)

The petitioner also requested to allow quarterly adjustment on account of US\$/PKR exchange rate based on the revised TT&OD selling rate of US dollar notified by the National Bank of Pakistan (NBP). GEPL's request is inline with the decision of the Economic Coordination Committee (ECC) and is, therefore, being allowed subject to adjustment on account of exchange rate variation according to the following formula;

$$ROE_{(Rev)} = ROE_{(Ref)} * ER_{(Rev)} / ER_{(Ref)}$$

Where:

- $ROE_{(Rev)}$ = The revised ROE component of the Capacity Purchase Price
 $ROE_{(Ref)}$ = The reference ROE component of the Capacity Purchase Price
 $ER_{(Rev)}$ = The revised TT & OD selling rate of US\$ as notified by the National Bank of Pakistan
 $ER_{(Ref)}$ = The reference exchange rate of PKR 79.49 = 1 US\$.

IV. Adjustment on Return on Equity during Construction (ROEDC)

ROEDC component of tariff will be adjusted subject to exchange rate variation according to the following formula;

$$ROEDC_{(Rev)} = ROEDC_{(Ref)} * ER_{(Rev)} / ER_{(Ref)}$$

- $ROEDC_{(Rev)}$ = The revised ROEDC component of the Capacity Purchase Price,
 $ROEDC_{(Ref)}$ = The Reference ROEDC component of the Capacity Purchase Price.
 $ER_{(Rev)}$ = The revised TT & OD selling rate of US\$ as notified by the National Bank of Pakistan
 $ER_{(Ref)}$ = The reference exchange rate of PKR 79.49 = 1 US\$

V. Adjustment of Withholding Tax

Withholding tax on dividend is a pass-through item, which is allowed in accordance with the "Government Guidelines for determination of tariff for new IPPs". In a reference tariff table, withholding tax number is indicated as reference and CPPA (NTDC) shall make payment on account of withholding tax at the time of actual payment of dividend subject



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to maximum of 7.5% of 15% equity at the time of hourly payment (Rs./kW/hour) spread over a 12 months period according to the following formula:

$$\text{Withholding Tax Payable} = \{ [15\% * (E_{(\text{Ref})} - E_{(\text{Red})}) + \text{ROEDC}_{(\text{Ref})}] * 7.5\% * ER_{(\text{Rev})} / 79.49$$

Where:

$E_{(\text{Ref})}$ = Adjusted Reference Equity at COD

$E_{(\text{Red})}$ = Equity Redeemed

$\text{ROEDC}_{(\text{Ref})}$ = Reference Return on Equity During Construction

$ER_{(\text{Rev})}$ = The revised TT & OD selling rate of US dollar as notified by the National Bank of Pakistan

In case the Company does not declare a dividend in a particular year or only declares a partial dividend, then the difference in the withholding tax amount (between what is paid in that year and the total entitlement as per the Net Return on Equity) would be carried forward and accumulated so that the Company is able to recover the same in hourly payments spread over 12 months period as a pass through from the Power Purchaser in future on the basis of the total dividend pay out.

VI. Pass-Through Items

No provision for income tax, workers' profit participation fund and workers' welfare fund, any other tax, excise duty or other duty, levy, charge, surcharge or other governmental impositions, payable on the generation sales, has been accounted for in the tariff. If GEPL is obligated to pay any tax on the income purely generated from its operation i.e. Electricity Generation of power producer, the exact amount should be reimbursed by CPPA on production of original receipts. This payment may be considered as pass-through (Rs./kW/hr) payment spread over a 12 months period in addition to the capacity purchase price in the Reference Tariff. Furthermore, in such a scenario, GEPL may also submit to the CPPA details of any tax shield savings and the CPPA will deduct the amount of these savings from its payment to GEPL on account of taxation.

