



Registrar

National Electric Power Regulatory Authority
Islamic Republic of Pakistan

2nd Floor, OPF Building, G-5/2, Islamabad
Ph: 051-9206500, 9207200, Fax: 9210215
E-mail: registrar@nepra.org.pk

No.NEPRA/R/TRF-UTB-2013/5152-5154

May 29, 2013

Subject: **Determination of the Authority in the matter of Suo-Moto Proceedings for Development of Upfront Tariff for New Bagasse Based Co-Generation Power Projects - 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 herewith the subject Determination of the Authority along with Annex-I & II (23 pages).

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 of the Determination relating to the reference tariff, adjustments, indexations and terms and conditions along with Annex-I & II needs to be notified in the official Gazette.

Enclosure: As above

(Syed Safer Hussain)

Secretary
Ministry of Water & Power
'A' Block, Pak Secretariat
Islamabad

CC:

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

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

No. NEPRA/R/TRF/UTB-2013

Determination of the Authority

in the matter of

Upfront Tariff for New

Bagasse Based Co-Generation

Power Projects - 2013


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

No. NEPRA/R/TRF/UTB-2013
May 29th, 2013

Determination of Upfront Tariff for New Bagasse Based Co-Generation Power
Projects

Authority

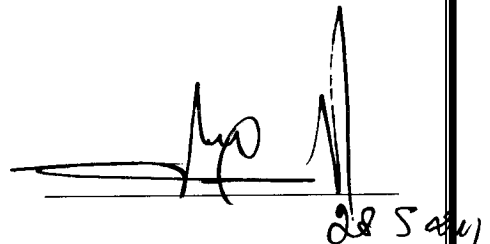
Maj. Rtd Haroon Rashid
Member

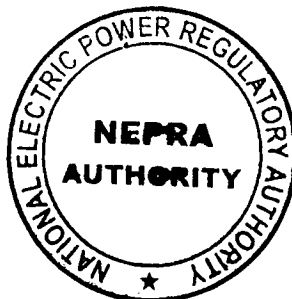

29/5/13

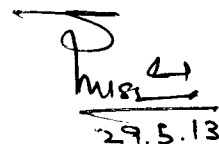
Habibullah Khilji
Member


29/5/2013

Khawaja Muhammad Naeem
Vice Chairman/Member (Tariff)


29.5.13




29.5.13

**DETERMINATION OF THE AUTHORITY IN THE MATTER OF SUO-MOTO
PROCEEDINGS FOR DEVELOPMENT OF UPFRONT TARIFF FOR NEW
BAGASSE BASED
CO-GENERATION POWER PROJECTS**

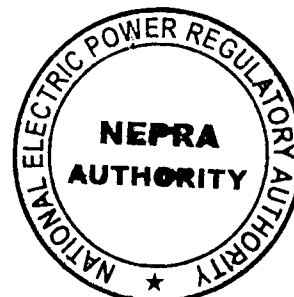
1. BACKGROUND

1.1 In pursuance of the Counsel of Common Interests (CCI) decision in its meeting in case No. CCI.4/3/2012 dated November 8, 2012 wherein CCI decided "to pursue NEPRA to finalize determination of Upfront Tariffs for bagasse, solar and coal generation" and subsequent amendment/modification in the Government of Pakistan Policy for Renewable Energy Projects 2006, to encourage and promote development of bagasse based Co-generation projects on fast track basis through Frame work for Power Co-generation 2013 (bagasse/biomass) approved by the ECC, the National Electric Power Regulatory Authority (hereinafter referred to as the "Authority") initiated Suo Moto proceedings under Regulation 3(1) of the NEPRA Upfront Tariff (Approval & Procedure) Regulations 2011, for the development and determination of Upfront Tariff for new bagasse based co-generation power projects. The Authority initiated the Suo Moto proceedings considering and being cognizant of the fact that the development of Upfront Tariff will play a vital role in facilitating and attracting potential investors for fast track development of cogeneration power projects in the country. Accordingly, the Authority developed a proposal of Upfront Tariff for bagasse based Co-generation projects on the basis of initial discussions with relevant stakeholders and information available from other sources.

1.2 In pursuance of Regulation 3(2) of the NEPRA Upfront-Tariff (Approval & Procedure) Regulations, 2011, the Authority decided to hold a public hearing in the matter to arrive at just and informed decision through participation and feedback of all the stakeholders. Accordingly, notice for hearing was published in the daily newspapers on April 27, 2013 for information and comments of all interested persons/parties either in favor or against the proposal. Written notices were also sent to the main stakeholders who, in the opinion of the Authority, were likely to be interested or affected.

1.3 The hearing in the matter was held on May 7, 2013 at Marriott Hotel Islamabad, and attended by various prospective investors, AEDB, HESCO and other stakeholders. The representatives of Pakistan Sugar Mills Association (Punjab Zone) also presented its views on the technical and financial aspects of the proposal. The comments of commentators and other stakeholders have been addressed, deliberated and discussed wherever appropriate under relevant paragraphs and issues.

1.4 Based on proceedings of the case as well as comments/views expressed by the stakeholders during the hearing, the Authority framed following major issues for deliberations and discussion and to arrive at a just and fair assessment of various financial and technical



aspects of Upfront Tariff for bagasse based cogeneration projects while being mindful of the interest of the average consumer as well as the potential investors.

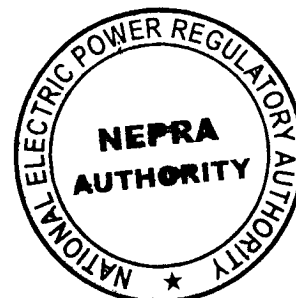
- i) Applicability of Upfront Tariff
- ii) Capacity of bagasse based co-generation power projects
- iii) Fuel
- iv) Auxiliary Consumption
- v) Annual Plant Factor
- vi) Net Efficiency (net heat rate)
- vii) Fuel Price (Bagasse)
- viii) Project Construction Period
- ix) Tariff Control Period
- x) Project Cost
- xi) Terms of Debt
- xii) Terms of Equity
- xiii) O&M Cost
- xiv) Working Capital cost
- xv) Insurance cost
- xvi) Withholding Tax
- xvii) Levelized Tariff

2. Applicability of Upfront Tariff

2.1 The Upfront Tariff has been developed for New Co-generation power projects. Presently, numerous sugar mills are already engaged in electricity production for their self use as well as supplying surplus power to the grid (distribution companies) at negotiated rates/tariff already approved by the Authority. This Upfront tariff is structured and determined for sugar mills (investors) who will install new power plant and machinery either within or outside the premises of sugar mills.

2.2 Mr. Bashir Ahmed Khadim, a consultant, representing Noon Sugar Mills in the hearing suggested that Upfront Tariff should be made available for old power units already installed by the sugar mills in the country.

2.3 The Authority has gone through the comments and suggestions of mr. Bashir Ahmed Khadim regarding applicability of Upfront Tariff. The Authority is cognizant of the fact that numerous sugar mills in the country are already in the business of supplying surplus power to the distribution companies generated from their low pressure and low efficiency plants at agreed rates with the respective distribution companies through time bound Power Purchase agreements (PPAs) approved by the Authority under the NEPRA Interim Power Procurement (Standards and Procedure) Regulations 2005.



