

BEFORE  
THE NATIONAL ELECTRIC POWER REGULATORY AUTHORITY

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**EPC-STAGE TARIFF PETITION**

**BY: FATIMA ENERGY LIMITED**

**APPROXIMATELY 118.8 MW COGENERATION POWER PROJECT AT SANAWAN,  
TEHSIL KOT ADDU, DISTRICT MUZAFFARGARH, PAKISTAN**

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Dated: 16<sup>th</sup> of May, 2013

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## GLOSSARY

2002 Power Policy	The GOP's Policy for Power Generation Project, 2002
Company/Petitioner	Fatima Energy Limited
CIF	Cost, Insurance and Freight
COD	Commercial Operations Date
Concession Agreements	The Implementation Agreement; and the Power Purchase Agreement
CC	Capacity Charge
Co-Gen Policy	The GOP's National Policy for Power Co-Generation by Sugar Industry and Guidelines for Investors, 2008
Crushing Season	1 December till 31 March (4 months)
CSA	Coal Supply Agreement
EC	Energy Charge
ECC	Economic Coordination Council of the GOP
EPCC	Equipment, Procurement & Construction Contract
EPC Contractor	Shanghai Marine Diesel Engineering Research Institute and China Shipbuilding & Offshore International Co., Ltd; on a joint and several basis
Euro	The lawful currency of the European Union
FOB	Freight On Board
GOP	The Islamic Republic of Pakistan
HHV	Higher Heating Value
IDC	Interest During Construction
IRR	Internal Rate of Return
IPP	Independent Power Producer
KIBOR	Karachi Inter Bank Offered Rate
kcal / kg	kilocalorie / kilogram
Km	Kilometer
Kw	Kilowatt
KWh	Kilowatt hour
LHV	Lower Heating Value
LIBOR	London Inter Bank Offered Rate
LOS	Letter of Support
MW	Megawatt
MWh	Megawatt hour
NEPRA/ Authority	National Electric Power Regulatory Authority
NEPRA Act	The Regulation of Generation, Transmission and Distribution of Electric Power Act (Act No. XL) of 1997
NTDC/Power Purchaser	National Transmission and Dispatch Company Limited
O&M	Operation & Maintenance
Off-season	1 April till 30 November (8 months)
PKR	Pakistani Rupee
PPA	Power Purchase Agreement
PPIB	Private Power & Infrastructure Board

Project	The Company's proposed 118.8-MW biomass and imported coal based co-generation power project
ROE	Return on Equity
ROEDC	Return on Equity during Construction
Sponsor Company	Fatima Sugar Mills Limited
Ton or MT	Metric Tonne i.e. 1000kg
USD	United States Dollar

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## **B. TARIFF PETITION**

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### **1. INTRODUCTION**

#### **1.1 Applicable Law & Policy**

1.1.1 Under the NEPRA Act, the Authority is mandated to determine tariffs and other terms and conditions for the supply of electricity through generation, transmission and distribution.

1.1.2 This Petition is being filed before the Authority pursuant to Rule 3 of the NEPRA (Tariff Standards and Procedure) Rules, 1998, read with paragraph 1.3 of the Tariff Guidelines and the applicable provisions of the Co-Gen Policy and the 2002 Power Policy.

#### **1.2 Fatima Sugar Mills Limited (the "Sponsor Company") and Fatima Group ("Fatima Group" or the "Group") – Introductory Remarks**

1.2.1 Fatima Group has its roots since 1936 when the family commenced business. Thereafter, with the hard work done over the last 76 years, the third generation of the same family now owns Fatima Group as one of the most reputable industrial and multi-disciplinary groups of Pakistan. Today, the Group is engaged in trading of commodities, manufacturing of fertilizers, textiles, sugar, mining and energy. The Group has made exceptional progress in the last two decades by achieving a turnover of *circa* USD 732 Million and EBITDA of USD 268 Million. Further, the Group currently operates captive power plants with cumulative capacity of 159MW – supplying electricity to various entities within the Group.

1.2.2 The Sponsor Company is one of the vital units of Fatima Group principally engaged in the business of manufacture and sale of white refined sugar and molasses (as a by-product) with its daily crushing capacity of 10,500 MT. The resulting bagasse from the sugarcane is planned to be utilized as fuel in the Project. Fatima Sugar Mills Limited was incorporated as a public limited company in 1988 and the mills are located at Fazal Garh Sanawan, Tehsil Kot Adu, District Muzaffargarh in the Province of Punjab.

#### **1.3 Project Introduction**

1.3.1 The Group intends to develop a 118.8 MW co-generation power project. The Project will be located adjacent to the existing sugar mill of the Sponsor Company in District Muzaffargarh and will utilize (a) bagasse produced by such sugar mill along with other biomass; and (b) imported coal.

1.3.2 The Project is being developed through a public limited company, i.e. Fatima Energy Limited (the "Company" or the "Petitioner"), incorporated under the laws of Pakistan mainly owned by the Sponsor Company.