VII. Indexations:

The following indexation shall be applicable to the reference tariff as follows;

a) Indexation applicable to O&M

The Fixed O&M local component of Capacity Charge will be adjusted on account of Inflation (WPI) and Fixed O&M foreign component on account of variation in US CPI and dollar/Rupee exchange rate. Quarterly adjustment for local inflation, foreign inflation and exchange rate variation will be made on 1st July, 1st October, 1st January and 1st April based



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on the latest available information with respect to WPI notified by the Federal Bureau of Statistics (FBS), US CPI issued by US Bureau of Labor Statistics and revised TT & OD selling rate of US Dollar notified by the National Bank of Pakistan. The mode of indexation will be as under:

i) **Fixed O&M**

$$F O\&M_{(LREV)} = \text{Rs. } 0.0706/\text{kW}/\text{Hour} * WPI_{(REV)} / 139.37$$

$$F O\&M_{(FREV)} = \text{Rs. } 0.0940/\text{kW}/\text{Hour} * US CPI_{(REV)} / 219.96 * ER_{(REV)} / 79.49$$

Where:

$F O\&M_{(LREV)}$ = the revised applicable Fixed O&M Local Component of the Capacity Charge indexed with WPI

$F O\&M_{(FREV)}$ = the revised applicable Fixed O&M Foreign Component of the Capacity Charge indexed with US CPI and Exchange Rate variations

$WPI_{(REV)}$ = the revised wholesale Price Index (manufactures)

$WPI_{(REF)}$ = 139.37 wholesale price index (manufactures) of July 2008 notified by Federal Bureau of Statistics

$US CPI_{(REV)}$ = the revised US CPI

$US CPI_{(REF)}$ = 219.96 US CPI for the month of July 2008 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

Note: The reference numbers indicated above shall be replaced by the revised numbers after incorporating the required adjustments at COD.

ii) **Variable O&M**

The formula for indexation of variable O&M component will be as under:

$$V O\&M_{(LREV)} = (\text{Rs. } 0.0330/\text{kWh} + \text{Rs. } 0.027/\text{kWh}) * WPI_{(REV)} / 139.37$$

$$V O\&M_{(FREV)} = \text{Rs. } 0.1906/\text{kWh} * US CPI_{(REV)} / 219.96 * ER_{(REV)} / 79.49$$

Where:

$V O\&M_{(LREV)}$ = The revised applicable local variable O&M component of the capacity charge.



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V O&M _(FREV)	=	The revised applicable foreign variable O&M component of the capacity charge.
WPI _(REV)	=	the revised wholesale Price Index (manufactures)
WPI _(REF)		139.37 wholesale price index (manufactures) of July 2008 notified by Federal Bureau of Statistics
ER _(REF)	=	Reference TT & OD selling rate of US dollar of Rs. 79.49 per US\$ as notified by the National Bank of Pakistan
US CPI _(REV)	=	The revised US CPI
US CPI _(REF)	=	Reference US CPI (All Urban Consumers) of 219.964 for July 2008 as notified by the US Bureau of Labor Statistics
ER _(REV)	=	Revised TT & OD selling rate of US dollar as notified by the National Bank of Pakistan

Note: The reference Variable O&M indicated above shall be replaced with the revised numbers at COD after incorporating the required adjustment based upon the IDC Test.

iii) Adjustment for KIBOR and LIBOR variation

The interest part of fixed charge component will remain unchanged throughout the term except for the adjustment due to variations in interest rate as a result of variation in quarterly KIBOR and LIBOR according to the following formula;

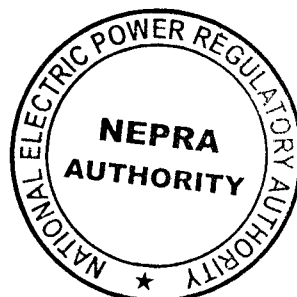
$$\Delta I_{(L)} = P_{(LREV)} * (KIBOR_{(REV)} - 10.63\%) / 4$$

$$\Delta I_{(foreign\ debt)} = P_{(REV)} * (LIBOR_{(REV)} - 5.36\%) / 4$$

Where:

$\Delta I_{(local\ debt)}$ = the variation in interest charges applicable corresponding to variation in quarterly KIBOR. ΔI can be positive or negative depending upon whether $KIBOR_{(REV)} >$ or $<$ 10.63%. The interest payment obligation will be enhanced or reduced to the extent of ΔI for each quarter under adjustment applicable on quarterly basis.