2.4 The Authority is of view that power generated from existing power projects installed at sugar mills is not based on efficient utilization of bagasse because of old technology and less efficient plants which proportionately require larger quantities of bagasse for power generation. Although bagasse is a renewable energy resource, it is nevertheless a precious energy resource since its yearly supply is limited. Therefore, this Upfront Tariff has been designed to promote new efficient plants with latest technology on higher pressure boiler of 60 bars and above to ensure optimal utilization of this resource so that more energy for a comparatively longer period of a year could be harnessed and made available to the grid.

2.5 The framework for co-generation projects approved by the ECC and included as part of GOP Renewable Energy Policy 2006 also provides that co-generation policy will be applicable for high-pressure boiler minimum 60 bars for projects to be established as part of existing sugar mill or as a separate entity.

2.6 In view of the abovementioned facts, the Authority has decided that the Upfront Tariff will only be available for new power plants to be installed by the sugar mills in accordance with the frame work for co-generation approved by the Government of Pakistan, while the existing regime of old power plants already installed by the sugar mills and supplying power to distribution companies at negotiated rates will continue in parallel.

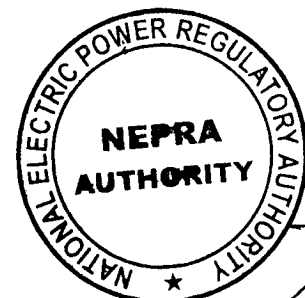
3. Capacity of bagasse based Co-generation power projects

3.1 The upfront Tariff has been developed by taking notional capacity of 1 MW. This a generic tariff and will be applicable for various sizes of capacity to be installed by the Co-generation projects. The Authority, has therefore decided that it shall not limit the maximum or minimum capacity for the purpose of this Upfront tariff rather, considers it fair that the selection of the project size should best be left at the discretion of project sponsors, who will install the optimum capacity depending on their own assessment for size of investment and availability of Bagasse.

4. Fuel

4.1 The fuel cost component of Upfront Tariff has been based on single fuel i.e. Bagasse which would be available to the sugar mills as a by-product of the sugar production cycle. Annual statistics available at web site of PSMA show that about 48 million ton of sugar cane was crushed by 86 sugar mills in the country during 2011-12 producing about 14.4 million ton of bagasse at an average yield rate of 30%, which is sufficient to produce about 1500 MW of additional power from the new co-generation power plants.

4.2 In the hearing, a question was raised by Mr. Muhammad Ali representing Mirpurkhas Sugar Mills, whether or not the co-generation projects will be allowed to burn coal along with bagasse for power generation.



4.3 It is pertinent to mentioned here that the travelling grate boilers expected to be installed by co-generation projects will be designed with primary fuel of Bagasse. However, multiple biomass fuels as well as coal can be used in these boilers with slight modifications in the design, specifications and metallurgy. The Authority considers that the Upfront Tariff for co-generation projects is aimed at promoting optimum utilization of indigenous resources available in the country. In the opinion of the Authority, the usage of coal for power generation in travelling grate boilers is not economic and efficient given their comparatively low designed efficiency as compared to stand alone coal thermal power plants with designed efficiency of 40% and above based on latest technology available today.

4.4 The Authority has therefore decided that Co-generation power plants will not be allowed to use Coal either in combination with bagasse or as single source of fuel for power generation. However there will be no restriction for co-generation projects on use of other biomass fuels such as rice husk, cotton stalk etc as per their requirement.

5. Auxiliary Consumption

5.1 Auxiliary consumption of 8.50% was assumed in the original proposal advertised by the Authority for feedback and discussed in the hearing. This figure of auxiliary consumption was based on the assumption that auxiliary equipment solely meant for power generation to be exported to the grid shall be allowed without taking in to account any usage of such equipment for self consumption by the sugar mills. Further, the Authority while proposing auxiliary consumption of 8.5% also noted that the same figure has been approved for Co-generation projects based on bagasse by the regulator in our neighboring country India.

5.2 PSMA in its presentation to the Authority during the hearing objected on lower benchmark for auxiliary consumption proposed by the Authority and suggested that auxiliary consumption for co-generation projects may be increased be to at least 10%.

5.3 The Authority has considered the suggestion of PSMA for increase in auxiliary consumption from 8.5% to 10%. The Authority considers that the auxiliary consumption of 8.5% already proposed by it is quite reasonable and has been fixed after thorough due diligence on the basis of available information as well as auxiliary consumption for co-generation projects approved in other countries. The Authority therefore finds no justification for further increase in auxiliary consumption without a ny detailed working or rationale provided to it by the PSMA.

5.4 The Authority, therefore, has decided to maintain its earlier proposed auxiliary consumption of 8.5% for the purpose of calculating Upfront for co-generation projects.

6. Annual Plant Factor

6.1 The Authority in its proposal for Upfront Tariff has assumed annual plant capacity factor (APCL) of 50% for Co-generation projects.



6.2 PSMA in its presentation to the Authority in the hearing objected that 50% APCL as proposed by the Authority is not achievable based on the period of sugar cane crushing season and bagasse availability to the sugar mills during off season for power generation. PSMA submitted that actual crushing season in our country lasts for 100-110 days whereas in our neighboring country the regulator has fixed APCL of 45% based on 180 days (120 days crushing season and 60 days off season) Therefore adjusting for shorter crushing season in our country, the realistic APCL for Co-generation projects works out to be around 40% which may be considered by the Authority.

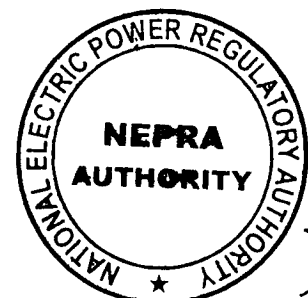
6.3 Another commentator representing Almoiz industries stated that Almoiz sugar mills due to their high pressure boiler and condensing steam technology is able to save enough bagasse enabling them to operate their power plant for 8 to 9 months of the year.

6.4 It may be mentioned here that by induction of high pressure boilers i.e above 60 bars and with installation of appropriate condensing steam turbine technology, the usage of bagasse per unit of electricity can be appreciably reduced. The sugar mills would therefore be able to save substantial quantity of bagasse during the crushing season for its usage in the off season for 2 to 3 months. The Authority is however cognizant of the fact that availability of bagasse by a sugar mill is dependent on size of the sugar mill and sugar cane crushed by it during the season and therefore usage of bagasse by the co-generation plants beyond crushing season, which is on average 120 days, is limited. It is, therefore, intent of the Authority that the option for accepting Upfront Tariff should be available to maximum number of sugar mills for establishing Co-generation projects based on high pressure boilers of 60 bars and above, so that optimum utilization of renewable source i.e Bagasse could be achieved in the country.

6.5 The Authority after consideration of the all facts and comments of PSMA as well as other commentators has decided to approve APCL of 45% on the basis of 180 days and plant availability of 92% for Co-generation projects.

7. Net Efficiency (net heat rate)

7.1 The Authority in its proposal has proposed net efficiency of 24.5% for co-generation projects. PSMA in its presentation showed its reservation on high level of net efficiency proposed by the Authority for calculation of upfront tariff applicable to co-generation projects. According to PSMA, net efficiency of 24.5% travelling grate technology on bagasse is not realistic. PSMA stated that the net efficiency of bagasse based co-generation during crushing season is 18.97% and 23.53% during off season and the weighted average of this comes out to be 20.80%. PSMA further submitted that if the Authority intends not to allow any benefit of steam extraction for self consumption of co-generation projects then the maximum net efficiency that can be considered by the Authority would be for off season which in this case is 23.53%.