1.3.3 It must be noted that on weighted basis, net capacity of 50.53 MW out of the total weighted average net capacity of 100.53 MW shall be available for off-take by the Power Purchaser; whereas the remaining weighted average net capacity of 50.00 MW shall be sold directly to bulk power consumers. The rationale behind such bifurcation in a single project/SPV (and not developing a separate project/SPV) is that (i) the 118.8 MW (gross) Project would benefit from economies of scale with lower costs being passed on to the consumer (as compared to the development of two separate projects of 60.00 MW (gross) and 58.89 MW (gross) each); and (ii) there would be no need to duplicate such facilities which are presently contemplated as being shared facilities between the bifurcated single project/SPV (which thereby would not unnecessarily increase the cost/burden on the consumer). In order to ensure transparency, NEPRA determined tariff would be applicable for both bulk consumers and NTDC. Please

note that the aforementioned is being disclosed upfront for information purposes only and ought not to have any consequence on the levelized tariff determined by the Authority for the Petitioner.

#### 1.4 Project development activities

1.4.1 After conducting an extensive survey of the world market in relation to biomass technology, two French firms, i.e. Sechilienne SIDEC and CdF Ingenierie, were engaged as the technical advisor and consultant, respectively, for the Project (the "Technical Consultants"). The Technical Consultants have vast experience in relation to *inter alia* the design, development, operation and maintenance of cogeneration power plants (operating on coal and biomass) – Sechilienne SIDEC is currently managing a portfolio of 694 MW in power generation as an owner, operator and developer in diverse fuels of coal, biomass, wind and solar in France, Italy, Spain and Mauritius; whereas CdF Ingenierie has been providing quality engineering, design and construction supervision services for renewable energy power plants.

1.4.2 The Petitioner initiated an international competitive bidding process to select a turnkey EPC contractor for carrying out *inter alia* the design, engineering, procurement, construction and testing of the initially proposed 100 MW co-generation power project (which has subsequently been increased to 118.8 MW). In this context, the Instructions to Bidder ("ITB"), along with a draft EPCC and other technical documentation, was sent to various companies including:

- China National Chemical Engineering Group Corp (CNCEC), China;
- China Shipbuilding Industry Corporation (CSIC), China;
- Istro Energo Group (IEG), Slovakia;
- Sinoma Energy Conservation Company, China;
- China Machinery Engineering Corporation (CMEC), China;
- SOJITZ, Japan;
- Harbin Power Engineering, China;
- TEKONOTES, Turkey;
- VITKOVICE, Czech Republic; and
- KALEMCI, Turkey;

The deadline for submission of bids pursuant to the ITB was September 21, 2011; however due to the voltage levels revised by NTDC (from 220 KV to 132KV) on August 21, 2011, the bid submission date was extended to October 21, 2011.

The following companies submitted their bids as per the revised deadline mentioned above:

- CNCEC;
- CSIC; and
- IEG.

Each of the aforementioned bidders was subjected to rigorous technical and commercial evaluation by the Petitioner (and its consultants). In consequence hereof, CSIC was selected as the preferred bidder to undertake the Project on a turnkey basis. In relation hereto, an EPCC has been agreed between the Petitioner and the EPC Contractor at a lump-sum fixed price of US\$ 173.62 million.

The EPC Contractor is owned by CSIC which is a major state-owned enterprise group and one of China's largest shipbuilding and energy equipment groups. CSIC has 43 industrial subsidiaries and 28 R&D institutes, with a workforce of 150,000. Further, CSIC is an entity directly under the state government with state authorisation for investment and capital

management. The CSIC group has a total asset base of US\$ 38 billion; and in 2011 the total revenue of the CSIC group was 181 billion RMB.

In relation to the development of the Project; the following subsidiary of CSIC shall carry out all the necessary EPC works:

- Shanghai Marine Diesel Engineering Research Institute (SMDERI) was founded in 1963 and is a part of the Ministry of Defense, China Navy, Technology and Industry for National Defense, China Shipbuilding State Corporation and CSIC.

## 1.5 Project Timelines

The Project Company expects to achieve Financial Close of the Project by 30 Sep 2013 with commercial operations scheduled for 31 Mar 2016 given a construction period of 30 months.

## 2. PROJECT SUMMARY

### 2.1 Plant Location

The Project is located at Sanawan, Mehmoodkot, District Muzaffargarh on an area of 62 acres (including 16 acres for a residential colony adjacent to the sugar mills of the Sponsor Company). The finalized layout has been attached as Annexure – A for information.

### 2.2 Current Technology and the Proposed Technology plus Unit Size

The gross capacity of the Project shall be 118.8 MW based on Spreader Stoker technology which is proven for efficient burning of dual fuel biomass and coal. There are very few equipment suppliers globally who are specialist in this kind of technology owing to specialized techniques to incorporate either biomass or coal. Foster Wheeler of Spain was selected after detailed due diligence and competition for the supply of boilers.

For the boiler combustion system, Detroit Stoker Company of USA has been selected for providing its special Rotograte System which is considered as one of the best in the world. For steam turbines, Siemens was selected for supply of two full condensing/extraction turbines for the Project.