$\Delta I_{(foreign\ debt)}$ = the variation in interest charges applicable corresponding to variation in quarterly LIBOR. ΔI can be positive or negative depending upon whether $LIBOR_{(REV)} >$ or $<$ 5.36%. The interest payment obligation will be enhanced or reduced to the extent of ΔI for each quarter under adjustment applicable on quarterly basis.



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$P_{(REV)}$ = is the outstanding principal (as indicated in the attached debt service schedule to this order) on a quarterly basis on the relevant quarterly calculations date. Period 1 shall commence on the date on which the 1st installment is due after availing the grace period.

iv) Fuel Price Variation

The Variable Charge Part of the tariff relating to fuel cost shall be adjusted on account of the fuel price variations as and when notified by the relevant authority, which in the instant case is the Oil & Gas Regulatory Authority (OGRA). In this regard, the variation in GEPL's allowed rate relating to fuel cost shall be revised according to the following formula:

$$FC_{(Rev)} = FC_{(Adj)} \text{ per kWh} * FP_{(Rev)} / \text{Rs. 278.60 per MMBTU}$$

Where:

$FC_{(Rev)}$ = The revised fuel cost component of Variable Charge on low BTU gas.

$FP_{(Rev)}$ = The new price of gas as notified by the relevant Authority per MMBTU of fuel adjusted for LHV-HHV factor.

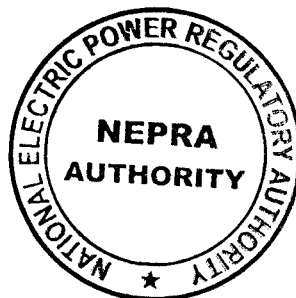
$FC_{(Adj)}$ = Adjusted fuel cost component subsequent to heat rate test at COD

Adjustment on account of local inflation, foreign inflation, foreign exchange variation, KIBOR variation and fuel price variation will be approved and announced by the Authority for immediate application within seven working days after receipt of GEPL's request for adjustment in accordance with the requisite indexation mechanism stipulated herein.

For one time adjustment of relevant tariff components at COD according to the mechanism laid down in this order, GEPL shall submit the relevant documents to NEPRA within 30 days of COD for adjustment.

VIII. Terms and Conditions of Tariff:

- i) Capacity Charge (Rs./kW/hour) applicable to dependable capacity at the delivery point.
- ii) The tariff is applicable for a period of 30 years commencing from the date of the Commercial Operation.
- iii) Use of Low BTU Gas is allowed as single fuel for operation of the plant.
- iv) All new equipment will be installed and the plant will be of standard configuration.
- v) The plant availability shall be 90%.



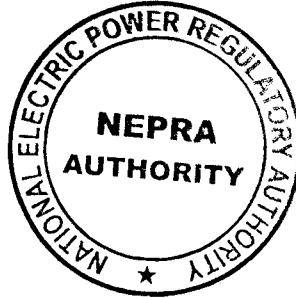
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- vi) Dispatch criterion will be based on the Energy Charge.
 - vii) Scheduled Outage periods per annum shall be in accordance with the 2006 standardized PPA.
 - viii) NTDC will be responsible for constructing the interconnection to the grid.
 - ix) All invoicing and payment terms are assumed to be in accordance with the 2006 standardized PPA.
 - x) Tolerance in Dispatch shall be in accordance with the 2006 standardized PPA.
 - xi) If there is any change in any assumption that may lead to change in the tariff shall be referred to NEPRA for approval.
 - xii) No corporate income tax and no minimum turnover tax have been assumed.

The above tariff and terms and conditions are to be incorporated in the PPA between GEPL and CPPA.