7.2 It is worth mentioning here that net efficiency of power plant, besides other technical parameters, is related to investment/capital cost of the project. Higher net efficiency can be achieved with installation of latest technology for producing electricity with high per MW cost. The higher initial capital cost will benefit the power producer through reduction in operational costs during operational life of the plant. The electricity regulators around the world set minimum acceptable benchmarks for costs and other technical parameters and decision for meeting these benchmarks as well as maximizing their profits within the overall rate/tariff allowed by the Regulator is left to the discretion of project sponsors. The decision of the investors to go for high efficiency plant and equipment with increased capital cost and corresponding reduced operational costs/savings is therefore based on cost/benefit analysis which is pre requisite for designing a project for the right size and the technology.

7.3 The Authority is well aware of the fact that higher than 24.5% efficiencies can be achieved with some technological improvements in the main components of plants along with installation of condensing steam units for maximum utilization of available steam for power generation by co-generation projects. In view of the aforementioned the Authority has therefore decided to approve 24.50% as net efficiency for co-generation projects.

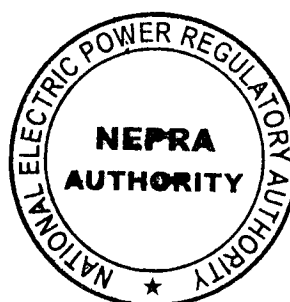
8. Fuel Price (Bagasse)

8.1 The Authority in its Upfront Tariff proposal has linked the price of Bagasse with imported coal based on Btu value of each fuel. The reason for linking baggase price with another fuel has been taken in view of the fact that published price of bagasse is not available in the country. Further no index is presently available for adjustment of bagasse price in future.

8.2 During initial discussions with stakeholders, different options for fixing price of bagasse were considered by the Authority. GTZ in its comments submitted prior to the hearing suggested that price of bagasse be linked to local coal while some others suggested that it should be linked to gas price based on their calorific (Btu) values. The Authority observed that local coal price is not published by any government agency in the country, while linkage with gas price on BTU basis is also not pragmatic for long term basis due to uncertainty of the future market in view of fast depleting resources of natural gas in the country.

8.3 The Authority in the case of two similar projects has approved bagasse price based on imported coal price of South African origin, whereby the price of bagasse is worked out on the basis of CIF price of South African coal while taking in to account net calorific value (Btu value) of both fuels.

8.4 The Authority has therefore decided that price of bagasse to be used for calculating Upfront tariff will be based on imported coal price as published for Richards Bay Terminal in the Argus McCloskey's API 4 (All Price Index) for each month while adding to it the cost of marine freight and insurance. Accordingly, the following basic benchmarks/parameters have



been approved for working out the reference price of bagasse and the reference fuel cost component of Upfront Tariff as given hereunder.

Parameters	Bagasse	Imported Coal
Net calorific value (Btu/Kg)	6905	23810
Price of imported coal FOB (Ton)		US\$ 81.40 Rs. 7977.20
Marine freight (Ton)		US\$ 19.19 or Rs. 1880.62
Marine Insurance (0.1% of coal price)		US\$ 0.0814 or Rs. 7.98
Price of Coal CIF (Ton)		US\$ 100.67 or Rs. 9865.80
Price of Bagasse per ton (Rs)	Rs. 2861.12	
Net Efficiency	24.5% or 13926 btu	
Quantity of Bagasse per kWh (Kg)	2.017	
Fuel cost component of tariff (Rs./kWh)	5.7703	

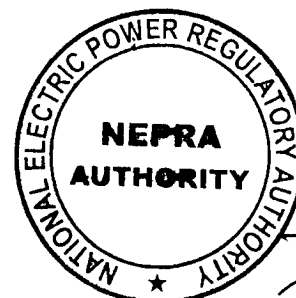
9. Project Construction Period

9.1 The Authority had proposed 20 months period for construction of all co-generation projects. The period of 20 months was proposed based on initial discussions with stakeholders. PSMA in the hearing has suggested that project construction period may be increased to 24 months given the lead time for imported plant & equipment and limited capacity to manufacture high-pressure boilers locally.

9.2 Under the GOP Policy for Renewable Energy Projects 2006, the actual project construction period is reckoned from the date of financial close of the project, while projects also require sufficient time to negotiate and finalize Power Purchase Agreements and financing documents to achieve financial close. In view of the aforementioned the Authority has decided that the project construction period from date of financial close shall be 20 months. However, co-generation projects will be required to achieve Commercial Operation Date (COD) in 24 months from the date of acceptance and approval by the Authority of Upfront Tariff by the sponsors of Co-generation projects.

10. Tariff Control Period

10.1 The Authority in its Upfront Tariff proposal has assumed 20 years term for application of Upfront Tariff. However during discussions in the public hearing and further suggestions received from PSMA, the Authority has decided to increase term of tariff from 20 to 30 years. The decision of the Authority for increasing term of tariff from 20 to 30 years has been taken in the interest of power purchaser who will be benefited from reduced tariff after first ten years of operation for a longer period of time.



11. Project Cost

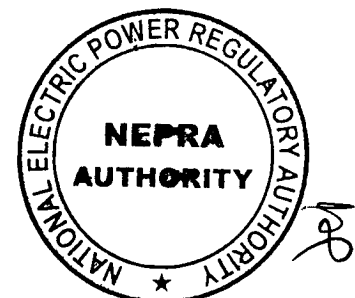
11.1 Total project cost for Co-generation projects inclusive of Interest during construction (IDC) was assumed to be US\$ 0.9966 million per MW in the proposal for Upfront Tariff for discussion, deliberation and feedback in the hearing as per the following breakup.

Project Cost	(US\$ M)
EPC Cost	0.8112
Other Project Cost	0.0695
Financing Fees & Charges	0.0176
Interest during Construction (IDC)	0.0984
Total	0.9966

11.2 PSMA during the hearing stated that the total project cost on per MW basis assumed by the Authority for Co-generation projects is quite on the lower side and does not reflect the market realities. PSMA argued that the Authority in other such cases has approved EPC cost of US\$ 1.26 million to US\$ 1.5 million on per MW basis whereas EPC cost internationally ranges between US\$ 1.4 million to US\$ 2.0 million per MW.

11.3 The Authority has carefully gone through the comments of PSMA and is of view that proposed total project cost was assumed while taking into account cost for the same component approved by the regulators in our neighboring country (India). The project cost as proposed is approximately 23% higher than the same cost allowed by the regulators in India for Co-generation projects. The aforementioned allowance of 23% has been assessed to account for additional cost of imported plant and equipment mainly turbines, switchyard, cooling tower, panels etc due to lack of local manufacturing facilities in the country.

11.4 The Authority has considered PSMA's request for increase in per MW project cost and found that cost of power plant varies on per MW basis with size and quality/technology of equipment. The large size power plant may have lower per MW cost as compared to small power plants because of economies of scale. The Authority however noted that the proposed project cost and Upfront Tariff is generic and is therefore applicable for all co-generation projects to be established with different plant size and technology. Information available with the Authority reveals that incremental project cost with 44 bars boiler to 64 bars boiler is about 30% whereas additional energy to be produced from the same quantity of bagasse is annually around 16%. For projects employing latest technology (condensing turbines) may have higher per MW capital cost, but would be allowed to retain gains/savings resulting from reduced operational costs during the term of Upfront Tariff. The project investors therefore have an option to select their plant and other equipment as per their requirement based on cost/benefit analysis and maximization of net present value of the project.