**Crushing Season:** Both boilers will burn bagasse during the crop season and will have provision to burn coal whenever required. All necessary measures shall be taken to acquire additional biomass from surrounding industries to overcome any shortfall. Owing to process requirement of FSML steam turbine will operate in extraction mode supplying up to 210 t/h low pressure steam from FEL consequently reducing net available capacity of plant. Since both boilers may be operating on different fuels therefore two separate tariffs during crushing season are being sought namely bagasse-season and coal-season to cover different operating scenarios.

**Off-Season:** Both boilers will use coal as fuel but can burn Bagasse which is carried forward from season stock or any additional biomass collected locally. During off-season, steam turbines will operate in full condensing modes and turbines have been designed to accommodate full steam generation of boiler providing additional electricity to the national grid.

### 2.3 Overall Plant and Energy Balance



Each unit will be designed, manufactured, installed and commissioned as per internationally accepted practices and standards. The Project's estimated key performance data and energy balance is set out below:

Fuel	Coal	Coal	Bagasse	Bagasse
Season	Non Crushing Season		Crushing Season	
Net Capacity (MW)	107.54		88.78	
Days Operation	201		120	
Net Plant Efficiency (Tariff)	28.00% (Weighted)			

Note:

The high voltage electrical interconnection of the Project to the existing transmission system will be the responsibility of the Power Purchaser and will be at the voltage level of 132kV.

**2.4 Plant Commissioning, Operating and Maintenance Philosophies**

The Petitioner has negotiated and agreed term sheet with OMS (Private) Limited, the O&M Contractor and O&M agreement shall be finalized in due course. Further, please note that the responsibilities of fuel supply, chemical/lube supply, security of the site, infrastructure management and overall asset management shall reside with the Petitioner.

**2.5 Coal Price Adjustment Mechanism**

Global coal trade is regulated through various liquid coal indices. These indices are published regularly by international companies and followed worldwide. The indices are based on actual transactions in the market and form the benchmark for different short to medium term coal contracts. The Petitioner proposes the 'API 4' which is the most commonly used and transparent indication of price adjustments.

**3. PROJECT FINANCIALS**

**3.1 Capital Structure**

The Project Cost will be funded on the basis of a Debt: Equity ratio of 75:25 implying a total debt requirement of USD 176.04 million; and a total equity requirement of USD 58.68 million, based on a Project Cost of USD 234.72 million.

In light hereof, the proposed capital structure of the Project is outlined below:

Description	Million (USD)
Equity	58.68
Debt – Local	176.04
Project Cost	234.72
Debt : Equity Ratio	75:25

### 3.2 Project Cost

The total Project Cost, expressed in United States Dollars, has been calculated after thorough analysis, evaluation and understanding of the dynamics that affect the development and operation of a co-generation power project. The breakup of the Project Cost is summarized as follows:

No.	Description	Million (USD)
A.	EPCC	173.62
B.	Non EPCC Costs	8.29
C.	Custom Duties/Withholding Taxes on On-shore EPCC	8.40
D.	Lenders' Fees & Charges	6.16
E.	Insurance	2.34
F.	Fuel during Testing	1.31
G.	O&M Mobilization Advance	2.00
H.	Project Development Costs	8.18
	<b>Project Cost (before IDC)</b>	<b>210.30</b>
I.	Interest during construction	24.42
	<b>Total Project Cost</b>	<b>234.72</b>

A reference PKR/USD exchange rate of 97.0 has been assumed for the purpose of the Petition.

### 3.3 Details of Assumed Project Cost

#### A. EPCC Cost

As submitted herein above, after carrying out a competitive and transparent bidding process spread over 12 months, the EPCC has been finalized with the EPCC price of USD 173.62 million split as follows:

- USD 95.75 million; and
- Euro 59.90 million converted at 1 Euro: 1.3 USD.

The EPCC price, for the offshore supply contract and the onshore construction contract, is split as follows:

- i) USD 77.36 million and Euro 59.9 million for the offshore supply contract; and
- ii) USD 18.39 million for the onshore construction contract.

The above price is valid for 180 days from the date of signing of the EPCC ("Validity Period"). If the financial closing is not achieved by the date of expiry of the Validity Period, then the EPCC price (as mentioned hereinabove) shall be adjusted in accordance with the formulae prescribed in the EPCC. Kindly note that the Petitioner agreed to a formula-based adjustment in the EPCC price to (i) avoid uncertainties that are associated with renegotiations; and (ii) avoid the need to return to the Authority for another request for revision in the tariff.

**B. Non - EPCC Cost**

The Non-EPCC Cost is USD 8.29 million. The details in relation to such costs are provided in the following table:

Item	USD million
Land <sup>1</sup>	1.71
Boundary Wall & Other Structures <sup>2</sup>	0.84
Administrative Block <sup>3</sup>	0.41
Residential Colony <sup>4</sup>	4.91
Permits	0.07
Station Vehicles	0.36
<b>Total</b>	<b>8.29</b>

<sup>1</sup>The total estimated land requirement is 62 acres, budgeted at a unit rate of PKR 2.7 million per acre. The Company has already acquired 47 acres, whereas the balance of 15 acres is currently in the process of acquisition.

<sup>2</sup>The cost of the boundary wall is PKR 21,000 per running meter (3,700 running meter). Further, costs in relation to other structures includes PKR 2.0 million for security offices and PKR 1.5 million for the demolition of existing structures.