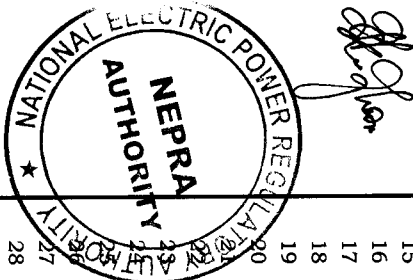


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**Green Electric Private Limited
Reference Tariff Table**

Year	Energy Charge (Rs./kWh)			Capacity Charge (Rs./kW/Hour)										Capacity Charge at 60% PF	Tariff
	Fuel	Variable O&M	Total	Fixed O&M Foreign	Fixed O&M Local	Insurance	ROE	ROEDC	Withholding Tax @7.5%	Loan Repayment	Interest Charges	Total	Rs. per kWh		
1	1.9818	0.2506	2.2324	0.0940	0.0706	0.1107	0.3073	0.0493	0.0267	0.5078	0.8020	1.9685	3.2809	5.5133	
2	1.9818	0.2506	2.2324	0.0940	0.0706	0.1107	0.3073	0.0493	0.0267	0.5590	0.7508	1.9685	3.2809	5.5133	
3	1.9818	0.2506	2.2324	0.0940	0.0706	0.1107	0.3073	0.0493	0.0267	0.6158	0.6940	1.9685	3.2809	5.5133	
4	1.9818	0.2506	2.2324	0.0940	0.0706	0.1107	0.3073	0.0493	0.0267	0.6786	0.6312	1.9685	3.2809	5.5133	
5	1.9818	0.2506	2.2324	0.0940	0.0706	0.1107	0.3073	0.0493	0.0267	0.7483	0.5615	1.9685	3.2809	5.5133	
6	1.9818	0.2506	2.2324	0.0940	0.0706	0.1107	0.3073	0.0493	0.0267	0.8256	0.4843	1.9685	3.2809	5.5133	
7	1.9818	0.2506	2.2324	0.0940	0.0706	0.1107	0.3073	0.0493	0.0267	0.9113	0.3985	1.9685	3.2809	5.5133	
8	1.9818	0.2506	2.2324	0.0940	0.0706	0.1107	0.3073	0.0493	0.0267	1.0066	0.3032	1.9685	3.2809	5.5133	
9	1.9818	0.2506	2.2324	0.0940	0.0706	0.1107	0.3073	0.0493	0.0267	1.1125	0.1974	1.9685	3.2809	5.5133	
10	1.9818	0.2506	2.2324	0.0940	0.0706	0.1107	0.3073	0.0493	0.0267	1.2302	0.0797	1.9685	3.2809	5.5133	
11	1.9818	0.2506	2.2324	0.0940	0.0706	0.1107	0.3073	0.0493	0.0267	-	-	0.6587	1.0978	3.3302	
12	1.9818	0.2506	2.2324	0.0940	0.0706	0.1107	0.3073	0.0493	0.0267	-	-	0.6587	1.0978	3.3302	
13	1.9818	0.2506	2.2324	0.0940	0.0706	0.1107	0.3073	0.0493	0.0267	-	-	0.6587	1.0978	3.3302	
14	1.9818	0.2506	2.2324	0.0940	0.0706	0.1107	0.3073	0.0493	0.0267	-	-	0.6587	1.0978	3.3302	
15	1.9818	0.2506	2.2324	0.0940	0.0706	0.1107	0.3073	0.0493	0.0267	-	-	0.6587	1.0978	3.3302	
16	1.9818	0.2506	2.2324	0.0940	0.0706	0.1107	0.3073	0.0493	0.0267	-	-	0.6587	1.0978	3.3302	
17	1.9818	0.2506	2.2324	0.0940	0.0706	0.1107	0.3073	0.0493	0.0267	-	-	0.6587	1.0978	3.3302	
18	1.9818	0.2506	2.2324	0.0940	0.0706	0.1107	0.3073	0.0493	0.0267	-	-	0.6587	1.0978	3.3302	
19	1.9818	0.2506	2.2324	0.0940	0.0706	0.1107	0.3073	0.0493	0.0267	-	-	0.6587	1.0978	3.3302	
20	1.9818	0.2506	2.2324	0.0940	0.0706	0.1107	0.3073	0.0493	0.0267	-	-	0.6587	1.0978	3.3302	
21	1.9818	0.2506	2.2324	0.0940	0.0706	0.1107	0.3073	0.0493	0.0267	-	-	0.6587	1.0978	3.3302	
22	1.9818	0.2506	2.2324	0.0940	0.0706	0.1107	0.3073	0.0493	0.0267	-	-	0.6587	1.0978	3.3302	
23	1.9818	0.2506	2.2324	0.0940	0.0706	0.1107	0.3073	0.0493	0.0267	-	-	0.6587	1.0978	3.3302	
24	1.9818	0.2506	2.2324	0.0940	0.0706	0.1107	0.3073	0.0493	0.0267	-	-	0.6587	1.0978	3.3302	
25	1.9818	0.2506	2.2324	0.0940	0.0706	0.1107	0.3073	0.0493	0.0267	-	-	0.6587	1.0978	3.3302	
26	1.9818	0.2506	2.2324	0.0940	0.0706	0.1107	0.3073	0.0493	0.0267	-	-	0.6587	1.0978	3.3302	
27	1.9818	0.2506	2.2324	0.0940	0.0706	0.1107	0.3073	0.0493	0.0267	-	-	0.6587	1.0978	3.3302	
28	1.9818	0.2506	2.2324	0.0940	0.0706	0.1107	0.3073	0.0493	0.0267	-	-	0.6587	1.0978	3.3302	
29	1.9818	0.2506	2.2324	0.0940	0.0706	0.1107	0.3073	0.0493	0.0267	-	-	0.6587	1.0978	3.3302	
30	1.9818	0.2506	2.2324	0.0940	0.0706	0.1107	0.3073	0.0493	0.0267	-	-	0.6587	1.0978	3.3302	
Levelized Tariff (1.30Years)			2.2324	0.0940	0.0706	0.1107	0.3073	0.0493	0.0267	0.4947	0.3590	1.5124	2.5207	4.7532	