11.5 In view of the aforementioned, the Authority considers that total project cost of US\$ 0.9966 million per MW already proposed by it is quite reasonable and therefore decides to approve the same.

12. Terms of Debt

12.1 The Upfront Tariff proposal was structured and developed on the basis of 80% debt financing. The term of loan after COD was 10 years and debt servicing was calculated for local financing based on quarterly KIBOR (at 9.5%) and spread of 3%.

12.2 PSMA in its presentation during the hearing stated that local banks in the country do not offer more than 6 years term for debt repayment and therefore the period for repayment may be reduced to 6 years. Further it was also suggested that Upfront Tariff should be structured on debt to equity ratio of 70% and 30% respectively as per demand of the lenders/banks.

12.3 The Authority for other power projects has allowed minimum of 10 years debt repayment period. Taking shorter period i.e. 6 years as suggested by PSMA would increase the overall tariff for the first 6 years as well as levelized tariff for 30 years term. Similarly changing debt composition from 80% to 70% would have negative effect on the proposed Upfront tariff.

12.4 The Authority considers that it has approved a generic Upfront Tariff for Co-generation projects based on certain benchmarks and it is quite understood that actual amount of debt repayment and interest charges as well as other costs of co-generation projects opting for Upfront Tariff may not exactly match with Authority's approved costs and benchmarks due to different plant sizes, project costs and timing and terms of debt settled with the banks.

12.5 The Authority has therefore decided that it shall not change its already proposed terms of debt at this stage.

13. Terms of Equity

13.1 The Authority in its Upfront Tariff proposal has assumed 20% of total project cost as equity to be financed by the project sponsors. Return on equity was calculated at 17% (IRR based) while taking in to account 20 months project construction period for 20 years term of PPA.

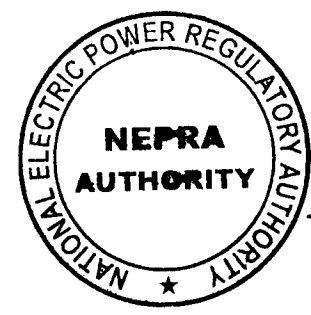
13.2 PSMA in the hearing has suggested that 30% equity of the total project cost may be allowed in the Upfront Tariff.

13.3 The Authority has already decided not to change its proposed terms of debt as discussed in the earlier paragraphs, therefore, the Authority hereby approves 20% of total project cost as equity investment. Accordingly return on equity at 17% (IRR based) for 30 years term of tariff as already discussed in the preceding paragraphs has been taken into account for calculating return on equity component of tariff.

M

9

W



12/9

14. O&M Cost

14.1 The annual O&M cost of US\$ 0.0264 million on the basis of 3.25% of EPC cost was assumed for co-generation projects in the initial proposal advertised by the Authority. PSMA in the hearing suggested that per annum O&M cost should be at least 4.5% of the EPC in line with the Authority's approved cost for other such projects. PSMA further stated that O&M cost per unit in their case would be higher than other such projects due to comparatively lower plant factor and the power purchaser will only be paying O&M cost on the basis of units of electricity delivered to it.

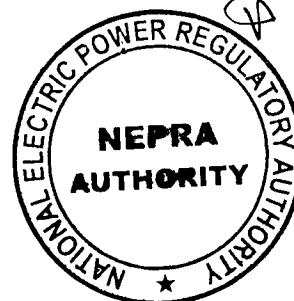
14.2 The Authority considers that the O&M cost based on 3.25% of the EPC cost as already proposed by it is quite genuine and realistic for co-generation projects based on Bagasse. The Authority observed that per annum O&M cost approved by the electricity regulators in our neighboring country ranges between 2.5% to 4.5% of their approved capital cost, whereas its Central Electricity Regulator CERC has approved Rs. 16 Lakh /MW (Indian Rupees) or US\$ 0.0294 million for per annum O&M cost (including Insurance expense) for the first year with 5.72% per annum escalation.

14.3 In the opinion of the Authority the per annum O&M cost of US\$ 0.264 million on the basis of 3.25% of the EPC cost together with 1% insurance cost considered separately in the Upfront Tariff proposal is quite comparable with O&M cost allowed in our neighboring country. The Authority has therefore decided to allow US\$ 0.264 million per MW (Rs. 2.5837 million) for annual O&M cost. The total per annum O&M cost has been further bifurcated into fixed and variable component in proportion of 40% and 60% respectively. The 75% of variable O&M cost has taken as foreign component while 25% local component. Normal indexations on account of exchange rate variation and inflation as available to other projects will also be applicable for Co-generation projects. The foreign component of variable O&M cost will be adjusted on the basis of PKR/US\$ exchange rate with respect to reference exchange rate of Rs. 98.0 as well as inflation based on US CPI. For local component of O&M cost local inflation based on local CPI will be applicable as per the O&M cost indexation mechanism given in the order of the Authority.

15. Working Capital cost

15.1 The Authority has proposed working capital cost (interest charges) based on KIBOR at 9.5% plus 2% spread for 45 days fuel invoice receivable. However no comments either in favor or against the proposed working capital cost have been made either by PSMA or other commentators during hearing on the proposed Upfront Tariff.

15.2 The Authority considers that Co-generation projects would require additional funds to finance their working capital requirements due to the difference between the actual cost payments and payment of invoice by the power purchaser. In view hereof the Authority has



decided to allow working capital cost i.e. interest charges only based on KIBOR plus 2% spread for 45 days of fuel invoice receivable period in line with other projects.

15.3 The working capital component of tariff will be adjusted quarterly based on variation in three months KIBOR.

16. **Insurance cost**

16.1 The Authority has proposed annual insurance expense of US\$ 0.00811 million (Rs. 0.7952 million) per MW on the basis of 1% of the EPC cost. PSMA in the hearing has suggested that it should be increase to 1.35% of the EPC cost as already allowed by the Authority in other cases. The proposed annual insurance expense at 1% was based on the rationale that insurance expense in the case of co-generation would be comparatively lower than stand alone IPPs due to sharing of infrastructure facilities and equipment between sugar mills for self their consumption.

16.2 The Authority considers that annual insurance expense at 1% of the EPC cost is quite reasonable to meet the minimum insurance requirement for its plant and equipment and is, therefore, approved.

17. **Withholding Tax**

17.1 Withholding tax at 7.5% of the return on equity based on 20% equity financing has not been taken in to account while calculating Upfront Tariff for co-generation projects. Withholding Tax is a pass through cost for the power producer and shall be paid by the power purchaser on the basis of actual payment of dividends subject to the maximum of 7.5% of the 17% return on equity investment of 20% of the total project cost.

18. **Levelized Tariff**

18.1 Based on approved cost of various components of tariff, the levelized tariff based on 30 years term has been worked out to be US cents 10.6202/kWh or Rs. 10.4078/kWh as given hereunder.

Tariff	US cents/kWh	Rs/kWh
For first 10 years	11.9791	11.7396
For 11-30 years	8.0763	7.9147
Levelized Tariff 1-30 years	10.6202	10.4078

M

Handwritten annotations including a vertical line and arrows pointing to the table.



Handwritten signature or initials.

19. Order

The Authority hereby determines and approves the following Upfront Tariff for New Bagasse based Co-generation projects for delivery of electricity to the power purchaser.