<sup>3</sup>The cost of the administrative block has been budgeted at PKR 40.0 million for a total area of 10,000 square feet.

<sup>4</sup>A residential colony is necessitated due to the location of the Project near Kot Adu. The total area of the colony is approximately 178,500 square feet which includes 35 houses, a bachelor hostel, guest house, club, mosque and clinic. Further, the assumed cost hereunder also includes the cost in relation to 27,000 square feet of internal roads as well as electrification and furnishing.

**C. Custom Duties & Local Withholding Taxes**

The Petitioner has assumed custom duties and taxes @ 6% of the imported equipment. For calculation purposes, equipment equivalent to 70% of the EPCC Price has been assumed to attract custom duty. In addition, 6% local withholding tax has been assumed as payable on the on-shore portion of the EPCC Price.

Any imposition of or change in duties, levies or taxes of whatsoever nature will be incorporated and adjusted in the Project Cost at the COD.

**D. Lenders' Fees & Charges**

This includes the costs related to the Debt financing of the Project. Such costs include, *inter alia*, the lenders' up-front, arrangement and commitment fee; charges related to various letters of credit to be established in favor of various contracting parties (other than L/C confirmation charges); fees payable and stamp duty applicable on the financing documents; agency fee; security trustee fee; monitoring fee and the fees for the lenders' various advisors.

Given the power sector financing constraints of the local market, it is assumed that the lenders' fees and charges shall be capped at 3.5% of the debt amount (to be adjusted at COD as per actual).

**E. Insurance**

This head covers the cost of insurances of the Complex during the construction phase (prior to the COD).

The Petitioner, in view of the practices set by other IPPs in Pakistan and in accordance with typical requirements set out by lenders, intends to procure the following insurances during the construction phase of the Project:

- Construction All Risk Insurances (CAR);
- CAR Delay in Start-up Insurance
- Marine and Inland Transit Insurance;
- Marine - Delay-In Startup Insurances; and
- Comprehensive General Liability Insurance

Total insurance cost is assumed at 1.35% of the EPCC Cost.

The premiums payable under the above stated Pre-COD insurances do not include the administrative surcharge, the Federal Insurance Fee and the Federal Excise Duty, in each case, relating to the Pre-COD insurances; and the Petitioner prays that the same be allowed by NEPRA as part of the one-time adjustments allowed at the time of COD.

**F. Fuel during Testing**

An amount of USD 1.31 million shall be required for the cost of fuel (which is not reimbursed by the Power Purchaser) for all testing activities of the Project prior to synchronization with the grid. This amount has been assumed based on consumption of 9,360 MT of coal and 3,400 MT of bagasse during such testing.

Kindly note that current fuel prices have been assumed for the purpose of calculation; however, an adjustment will be sought at the time of COD based on the then-prevailing fuel prices.

**G. O&M Mobilization Cost**

The O&M contractor shall be mobilized 180 days prior to COD to ensure smooth takeover of the Project from the EPC Contractor at the COD. A cost of USD 2.0 million is budgeted under this head comprising of the expenses of the O&M contractor's personnel (both local and expatriates) and costs of requisite tools/equipment.

**H. Project Development Cost**

The development costs include the following:

Owner's Engineer - CdFI payments	1.62
Owner's Advisor - SIDEC payments	0.89
Independent Engineer for Testing (to be appointed by the Power Purchaser and Petitioner)	0.17
Technical Studies (load flow study, topographic survey, soil investigation, environmental examination, EIA, water & fuel assessment etc.)	0.05
Legal & Financial Advisory	0.21
SECP Fees (authorized capital)	0.17
PPIB & Regulatory Fees	0.14
Site Security during Construction (Petitioners scope under EPCC)	0.18
Administration Costs prior to Commercial Operations	4.75
<b>Total</b>	<b>8.18</b>

## I. Interest During Construction (IDC)

This has been calculated on the basis of the assumed drawdown schedule keeping in view the equity and debt injections together with the applicable interest/mark up rates.

IDC will be subject to adjustment at COD on the basis of fluctuations in base rate i.e. 3-month KIBOR, funding requirement (draw-downs) of the Project during the construction period, changes in Project Cost including changes due to Taxes and Duties, and variations in PKR / USD exchange rate.

## 4. TARIFF SUMMARY

The tariff has a typical two-part structure with an Energy Charge (EC) for the energy actually dispatched and a Capacity Charge (CC) based on the available capacity. The CC will cover Debt servicing, Return on Equity, Return on Equity during Construction, Fixed O&M, Insurance and Working Capital Financial Charges. Whereas the EC will cover fuel cost (bagasse and coal), coal and bagasse transportation cost and Variable O&M. The price of coal will be indexed using a robust indexation mechanism based on internationally traded indices as proposed in Coal Term Sheet. Transportation cost will be pass-through on actual basis. Key Tariff Assumptions are provided below:

The proposed tariff figures are as follows:

PROJECT TARIFF	Levelized Tariff	
	US cents/kWh	PKR/kWh
Coal, Non Crushing Season	6.169	5.984
Bagasse, Non Crushing Season	5.831	5.656
Coal, Crushing Season	7.140	6.926
Bagasse, Crushing Season	6.750	6.547
<b>Fuel (Weighted)</b>	<b>6.386</b>	<b>6.195</b>
Variable O&M-Local	0.169	0.164
Variable O&M-Foreign	0.234	0.227
<b>Total Energy (Weighted)</b>	<b>6.789</b>	<b>6.586</b>
Fixed O&M-Local	0.321	0.311
Fixed O&M-Foreign	0.392	0.380
Insurance	0.302	0.293
Return On Equity	1.268	1.230
Return on Equity during Construction	0.265	0.257
Working Capital	0.283	0.274
Debt Payments (Principal)	1.347	1.307
Debt Payments (Interest)	1.246	1.209
<b>Total Capacity</b>	<b>5.424</b>	<b>5.262</b>
<b>Total Tariff</b>	<b>12.214</b>	<b>11.847</b>

The reference generation tariff table for the Project is appended herewith as Annexure – B.

## Key Tariff Assumptions

Key tariff and operating assumptions are provided below:

Design, Fuel & Operating Assumptions		Units	
Gross Capacity		MW	118.8
Net Capacity (Non Crushing Season)		MW	107.54
Net Capacity (Crushing Season)		MW	88.78
Annual Weighted Average Capacity		MW	100.53
Net Capacity			
Bulk consumer		MW	50.00
FSML - Crushing Season		MW	13.0
FSML - Non Crushing Season		MW	1.0
Calorific Value LHV			
Coal		kcal/kg	6000
Bagasse		kcal/kg	1740
Operation ( 88% Availability)			321
Bagasse-Crushing Season		Days	120
Coal-Non crushing season		days	201
Weighted Average Efficiency for Tariff			28.00%
Annual Availability			88.00%
Crushing Season Dispatch (Must-Run)			100.00%
Annual Bagasse Consumption		MT	496,000
Annual Coal Consumption		MT	207,000
Base FOB Coal Price		USD/MT	82.00
Base CIF Coal Price		USD/MT	107.00
Base Coal Local Transport Cost		USD/MT	20.00
Base Bagasse Price (derived from CIF Coal Price)		USD/MT	31.03
Base Bagasse transportation and handling cost		USD/MT	3.78
<b>Project Cost Assumptions</b>			
EPC Cost		Million	USD 173.62
Project Cost (before interest during construction)		Million	USD 210.30
Total Project Cost		Million	USD 234.72
<b>O&amp;M and Insurance Assumptions</b>			
Variable O&M		US cents/kWh	0.40
Variable O&M (Local : Foreign Ratio)			42:58
Fixed O&M		million/annum	USD 5.52
Fixed O&M (Local : Foreign Ratio)			45:55
Insurance		% of EPC cost	1.35%
<b>Financing Assumptions</b>			
Equity			25.00%
Debt			75.00%
Return on Equity			
Bagasse Generation			18.00%
Coal Generation			16.00%
Withholding Tax on Dividends (pass through)			7.50%
Local Debt		% of Debt	100.00%
Foreign Debt		% of Debt	0.00%

Interest/Repayment		
Local Debt		Quarterly
Foreign Debt		N/A
Cost of Debt		
Local		3 month KIBOR plus 3.00%
Foreign		N/A

#### 4.1 Energy Charges

The Energy Charges of the reference generation tariff are based on the actual net electrical output measured in kWh and consist of:

- (a) Fuel Cost Component;
- (b) Local Variable O&M Component
- (c) Foreign Variable O&M Component.

Fuel Cost Component has been further sub-divided based on the applicable fuel i.e. coal and/or bagasse as well as generation pattern i.e. Crushing or Non-crushing Season:

##### 4.1.1 Fuel Cost Component

This component represents the fuel consumption at a guaranteed efficiency level at 100% plant load factor. As a general comment, we submit that there will be a separate fuel cost component for each generation scenario stated below and the energy invoice will be based on the applicable fuel and generation scenario.

##### Indexation and Escalation

The Fuel Cost Component (FCC) will be adjusted in accordance with price variation of fuel consumed using international coal price indices.

Coal Pricing: Proposed formula for determination of coal prices up to Karachi Port has been provided in Coal Term Sheet. Local Transportation will be payable at actual. The proposed tariff is based on a FOB Coal Price of USD 82/MT, sea freight of USD 25/MT and local transportation of USD 20/MT for a lower calorific value (ar) coal of 6,000 kcal/kg.

The Petitioner has made efforts to avoid the need for reopening of any matters relating to coal procurements and pricing. However, the coal supply agreement (CSA) is yet to be executed. The Petitioner therefore respectfully requests the Authority to allow the requisite adjustments, if any, at COD.

Based on the prevailing market conditions, the Petitioner expects a CSA with an initial term of 5 years post COD. The tariff ruling should therefore allow flexibility to cater for any changes at the time of CSA renewal, subject to the approval of the Authority and consent of the Power Purchaser.