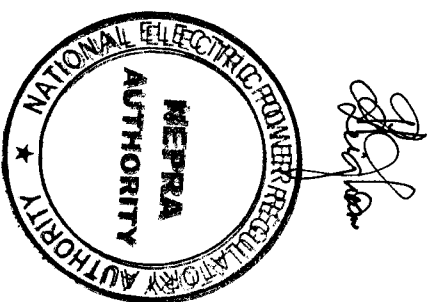


Net Capacity 171.841 MW
Reference Exchange Rate PKR 79.49= 1 US\$ PKR 101.26= 1 Euro
Reference US CPI Reference US CPI (All Urban Consumers) of 219.964 for July 2008 as notified by the US Bureau of Labor Statistics
Reference WPI (Manuf.) 139.37 wholesale price index (manufactures) of July 2008 notified by Federal Bureau of Statistics
Efficiency 47.98%
Levelized Tariff Levelized tariff in US Cents translates into 5.9796/kWh

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Green Electric Private Limited
Debt Servicing Schedule

Period	Foreign Debt					Local Debt					Annual Principal Repayment Rs./kW/ hr.	Annual Interest Rs./kW/ hr.	Annual Debt Servicing Rs./kW/ hr.
	Principal Million \$	Repayment Million \$	Mark-Up Million \$	Balance Million \$	Debt Service Million \$	Principal Million Rs.	Repayment Million Rs.	Mark-up Million Rs.	Balance Million Rs.	Debt Service Million Rs.			
1	106.70	1.73	2.23	104.97	\$3.96	3,855.39	46.58	131.37	3,808.81	177.96	0.51	0.80	1.3098
2	104.97	1.77	2.19	103.20	3.96	3,808.81	48.17	129.79	3,760.64	177.96	0.56	0.75	1.3098
3	103.20	1.81	2.16	101.40	3.96	3,760.64	49.81	128.14	3,710.83	177.96	0.62	0.69	1.3098
4	101.40	1.84	2.12	99.55	3.96	3,710.83	51.51	126.45	3,659.32	177.96	0.68	0.63	1.3098
5	106.70	7.15	8.70	99.55	15.85	3,855.39	196.08	515.75	3,659.32	177.96	0.75	0.56	1.3098
6	99.55	1.88	2.08	97.67	3.96	3,659.32	53.26	124.69	3,606.05	177.96	0.83	0.48	1.3098
7	97.67	1.92	2.04	95.75	3.96	3,606.05	55.08	122.88	3,550.97	177.96	0.91	0.40	1.3098
8	95.75	1.96	2.00	93.79	3.96	3,550.97	56.96	121.00	3,494.02	177.96	1.01	0.30	1.3098
9	93.79	2.00	1.96	91.79	3.96	3,494.02	58.90	119.06	3,435.12	177.96	1.11	0.20	1.3098
10	99.55	7.77	8.08	91.79	15.85	3,659.32	224.20	487.63	3,435.12	177.96	1.23	0.08	1.3098
	89.74	2.04	1.92	89.74	3.96	3,435.12	60.90	117.05	3,374.21	177.96			
	87.66	2.09	1.88	87.66	3.96	3,374.21	62.98	114.98	3,311.23	177.96			
	85.53	2.13	1.83	85.53	3.96	3,311.23	65.13	112.83	3,246.11	177.96			
	83.35	2.17	1.79	83.35	3.96	3,246.11	67.34	110.61	3,178.76	177.96			