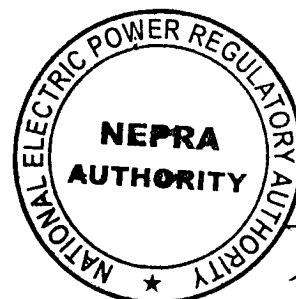
Tariff components	1-10 years (Rs./kWh)	11-30 years (Rs./kWh)	Indexations
Fuel Cost	5.7702	5.7702	Fuel price
Variable O&M Local	0.1074	0.1074	PKR/US\$, Local CPI
Variable O&M Foreign	0.3223	0.3223	PKR/US\$, US CPI
Fixed O&M Local	0.2865	0.2865	Local CPI
Insurance	0.2204	0.2204	-
Working Capital	0.1924	0.1924	KIBOR
Debt Service	3.8249	-	KIBOR
Return on Equity	1.0155	1.0155	PKR/US\$
Total	11.7396	7.9147	

- i) The above reference tariff is applicable for 30 years from commencement of commercial operation date (COD).
- ii) The above tariff is applicable for new Co-generation projects based on Bagasse.
- iii) The above tariff has been worked out on the basis of reference PKR/US\$ rate of Rs. 98.0.
- iv) The reference component wise Upfront Tariff table is attached herewith as Annex-I
- v) The reference Debt Service schedule is attached herewith as Annex-II.

I. Pass-Through Items

If the company is obligated to pay any tax on its income from generation of electricity, or any duties and/or taxes, not being of refundable nature, are imposed on the company up to the commencement of its commercial operations for import of its plant, machinery and equipment, the exact amount paid by the company on these accounts shall be reimbursed by the power purchaser on production of original receipts. This payment should be considered as a pass-through payment spread over a twelve months period. Furthermore, in such a scenario, the company shall also submit to the power purchaser details of any tax savings and the power purchaser shall deduct the amount of these savings from its payment to the company on account of taxation.

The adjustment for duties and/or taxes will be restricted only to the extent of duties and/or taxes directly imposed on the company. No adjustment for duties and/or taxes imposed on third parties such as contractors, suppliers, consultants, etc. excluding adjustment for taxes imposed on dividend as stated below, will be allowed.



Withholding tax on dividends will also be allowed as a pass through item just like other taxes. The power purchaser shall make payment on account of withholding tax at the time of actual payment of dividend, on production of original receipts, subject to maximum of 7.5% of return on equity. 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 as a pass through from the power purchaser in future on the basis of the total dividend payout. Adjustment for variation in tax rate on dividend from 7.5% shall also be allowed as a pass through item by the power purchaser, after satisfying itself that tax rates have actually varied. The company shall also submit to the power purchaser details of any tax savings and the power purchaser shall deduct the amount of these savings from its payment to the company on account of taxation.

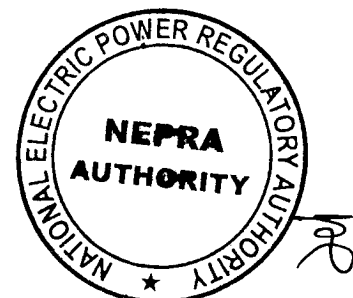
II. One-Time Adjustment

The reference Upfront Tariff will be adjusted at commercial operation date (COD) which in this case will be May 31, 2015, to account for variations during the project construction period. The following adjustment in the reference Upfront tariff will be allowed.

- i) The 40% of the approved total project cost has been assumed in foreign currency (USD) which shall be adjusted with respect to PKR/US\$ exchange rate variation to be worked out on quarterly basis as per the assumed schedule of debt and equity injections spread over 20 months of project construction period starting from October 01, 2013 as given hereunder.

Debt & Equity Injections	Qtr.1	Qtr. 2	Qtr.3	Qtr. 4	Qtr.5	Qtr.6	2 months	Total
% of total project cost	20%	20%	15%	15%	10%	10%	10%	100%

- ii) The debt service component of reference Upfront Tariff will be adjusted on account on variation in quarterly KIBOR over the reference KIBOR of 9.50% plus spread on KIBOR at 3%.
- iii) The return on equity component (ROE) including return on equity during construction component (ROEDC) of reference Upfront Tariff will be revised on account of variation in PKR/US\$ exchange rate over the reference PKR/US\$ exchange rate of Rs. 98.



III. Indexation/adjustment

The following indexation shall be applicable to the reference tariff after one-time adjustment:

a) Fuel Cost Component

Fuel cost component of tariff will be adjusted on account of variation in price of fuel (bagasse) on yearly basis in advance (w.e.f. 1st of October of each applicable year) as per the formula given hereunder.

$$FCC_{(Rev)} = FCC_{(Ref)} \times BFP_{(Rev)} / BFP_{(Ref)}$$

Where;

$FCC_{(Rev)}$ = Revised fuel cost component of tariff for the applicable year.

$FCC_{(Ref)}$ = Reference fuel cost component of tariff at the time of determination.

$BFP_{(Rev)}$ = Revised price of bagasse in Rs/ton as determined in accordance with mechanism set out below.

$BFP_{(Ref)}$ = Reference price of bagasse for the relevant year. Current reference price is Rs. 3128.661/ton

$$BFP_{(Rev)} = CPCIF_{(Rev)} \times 6905/23810$$

Where;

$$CPCIF_{(Rev)} = \{CPFOB_{(Rev)} + MF_{(Rev)} + MI_{(Rev)}\} \times ER_{(Rev)}$$

Where;

$CPCIF_{(Rev)}$ = Revised CIF price of coal in Rs/ton for the applicable year.

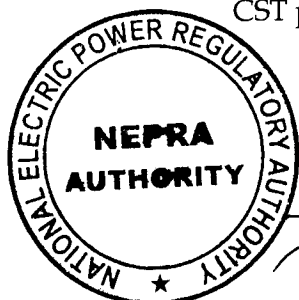
$CPFOB_{(Rev)}$ = Revised FOB price of coal expressed in US\$/ton based on monthly average of prices published in the Argus McCloskey's API4 index for the relevant year.

$MF_{(Rev)}$ = Revised marine freight of coal per ton as worked out below.

$$MF_{(Rev)} = US\$ 19.19 \times BIX_{(Rev)} / BIX_{(Ref)}$$

Where;

$BIX_{(Rev)}$ = Revised monthly average of the daily Bunker Index price for 380-CST published by the Bunker Index for the relevant year.



- $BIX_{(Ref)}$ = Reference monthly average of the daily Bunker Index price of 380-CST published by the Bunker Index. Current reference for the month of April 2013 is US\$ 641.8219/ton.
- $MI_{(Rev)}$ = $CPFOB_{(Rev)} \times 0.1\%$
- $ER_{(Rev)}$ = Revised monthly average PKR/US\$ exchange rate for the relevant month.

The constants such as 6905, 23810 and US\$ 19.19 are fixed values representing LHV value of bagasse in btu/kg, LHV value of coal in btu/kg and fixed value of marine freight charges per ton of coal respectively.

Note:

1. Applicable year means, the year for which adjustment/indexation of fuel cost component is required starting from 1st of July and ending on 30th of June.
2. Relevant year means the year immediately preceding the applicable year for adjustment/indexation of fuel cost component.

b) O&M Cost Component

The local O&M component will be adjusted on account of local Inflation and foreign O&M component will be adjusted on account of variation in Rupee/Dollar exchange rate and US CPI. Quarterly adjustments for inflation and exchange rate variation will be made on 1st July, 1st October, 1st January & 1st April respectively on the basis of the latest available information with respect to Pakistan CPI (general), US CPI (notified 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 Local

$$F O\&M_{(REV)} = O\&M_{(REF)} * CPI_{(REV)} / 177.74$$

Where:

$F O\&M_{(REV)}$ = The revised applicable Fixed O&M local component of tariff indexed with Pakistan CPI.