Bagasse Pricing: As stated above, the bagasse price is proposed to be derived based on the useful heating value of the fuel and indexed to changes in the CIF Coal Price as per the formula proposed in Coal Term Sheet plus transportation and handling costs as allowed by the Authority in previous determination. The proposed formula for determination of the bagasse price is as follows:

$$B_n = ((LCV_B) / (LCV_C)) * (CCIF) + T_n$$

Where:



$B_n$  = Price of bagasse for the month n  
 $LCV_B$  = Lower Calorific Value of Bagasse  
 $LCV_C$  = Lower Calorific Value of Coal  
 $CCIF$  = the total CIF price of coal for month n as determined by the agreed coal pricing formula  
 $T_n$  = Inland transportation and handling costs based on previous Authority determined formula and base diesel price of Rs 110 per liter.

#### 4.1.2 Variable O&M

The Company has negotiated and agreed term sheet with OMS (Private) Limited and the Company is in the process of drafting the final contract in this regard. However, the term sheet contains a number of cost exclusions such as chemicals, lubricants, ash disposal as well as replacement of equipment. Certain exclusions are applicable in case of the Fixed O&M component, which are discussed in the following sections. The Company has estimated an amount of US cents 0.40/kWh as the variable portion of the operations and maintenance costs on the following basis:

	US cents/kWh
Variable O&M Fee (Based on term sheet agreed with O&M Contractor attached as Annexure – C)	0.16
Chemicals	0.05
Provision for replacement of certain capital equipment	0.15
Ash Disposal (Based on 16% ash content resulting in approximately 33,000 MT of annual ash disposal. Cost based on average carriage of 30 MT per truck and approximate transportation cost of PKR 30,000 per truck)	0.04
<b>Total</b>	<b>0.40</b>

## 4.2 Capacity Charge

The Capacity Charge component of the reference generation tariff is payable on the basis of the contract capacity established at the COD and annually thereafter. Since the net capacity of the Plant varies during the crushing and non-crushing season, a weighted average capacity of 100.53 MW has been used for the calculation of the Capacity Charge component. The calculation is based on assumption of 120 days of cane crushing season.

A detailed breakup and explanation of various components of the Capacity Charge Component is provided below.

### 4.2.1 Fixed O&M

The Fixed O&M component has been based on fixed annual costs of USD 5.52 million. This includes a fixed portion of the fee payable to the O&M contractor as well costs related to certain exclusions such as the long term service agreement with the turbine manufacturer, security services and maintenance of the residential colony. In addition, the component also includes costs related to corporate overheads and administration of the Project Company. Details of the costs applicable to Fixed O&M component are provided below:

Fixed O&M Fee (Based on term sheet agreed with O&M Contractor attached as Annexure – C)	3.30
Corporate and Administration Cost (Detailed organogram provided as Annexure – D)	1.04
Long Term Service Agreement with Turbine Manufacturer	1.08
Plant Security	0.10
<b>Total</b>	<b>5.52</b>

### 4.2.2 Insurance

The insurance cost component has been calculated based on Authority's previous rulings of 1.35% of the EPCC price.

### 4.2.3 Working Capital

The Project's working capital requirements on accounts of its unconventional nature are different from standard working capital calculations. Given the long lead time associated with coal procurement, requirement for maintaining a minimum inventory, advance payments to the fuel supplier as well as limitations associated with shipment size, the Petitioner has estimated that working capital equivalent to an average coal inventory equivalent of two shipments i.e. 83,000 MT will be required. In addition, the working capital requirement also takes into account the payment cycle of the PPA applicable to energy payments receivable from the Power Purchaser.

Based on the above, cost of working capital has been calculated on the following basis:

Energy invoice receivables at 60 days (incl. 16% GST) -	USD 8.83 million
Coal Inventory (including advance payment for coal)	83,000 MT
Cost of Coal inventory	USD 10.55 million
Total Working Capital Requirement	USD 19.37 million
Annual Working Capital Cost (3-month KIBOR + 2.0 %)	USD 2.19million

Base 3-month KIBOR = 9.30%

#### 4.2.4 Return on Equity during Construction (ROEDC) and Return on Equity (ROE)

The ROEDC and ROE components have been calculated based on a rate of return of 16% in case of coal generation and 18% in case of generation on bagasse and other biomass in line with previous rulings of the Authority on the matter.

Withholding tax payable on the payment of dividends to the equity holders of the Project is assumed to be pass-through.

#### 4.2.5 Debt Servicing Component

The Petitioner has assumed 100% provision of debt from local banks and financial institutions in calculating the debt servicing component of the tariff.

The following assumptions have been made in calculating this component:

- Amount of Debt: USD 176.04 million in local financing
- Term of debt: 10 years plus 30 months grace period
- Interest Rates: 3-month KIBOR plus 3.0%
- Base KIBOR: 9.30%
- Repayment: 40 quarterly installments starting from 3 months following scheduled commercial operations

The Project drawdown schedule and related Interest during Construction (IDC) is based on preliminary assumptions. This will be adjusted at COD on account of actual variation in interest on the basis of actual drawdown for the period during construction.

#### 4.3 Pass-Through Items

In addition to the pass-through items stipulated in the standardized PPA and in the Petition herein, any taxes, duties and levies and or governmental impositions of whatsoever nature not factored in the tariff calculation will be treated as part of the Project Cost at the time of COD.