	81.13	2.22	1.74	81.13	3.96	3,178.76	69.64	108.32	3,109.13	177.96			
	78.86	2.27	1.70	78.86	3.96	3,109.13	72.01	105.94	3,037.11	177.96			
	76.55	2.31	1.65	76.55	3.96	3,037.11	74.47	103.49	2,962.65	177.96			
	74.19	2.36	1.60	74.19	3.96	2,962.65	77.00	100.95	2,885.64	177.96			
	66.80	2.41	1.55	71.78	15.85	3,178.76	293.12	418.70	2,885.64	177.96			
	64.23	2.46	1.50	69.31	3.96	2,806.02	79.63	98.33	2,806.02	177.96			
	58.94	2.51	1.45	66.80	3.96	2,723.67	82.34	95.61	2,723.67	177.96			
	56.21	2.57	1.40	64.23	3.96	2,638.53	85.15	92.81	2,638.53	177.96			
	53.42	2.62	1.34	61.61	3.96	2,550.48	88.05	89.91	2,550.48	177.96			
	50.57	2.67	1.29	58.94	3.96	2,459.43	91.05	86.91	2,459.43	177.96			
	47.67	2.73	1.23	56.21	3.96	2,365.28	94.15	83.81	2,365.28	177.96			
	44.70	2.79	1.17	53.42	3.96	2,267.92	97.36	80.60	2,267.92	177.96			
	41.67	2.85	1.12	50.57	3.96	2,167.25	100.68	77.28	2,167.25	177.96			
	38.58	2.91	1.06	47.67	3.96	2,063.14	104.11	73.85	2,063.14	177.96			
	35.43	2.97	1.00	44.70	3.96	1,955.48	107.65	70.30	1,955.48	177.96			
	32.20	3.03	0.93	41.67	3.96	1,844.16	111.32	66.63	1,844.16	177.96			
	28.91	3.09	0.87	38.58	15.85	2,167.25	115.12	62.84	1,729.05	177.96			
	25.56	3.16	0.81	35.43	3.96	1,729.05	119.04	58.92	1,610.01	177.96			
	22.13	3.22	0.74	32.20	3.96	1,610.01	123.09	54.86	1,486.91	177.96			
	18.63	3.29	0.67	28.91	3.96	1,486.91	127.29	50.67	1,359.62	177.96			
	15.06	3.36	0.60	25.56	15.85	1,359.62	131.63	46.33	1,228.00	177.96			
	11.41	3.43	0.53	22.13	3.96	1,228.00	136.11	41.84	1,091.88	177.96			
	7.68	3.50	0.46	18.63	3.96	1,091.88	140.75	37.21	951.13	177.96			
	3.88	3.57	0.39	15.06	3.96	805.59	145.55	32.41	805.59	177.96			
	15.06	13.86	1.99	15.06	15.85	1,228.00	150.51	27.45	655.08	177.96			
	11.41	3.65	0.31	11.41	3.96	655.08	155.63	22.32	499.45	177.96			
	7.68	3.72	0.24	7.68	3.96	499.45	160.94	17.02	338.51	177.96			
	3.88	3.80	0.16	3.88	3.96	338.51	166.42	11.53	172.09	177.96			
	15.06	3.88	0.08	(0.00)	15.85	172.09	172.09	5.86	0.00	177.96			
			0.79	(0.00)		655.08	655.08	56.74	0.00	711.82			



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