$O\&M_{(REF)}$ = The reference fixed O&M local component of tariff for the relevant period.

$CPI_{(REV)}$ = The Revised Consumer Price Index (General) for the relevant month.



$CPI_{(REF)}$ = The Consumer Price Index (General) of April 2013 notified by the Federal Bureau of Statistics.

$US\ CPI_{(REV)}$ = The Revised US Consumer Price Index (All Urban Consumers) notified by the Bureau of Labor Statistics.

ii. Variable O&M

$V\ O\&M_{(LREV)} = O\&M_{(LREF)} * CPI_{(REV)} / 177.74$

$V\ O\&M_{(FREV)} = O\&M_{(FREF)} * USCPI_{(REV)} / 232.531 * ER_{(REV)} / 98$

Where:

$V\ O\&M_{(LREV)}$ = The revised applicable Variable O&M local component of tariff indexed with CPI.

$V\ O\&M_{(FREV)}$ = The revised applicable Variable O&M foreign component of tariff indexed with US CPI and exchange rate variation.

$O\&M_{(LREF)}$ = The reference variable O&M local component of tariff for the relevant period.

$O\&M_{(FREF)}$ = The reference variable O&M foreign component of tariff for the relevant period.

$CPI_{(REV)}$ = The Revised Consumer Price Index (General) for the relevant month.

$CPI_{(REF)}$ = The Consumer Price Index (General) of April 2013 notified by the Federal Bureau of Statistics

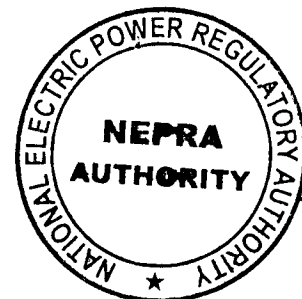
$US\ CPI_{(REV)}$ = The Revised US Consumer Price Index (All Urban Consumers) notified by the US Bureau of Labor Statistics.

$US\ CPI_{(REF)}$ = Reference US CPI (All Urban Consumers) notified by the Bureau of Labor Statistics for the month of April 2013.

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

c) Adjustment of working capital cost

The cost of working capital shall be adjusted on account of variation in 3-month KIBOR over the reference KIBOR of 9.50% while premium over KIBOR 2% remaining the same for the entire tariff control period.



d) Adjustment of debt servicing component

This fixed charge component after one-time adjustment will remain unchanged throughout the tariff control period except for the adjustment due to variation in KIBOR. The debt servicing component of tariff will be adjusted accordingly on quarterly basis.

e) Return on Equity

Return on equity (ROE) as well as Return on Equity during Construction (ROEDC) component of tariff shall be adjusted for variation in PKR/US\$ exchange rate according to the following formula:

$$ROE_{(REV)} = ROE_{(REF)} * ER_{(REV)} / ER_{(REF)}$$

$$ROEDC_{(REV)} = ROEDC_{(REF)} * ER_{(REV)} / ER_{(REF)}$$

Where;

ROE_(REV) = Revised Return on Equity component of tariff expressed in Rs/kWh adjusted with exchange rate variation.

ROEDC_(REV) = Revised Return on Equity during Construction component of tariff in Rs/kWh adjusted with exchange rate variation.

ROE_(REF) = Reference Return on Equity component of tariff expressed in Rs/kWh for the relevant period.

ROEDC_(REF) = Reference Return on Equity during Construction component of tariff expressed in Rs/kWh for the relevant period.

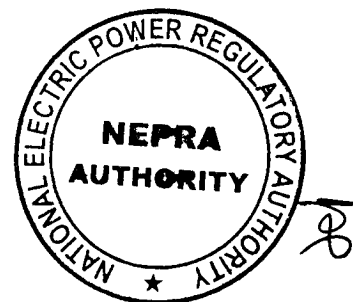
ER_(REV) = Revised TT and OD selling rate of US dollar as notified by the National Bank of Pakistan.

ER_(REF) = Reference TT and OD selling rate of US dollar.

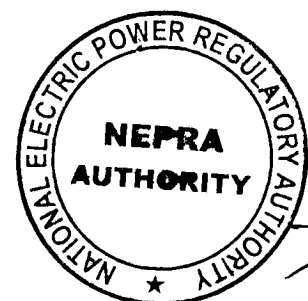
IV. Terms and conditions of Upfront Tariff

The following terms and conditions will be applicable for Co-generation projects who opt for Upfront Tariff.

- i) The Upfront tariff will be applicable for all new Co-generation projects using bagasse.
- ii) There is ~~no~~ maximum or minimum cap for the installed capacity by co-generation projects.



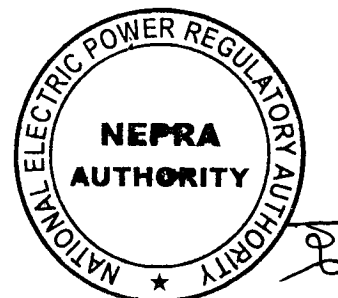
- iii) The option for accepting Upfront tariff by co-generation projects will be applicable for one year (365 days) from the date of approval of Upfront Tariff by the Authority.
- iv) The Upfront Tariff will be applicable and become effective after Commercial Operation Date (COD).
- v) The decision to opt for upfront tariff once exercised will be irrevocable.
- vi) The project sponsors will be required to achieve COD within two years from date of grant of Upfront tariff by the Authority in each case.
- vii) The sponsors interested in availing Upfront tariff will submit unconditional formal application to NEPRA for approval by the Authority in accordance with the NEPRA Upfront Tariff (Approval and Procedure) Regulations 2011.
- viii) The Power Purchaser (distribution company or NTDC/CPPA as the case may be) and Alternate Energy Development Board (AEDB) shall monitor the project progress and shall certify that all plant and machinery is new and as per the latest IEC standards.
- ix) All energy offered for sale by the Co-generation projects shall be taken by the power purchaser on priority.
- x) Co-generation Projects meeting the following conditions will be eligible for this tariff:
 - a. Projects recommended by the Alternative Energy Development Board for the grant of upfront tariff.
 - b. Projects whose proposed plant and machinery is confirmed to be new and of acceptable quality by the Alternative Energy Development Board.
 - c. Companies who have the consent of the power purchaser for procurement of electricity, along with a certificate from the power purchaser that it will have the necessary infrastructure ready and in place to evacuate all the power supplied by the applicant.
- xi) Power Producers shall have the option to offer energy to the respective Distribution Company (DISCO) at 11 KV or 132 KV, or to the CPPA/NRDC at 132 KV, provided that the cost of interconnection, grid station upgrades etc for power evacuation shall be incurred by the respective DISCO/CPPA.