#### 4.4 Adjustments at Commercial Operations Date (COD)

- 4.4.1 At COD, the tariff components will be adjusted by the inflation factors and reference exchange rates, as the case may be, as defined and described herein.
- 4.4.2 The relevant reference tariff components will also be adjusted on account of variation in FCY/PKR, and by the then prevailing KIBOR (if applicable). Furthermore, any debt related cost will be adjusted at COD.
- 4.4.3 Debt service, ROE and ROEDC will be adjusted on account of actual variation in debt and equity drawdown, actual interest during construction, financing costs/fees, actual customs duties and taxes. Once adjusted, the Debt service, ROE and ROEDC will be updated according to the relevant indexations.

#### 4.5 Indexation

The following indexations are applicable to the above mentioned tariff components:

Component	Indexation
Coal, Non Crushing Season	Landed Coal Price
Bagasse, Non Crushing Season	CIF Coal Price, diesel price
Coal, Crushing Season	Landed Coal Price
Bagasse, Crushing Season	CIF Coal Price, diesel price
Variable O&M-Local	Local WPI or replacement index
Variable O&M-Foreign	PKR/USD, US CPI
Fixed O&M-Local	Local WPI or replacement index
Fixed O&M-Foreign	PKR/USD, US CPI
Insurance	PKR/USD, US CPI
Return On Equity	PKR/USD
Return on Equity during Construction	PKR/USD
Working Capital	Coal Price, 3 month KIBOR
Debt Payments (Principal)	PKR/USD, if applicable
Debt Payments (Interest)	3 month KIBOR

#### 5. GENERAL ASSUMPTIONS

In addition to the assumptions taken in the foregoing paragraphs, the Petitioner's generation tariff takes into account the following assumptions. Changes in any of these will result in an appropriate adjustment to the proposed tariff:

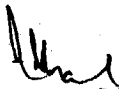
- 5.1 Annual plant availability of 88% assumed. Scheduled outage allowance of 29 days per annum assumed, except in a major overhaul year where the scheduled outage period will be 42 days. Annual unscheduled outages of 15 days are assumed.
- 5.2 It is assumed that relevant provisions shall be built in PPA and the IA to enable purchase of power by the power purchaser at rate determined by NEPRA for this petition in case the bulk power consumer for some reason is not able to purchase power from the power producer.
- 5.3 The Power Purchaser will be responsible for procuring, financing, constructing, operating and maintenance of the interconnection, metering and transmission facilities at Project site.
- 5.4 All fuels costs during plant tests after synchronization is assumed to be paid for by the Power Purchaser.
- 5.5 The tariff is calculated on the basis of a notional 88 % plant load factor.
- 5.6 No hedging cost has been assumed for exchange rate fluctuations during construction.
- 5.7 No political risk insurance has been assumed on debt and/or equity. The premium prevailing at the time of Financial Close based on the changes in the international and Pakistani macro-economic situation including Pakistan's geopolitical situation will be charged.
- 5.8 Project contingencies, debt service reserves and maintenance reserves are not included in tariff calculations. If required by the lenders, these will be adjusted accordingly in the tariff.

- 5.9 Any tax on any income of the Company including sales proceeds from NTDC, general sales tax and all other corporate taxes will be treated as pass-through items.
- 5.10 No withholding tax on supply of plant and equipment.
- 5.11 Withholding tax on dividends is considered pass through.
- 5.12 No taxes or duties (including stamp duties) have been assumed on the execution of the financing documents, loan repayment, interest repayment, agency fee, commitment fee, upfront fee and fuel purchase or transportation.
- 5.13 The Power Purchaser will be responsible for the transmission and system studies. Further, the cost of metering system (except back up meter) and remote terminal unit (RTU) will be borne by the Power Purchaser. In case the Company is required to meet this cost, it will be treated as pass-through item.
- 5.14 No free startups are assumed.
- 5.15 The tariff will be based on minimum take or pay – minimum dispatch level to be agreed with the power purchaser in due course. Any liquidated damages levied by the coal suppliers due to lower dispatch will be passed through to the Power Purchaser.
- 5.16 Additional coal (over and above the minimum take or pay) will be purchased through options and/or additional quantity from coal suppliers and/or spot market. Any additional cost and/or premia paid in this regard will be passed through to the Power Purchaser.
- 5.17 The Company has not assumed any security deposit that may be required by the coal suppliers pursuant to the CSA.
- 5.18 No royalty or any payment or fees to the relevant port authorities has been assumed.
- 5.19 If the Company is required to comply with an environmental regime more stringent than the one assumed then there will be an increase in the EPCC cost on account of equipment to be installed to offset SO<sub>x</sub> and NO<sub>x</sub> emissions. Such costs will become part of the overall Project Costs.
- 5.20 All invoicing and payment terms are assumed to be in accordance with the standardized PPA under the 2002 Power Policy.
- 5.21 Any benefit/concession/incentives given to any other IPP/projects will also be given to the Company.
- 5.22 Any additional costs incurred to cater for any modifications or additions required by the Power Purchaser will form part of the Project Cost at the COD.
- 5.23 For the purposes of the tariff petition it has been assumed that requisite amounts of coal shall be transported via trucks from the Karachi Port to the Project site. However, the Petitioner is exploring various options hereunder (in order to increase overall efficiency) including the possibility of rail transportation of coal to the Project site. The Petitioner therefore respectfully requests the Authority to allow the requisite adjustments, if any, at COD.