- xii) This tariff will be applicable for a period of thirty years (30) from the commencement of commercial operations.
- xiii) The Co-generation projects based on foreign financing may opt for the approved Upfront Tariff. However, the risk of currency exchange rate for foreign financing will be borne by the project sponsors.
- xiv) In the Upfront Tariff no adjustment for certified emission reductions has been accounted for. However, upon actual realization of carbon credits, the same shall be distributed between the power purchaser and the power producer in accordance with the Policy for Development of Renewable Energy for Power Generation 2006, as amended from time to time.
- xv) The Co-generation projects are allowed to use other biomass fuel such as rice husk, cotton stalk etc. in combination with Bagasse or separately. However use of coal imported or local is not allowed.
- xvi) Pre-COD sale of electricity to the power purchaser, if any, will be allowed subject to the terms and conditions of PPA, at the applicable tariff excluding principal repayment of debt component and interest component.
- xvii) The Authority may, after a period of 5 years, review the fuel pricing mechanism stipulated above in accordance with NEPRA Rules, if it is deemed that the existing mechanism is not fairly representative of the market realities.
- xviii) The adjustment/indexation of upfront tariff will be made on the basis of benchmarks assumed by the Authority for Upfront Tariff in accordance with the indexation mechanism stipulated hereinabove, and a single Upfront Tariff will be applicable for all co-generation projects coming under the Upfront Tariff regime. No project specific adjustments shall be taken into account.

[Handwritten mark]

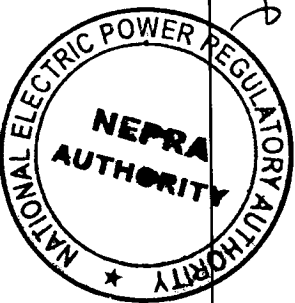
[Handwritten mark]



Reference Upfront Tariff for New Bagasse based Co-generation Power Projects

Year	Fuel cost component	Variable O&M Local	Variable O&M Foreign	Fixed O&M Local	Insurance	Working capital cost	Return on Equity	ROE During Construction	Loan Repayment	Interest Charges	Total Tariff
	Rs./kWh	Rs./kWh	Rs./kWh	Rs. / kWh	Rs. / kWh	Rs. / kWh	Rs. / kWh	Rs. / kWh	Rs. / kWh	Rs./kWh	Rs. / kWh
1	5.7702	0.1074	0.3223	0.2865	0.2204	0.1924	0.9207	0.0948	1.1705	2.6544	11.7396
2	5.7702	0.1074	0.3223	0.2865	0.2204	0.1924	0.9207	0.0948	1.3238	2.5011	11.7396
3	5.7702	0.1074	0.3223	0.2865	0.2204	0.1924	0.9207	0.0948	1.4972	2.3277	11.7396
4	5.7702	0.1074	0.3223	0.2865	0.2204	0.1924	0.9207	0.0948	1.6933	2.1316	11.7396
5	5.7702	0.1074	0.3223	0.2865	0.2204	0.1924	0.9207	0.0948	1.9150	1.9098	11.7396
6	5.7702	0.1074	0.3223	0.2865	0.2204	0.1924	0.9207	0.0948	2.1659	1.6589	11.7396
7	5.7702	0.1074	0.3223	0.2865	0.2204	0.1924	0.9207	0.0948	2.4496	1.3752	11.7396
8	5.7702	0.1074	0.3223	0.2865	0.2204	0.1924	0.9207	0.0948	2.7704	1.0544	11.7396
9	5.7702	0.1074	0.3223	0.2865	0.2204	0.1924	0.9207	0.0948	3.1333	0.6915	11.7396
10	5.7702	0.1074	0.3223	0.2865	0.2204	0.1924	0.9207	0.0948	3.5437	0.2811	11.7396
11	5.7702	0.1074	0.3223	0.2865	0.2204	0.1924	0.9207	0.0948	-	-	7.9147
12	5.7702	0.1074	0.3223	0.2865	0.2204	0.1924	0.9207	0.0948	-	-	7.9147
13	5.7702	0.1074	0.3223	0.2865	0.2204	0.1924	0.9207	0.0948	-	-	7.9147
14	5.7702	0.1074	0.3223	0.2865	0.2204	0.1924	0.9207	0.0948	-	-	7.9147
15	5.7702	0.1074	0.3223	0.2865	0.2204	0.1924	0.9207	0.0948	-	-	7.9147
16	5.7702	0.1074	0.3223	0.2865	0.2204	0.1924	0.9207	0.0948	-	-	7.9147
17	5.7702	0.1074	0.3223	0.2865	0.2204	0.1924	0.9207	0.0948	-	-	7.9147
18	5.7702	0.1074	0.3223	0.2865	0.2204	0.1924	0.9207	0.0948	-	-	7.9147
19	5.7702	0.1074	0.3223	0.2865	0.2204	0.1924	0.9207	0.0948	-	-	7.9147
20	5.7702	0.1074	0.3223	0.2865	0.2204	0.1924	0.9207	0.0948	-	-	7.9147
21	5.7702	0.1074	0.3223	0.2865	0.2204	0.1924	0.9207	0.0948	-	-	7.9147
22	5.7702	0.1074	0.3223	0.2865	0.2204	0.1924	0.9207	0.0948	-	-	7.9147
23	5.7702	0.1074	0.3223	0.2865	0.2204	0.1924	0.9207	0.0948	-	-	7.9147
24	5.7702	0.1074	0.3223	0.2865	0.2204	0.1924	0.9207	0.0948	-	-	7.9147
25	5.7702	0.1074	0.3223	0.2865	0.2204	0.1924	0.9207	0.0948	-	-	7.9147
26	5.7702	0.1074	0.3223	0.2865	0.2204	0.1924	0.9207	0.0948	-	-	7.9147
27	5.7702	0.1074	0.3223	0.2865	0.2204	0.1924	0.9207	0.0948	-	-	7.9147
28	5.7702	0.1074	0.3223	0.2865	0.2204	0.1924	0.9207	0.0948	-	-	7.9147
29	5.7702	0.1074	0.3223	0.2865	0.2204	0.1924	0.9207	0.0948	-	-	7.9147
30	5.7702	0.1074	0.3223	0.2865	0.2204	0.1924	0.9207	0.0948	-	-	7.9147
Levelized Tariff	5.7702	0.1074	0.3223	0.2865	0.2204	0.1924	0.9207	0.0948	1.2831	1.2100	10.4078

Levelized Tariff (1-30 years) discounted at 10% per annum = US Cents 10.6202/kWh at reference exchange rate of 1US\$=Rupees 98.00.



Reference Upfront Tariff for New Bagasse based Co-generation Power Projects
Debt Servicing Schedule