6. **DETERMINATION SOUGHT**

In light of the foregoing submissions, the learned Authority is kindly requested to approve the Company's generation tariff together with the pertinent indexations in accordance with the Project Costs and the assumptions related thereto mentioned above for a 30-years PPA term post COD.

The Petitioner will be pleased to provide any further information, clarification or explanation that may be required by the Authority during its evaluation process.



**Fatima Energy Limited**  
Through  
Fazal Ahmed Sheikh  
Authorized Representative

Fatima Energy 120 MW Cogeneration Project  
 Levelized Tariff - Weighted Average

**PROJECT TARIFF (30 YEARS) (PAK RUPEES /kWh)**

Year	ENERGY PURCHASE PRICE									
	Fuel					VOM			Coal-Off Season	Bagasse-Off Season (Bagasee Operation)
	Coal-Off Season	Bagasse-Off Season (Bagasee Operation)	Coal-Season	Bagasse-Season	Weighted	Local	Foreign	Total		
63%	0%	0%	37%							
1	5.9844	5.6562	6.9259	6.5473	6.1947	0.1642	0.2268	0.3911	6.3876	6.0594
2	5.9844	5.6562	6.9259	6.5473	6.1947	0.1642	0.2268	0.3911	6.3876	6.0594
3	5.9844	5.6562	6.9259	6.5473	6.1947	0.1642	0.2268	0.3911	6.3876	6.0594
4	5.9844	5.6562	6.9259	6.5473	6.1947	0.1642	0.2268	0.3911	6.3876	6.0594
5	5.9844	5.6562	6.9259	6.5473	6.1947	0.1642	0.2268	0.3911	6.3876	6.0594
6	5.9844	5.6562	6.9259	6.5473	6.1947	0.1642	0.2268	0.3911	6.3876	6.0594
7	5.9844	5.6562	6.9259	6.5473	6.1947	0.1642	0.2268	0.3911	6.3876	6.0594
8	5.9844	5.6562	6.9259	6.5473	6.1947	0.1642	0.2268	0.3911	6.3876	6.0594
9	5.9844	5.6562	6.9259	6.5473	6.1947	0.1642	0.2268	0.3911	6.3876	6.0594
10	5.9844	5.6562	6.9259	6.5473	6.1947	0.1642	0.2268	0.3911	6.3876	6.0594
11	5.9844	5.6562	6.9259	6.5473	6.1947	0.1642	0.2268	0.3911	6.3876	6.0594
12	5.9844	5.6562	6.9259	6.5473	6.1947	0.1642	0.2268	0.3911	6.3876	6.0594
13	5.9844	5.6562	6.9259	6.5473	6.1947	0.1642	0.2268	0.3911	6.3876	6.0594
14	5.9844	5.6562	6.9259	6.5473	6.1947	0.1642	0.2268	0.3911	6.3876	6.0594
15	5.9844	5.6562	6.9259	6.5473	6.1947	0.1642	0.2268	0.3911	6.3876	6.0594
16	5.9844	5.6562	6.9259	6.5473	6.1947	0.1642	0.2268	0.3911	6.3876	6.0594
17	5.9844	5.6562	6.9259	6.5473	6.1947	0.1642	0.2268	0.3911	6.3876	6.0594
18	5.9844	5.6562	6.9259	6.5473	6.1947	0.1642	0.2268	0.3911	6.3876	6.0594
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25	5.9844	5.6562	6.9259	6.5473	6.1947	0.1642	0.2268	0.3911	6.3876	6.0594
26	5.9844	5.6562	6.9259	6.5473	6.1947	0.1642	0.2268	0.3911	6.3876	6.0594
27	5.9844	5.6562	6.9259	6.5473	6.1947	0.1642	0.2268	0.3911	6.3876	6.0594
28	5.9844	5.6562	6.9259	6.5473	6.1947	0.1642	0.2268	0.3911	6.3876	6.0594
29	5.9844	5.6562	6.9259	6.5473	6.1947	0.1642	0.2268	0.3911	6.3876	6.0594
30	5.9844	5.6562	6.9259	6.5473	6.1947	0.1642	0.2268	0.3911	6.3876	6.0594
Average	5.9844	5.6562	6.9259	6.5473	6.1947	0.1642	0.2268	0.3911	6.3876	6.0594
Levelized	5.9844	5.6562	6.9259	6.5473	6.1947	0.1642	0.2268	0.3911	6.3876	6.0594







Fatima Energy 120 MW Cogeneration Project  
 Levelized Tariff - Weighted Average

**PROJECT TARIFF (30 YEARS) (US cents/kWh)**

Year	ENERGY PURCHASE PRICE									
	Fuel					VOM			Coal-Off Season	Bagasse-Off Season (Bagasee Operation)
	Coal-Off Season	Bagasse-Off Season (Bagasee Operation)	Coal-Season	Bagasse-Season	Weighted	Local	Foreign	Total		
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