Period	Local Debt					Local Debt					Annual Principal Repayment Rs./kWh	Annual Interest Rs./kWh	Annual Debt Service Rs./kWh
	Principal Million \$	Repayment Million \$	Mark-Up Million \$	Balance Million \$	Debt Service Million \$	Principal Million Rupees	Repayment Million Rupees	Mark-Up Million Rupees	Balance Million Rupees	Debt Service Million Rupees			
	0.7973	0.0103	0.0249	0.7870	0.0352	78.1353	1.0072	2.4417	77.1281	3.4490	0.2792	0.6770	0.9562
	0.7870	0.0106	0.0246	0.7764	0.0352	77.1281	1.0387	2.4103	76.0893	3.4490	0.2880	0.6682	0.9562
	0.7764	0.0109	0.0243	0.7655	0.0352	76.0893	1.0712	2.3778	75.0182	3.4490	0.2970	0.6592	0.9562
	0.7655	0.0113	0.0239	0.7542	0.0352	75.0182	1.1046	2.3443	73.9135	3.4490	0.3063	0.6499	0.9562
1	0.7973	0.0431	0.0977	0.7542	0.1408	78.1353	4.2218	9.5741	73.9135	13.7958	1.1705	2.6544	3.8248
	0.7542	0.0116	0.0236	0.7426	0.0352	73.9135	1.1392	2.3098	72.7744	3.4490	0.3158	0.6404	0.9562
	0.7426	0.0120	0.0232	0.7306	0.0352	72.7744	1.1748	2.2742	71.5996	3.4490	0.3257	0.6305	0.9562
	0.7306	0.0124	0.0228	0.7182	0.0352	71.5996	1.2115	2.2375	70.3881	3.4490	0.3359	0.6203	0.9562
	0.7182	0.0127	0.0224	0.7055	0.0352	70.3881	1.2493	2.1996	69.1388	3.4490	0.3464	0.6098	0.9562
2	0.7542	0.0487	0.0921	0.7055	0.1408	73.9135	4.7747	9.0211	69.1388	13.7958	1.3238	2.5011	3.8248
	0.7055	0.0131	0.0220	0.6924	0.0352	69.1388	1.2884	2.1606	67.8504	3.4490	0.3572	0.5990	0.9562
	0.6924	0.0136	0.0216	0.6788	0.0352	67.8504	1.3286	2.1203	66.5218	3.4490	0.3684	0.5878	0.9562
	0.6788	0.0140	0.0212	0.6648	0.0352	66.5218	1.3702	2.0788	65.1516	3.4490	0.3799	0.5763	0.9562
	0.6648	0.0144	0.0208	0.6504	0.0352	65.1516	1.4130	2.0360	63.7387	3.4490	0.3917	0.5645	0.9562
3	0.7055	0.0551	0.0857	0.6504	0.1408	69.1388	5.4001	8.3957	63.7387	13.7958	1.4972	2.3277	3.8248
	0.6504	0.0149	0.0203	0.6355	0.0352	63.7387	1.4571	1.9918	62.2815	3.4490	0.4040	0.5522	0.9562
	0.6355	0.0153	0.0199	0.6202	0.0352	62.2815	1.5027	1.9463	60.7789	3.4490	0.4166	0.5396	0.9562
	0.6202	0.0158	0.0194	0.6044	0.0352	60.7789	1.5496	1.8993	59.2293	3.4490	0.4296	0.5266	0.9562
	0.6044	0.0163	0.0189	0.5881	0.0352	59.2293	1.5980	1.8509	57.6312	3.4490	0.4430	0.5132	0.9562
4	0.6504	0.0623	0.0785	0.5881	0.1408	63.7387	6.1075	7.6884	57.6312	13.7958	1.6933	2.1316	3.8248
	0.5881	0.0168	0.0184	0.5713	0.0352	57.6312	1.6480	1.8010	55.9832	3.4490	0.4569	0.4993	0.9562
	0.5713	0.0173	0.0179	0.5539	0.0352	55.9832	1.6995	1.7495	54.2838	3.4490	0.4712	0.4850	0.9562
	0.5539	0.0179	0.0173	0.5360	0.0352	54.2838	1.7526	1.6964	52.5312	3.4490	0.4859	0.4703	0.9562
	0.5360	0.0184	0.0168	0.5176	0.0352	52.5312	1.8074	1.6416	50.7238	3.4490	0.5011	0.4551	0.9562
5	0.5881	0.0705	0.0703	0.5176	0.1408	57.6312	6.9074	6.8884	50.7238	13.7958	1.9150	1.9098	3.8248
	0.5176	0.0190	0.0162	0.4986	0.0352	50.7238	1.8638	1.5851	48.8600	3.4490	0.5167	0.4395	0.9562
	0.4986	0.0196	0.0156	0.4790	0.0352	48.8600	1.9221	1.5269	46.9379	3.4490	0.5329	0.4233	0.9562
	0.4790	0.0202	0.0150	0.4587	0.0352	46.9379	1.9822	1.4668	44.9557	3.4490	0.5495	0.4067	0.9562
	0.4587	0.0209	0.0143	0.4379	0.0352	44.9557	2.0441	1.4049	42.9116	3.4490	0.5667	0.3895	0.9562
6	0.5176	0.0797	0.0611	0.4379	0.1408	50.7238	7.8122	5.9837	42.9116	13.7958	2.1659	1.6589	3.8248
	0.4379	0.0215	0.0137	0.4164	0.0352	42.9116	2.1080	1.3410	40.8037	3.4490	0.5844	0.3718	0.9562
	0.4164	0.0222	0.0130	0.3942	0.0352	40.8037	2.1738	1.2751	38.6298	3.4490	0.6027	0.3535	0.9562
	0.3942	0.0229	0.0123	0.3713	0.0352	38.6298	2.2418	1.2072	36.3880	3.4490	0.6215	0.3347	0.9562
	0.3713	0.0236	0.0116	0.3477	0.0352	36.3880	2.3118	1.1371	34.0762	3.4490	0.6409	0.3153	0.9562
7	0.4379	0.0902	0.0506	0.3477	0.1408	42.9116	8.8354	4.9604	34.0762	13.7958	2.4496	1.3752	3.8248
	0.3477	0.0243	0.0109	0.3234	0.0352	34.0762	2.3841	1.0649	31.6921	3.4490	0.6610	0.2952	0.9562
	0.3234	0.0251	0.0101	0.2983	0.0352	31.6921	2.4586	0.9904	29.2335	3.4490	0.6816	0.2746	0.9562
	0.2983	0.0259	0.0093	0.2724	0.0352	29.2335	2.5354	0.9135	26.6981	3.4490	0.7029	0.2533	0.9562
	0.2724	0.0267	0.0085	0.2457	0.0352	26.6981	2.6146	0.8343	24.0835	3.4490	0.7249	0.2313	0.9562
8	0.3477	0.1020	0.0388	0.2457	0.1408	34.0762	9.9927	3.8031	24.0835	13.7958	2.7704	1.0544	3.8248
	0.2457	0.0275	0.0077	0.2182	0.0352	24.0835	2.6964	0.7526	21.3871	3.4490	0.7475	0.2087	0.9562
	0.2182	0.0284	0.0068	0.1899	0.0352	21.3871	2.7806	0.6683	18.6065	3.4490	0.7709	0.1853	0.9562
	0.1899	0.0293	0.0059	0.1606	0.0352	18.6065	2.8675	0.5815	15.7390	3.4490	0.7950	0.1612	0.9562
	0.1606	0.0302	0.0050	0.1304	0.0352	15.7390	2.9571	0.4918	12.7819	3.4490	0.8198	0.1364	0.9562
9	0.2457	0.1153	0.0255	0.1304	0.1408	24.0835	11.3016	2.4943	12.7819	13.7958	3.1333	0.6915	3.8248
	0.1304	0.0311	0.0041	0.0993	0.0352	12.7819	3.0495	0.3994	9.7324	3.4490	0.8455	0.1107	0.9562
	0.0993	0.0321	0.0031	0.0672	0.0352	9.7324	3.1448	0.3041	6.5875	3.4490	0.8719	0.0843	0.9562
	0.0672	0.0331	0.0021	0.0341	0.0352	6.5875	3.2431	0.2059	3.3444	3.4490	0.8991	0.0571	0.9562
	0.0341	0.0341	0.0011	(0.0000)	0.0352	3.3444	3.3444	0.1045	0.0000	3.4490	0.9272	0.0290	0.9562
10	0.1304	0.1304	0.0103	(0.0000)	0.1408	12.7819	12.7819	1.0139	0.0000	13.7958	3.5437	0.2841	3.8248

