National Electric Power Regulatory Authority
Islamic Republic of Pakistan

Registrar

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No. NEPRA/TRF-UTB-2017/18490-18492
November 10, 2017

Subject: **Determination of the Authority regarding Upfront Tariff 2017 for New Bagasse Based Cogeneration Power Projects**

Dear Sir,

Please find enclosed herewith the subject Determination of the Authority along with Annex-I, II, III & IV (23 pages).

2. The Determination is being intimated to the Federal Government for the purpose of notification in the official gazette pursuant to Section 31(4) of the Regulation of Generation, Transmission and Distribution of Electric Power Act (XL of 1997).

3. The Order along with Annex-I, II, III & IV of the Authority's Determination are to be notified in the official Gazette.

Enclosure: As above

10 11 17
(Syed Safeer Hussain)

Secretary
Ministry of Energy
'A' Block, Pak Secretariat
Islamabad

CC:

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

DETERMINATION OF THE AUTHORITY REGARDING UPFRONT TARIFF, 2017 FOR NEW BAGASSE BASED COGENERATION POWER PROJECTS

1. National Electric Power Regulatory Authority (hereinafter referred to as "NEPRA/ the Authority") approved Upfront Tariff for Bagasse Cogeneration Power Projects ("upfront tariff, 2013") based on high pressure boilers (60 bars and above) vide its determination dated May 29, 2013. Upfront tariff, 2013 was determined in pursuance of decision of Council of Common Interest ("CCI") in its meeting in case No. CCI./3/2012 dated November 08, 2012 and subsequent amendment/modification in the Government of Pakistan ("GOP") Policy for Renewable Energy, 2006 through Framework for Power Cogeneration 2013 (bagasse/biomass) ("framework, 2013") approved by Economic Coordination Committee ("ECC") on March 06, 2013.

2. Initially, the applicability period of the upfront tariff, 2013 was 365 days from the date of the determination of the Authority. Subsequently, the applicability period of the said tariff was extended through Authority's decision dated June 19, 2014 for one year and then again on June 17, 2015 for another two years, i.e. till May 28, 2017. Upfront tariff, 2013 has been approved by the Authority for twenty seven bagasse cogeneration projects having cumulative capacity of around 940 MW.

3. To provide consistent tariff regime for the development of bagasse cogeneration power, the Authority in exercise of its powers under its framework decided to initiate suo moto proceedings for determination of new upfront tariff. Accordingly a draft tariff proposal was developed on the basis of data and information available with the Authority. In line with the tariff setting process envisaged in Upfront Tariff (Approval and Procedure) Regulations, 2011 ("Regulations") and with a view to arrive at a just and informed decision, the Authority decided to hold a hearing. Notice of public hearing and salient features of the draft upfront tariff proposal were published in the national newspapers on March 18, 2017 inviting filing of intervention requests and comments. The Authority also issued separate notices to various relevant stakeholders for filing their comments, if any, on the draft tariff proposal and its underlying terms and conditions. The advertised tariff is tabulated below:

TARIFF	Rs./kWh
For First 10 Years	9.9985
For 11-30 Years	7.4053
Levelized Tariff 1-30 Years	9.0956

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4. Following is the list of issues that were approved and uploaded on NEPRA's website for discussion during the hearing:

- Whether the proposed project cost of US$ 1.0339 Million per MW is reasonable?
- Whether the proposed annual plant factor of 60% is reasonable?
- Whether the proposed debt-equity structure of 75:25 is reasonable?
- Whether the proposed Internal Rate of Return ("IRR") of 15% is reasonable?
- Whether the proposed Net Electrical Efficiency of 28.4% is reasonable?
- Whether the proposed fuel pricing mechanism whereby the price of bagasse has been linked with the price of imported coal (CIF Karachi) is fair?
- Whether the proposed working capital cost is justified?
- Whether the proposed floor price of bagasse at Rs. 3,065.20/Ton is fair?
- Whether the proposed minimum escalation of 2% per annum and maximum escalation cap of 5% per annum for bagasse fuel price is fair?

5. In response to the notice of public hearing, three parties including JDW Sugar Mills ("JDW"), DESCON Engineering and Anwar Kamal Law Associates ("AKLA") filed the intervention requests which were approved by the Authority. In addition, comments in writing were submitted by Hyderabad Electric Supply Company (HESCO), Mr. Saqib Shahzad, MR. Azhar Ali, Central Power Purchasing Agency Guarantee Limited ("CPPA-G"), Pakistan Sugar Mills Association Islamabad (PSMA, Islamabad), Pakistan Sugar Mills Association, Sindh (PSMA, Sindh) and Etihad Power Generation Limited (EPGL).

6. Public hearing in this regard was held on April 06, 2017 at NEPRA Tower, Islamabad, which was attended by Alternative Energy Development Board ("AEDB"), project developers, manufacturers, and various other stakeholders.

Discussions, Analysis and Determination of the Authority

7. The discussion on the framed issues and other parameters of the proposal along with the submissions of interveners/ commentators thereon is as follows:

7.1 **Project Cost and Efficiency**

7.1.1 These two issues have been clubbed together as both parameters are directly associated to each other, i.e. higher investment in terms of Engineering Procurement and Construction ("EPC")/project cost results in better performance. NEPRA proposed the project cost of USD

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1.0339 Mill/ MW and corresponding net efficiency of 28.37% while specifying that 100 bar and above boiler technology shall be installed by the projects opting this upfront tariff.

7.1.2 JDW submitted that proposed parameters of project cost and efficiency need to be rationalized. EPGL requested the Authority to increase the project cost as only the EPC cost of its power project comes out to be around USD 1.2 million per MW. PSMA, Islamabad and Mr. Saqib Shahzad submitted that EPC cost has been increased by 7.5% which should have been increased to at least 20% for the proposed 100 bars above technology. PSMA, Islamabad suggested to set the efficiency as weighted average of season and off-season efficiencies. Mr. Azhar submitted that efficiency of 28.4% is difficult to achieve during crushing season due to extraction of steam for the sugar processing.

7.1.3 The Authority has considered the submissions of the interveners and commentators and is of the view that cost of any particular project based on a certain technology cannot be considered as reference for upfront tariff. The upfront tariff regime is developed on the basis of standard project cost and efficiency along with certain terms and conditions. Nevertheless, the EPC cost, corresponding project cost and efficiency being allowed in the neighboring and other countries have been analyzed. The data related to estimated figures of project cost and efficiency being submitted by earlier projects with their license applications has also been examined. Based on the above consideration, the Authority is of the view that the proposed parameters of EPC cost (USD 0.8720 million per MW) and efficiency (28.37% net) are reasonable and has decided to maintain the same for this upfront tariff.

7.1.4 However, the Authority has decided to rationalize the other components of the project cost in view of the benchmarks recently allowed to the comparable projects. The insurance during construction has been reduced to 0.5% of the EPC against 1% proposed in the advertisement. Further, the calculations of interest during construction have been made on interest rates being offered under the refinancing scheme of State Bank of Pakistan ("SBP') (details are given in the produced below relevant issue). Making the said changes, the approved project cost works out to be around USD 0.9966 million per MW against the proposed project cost of USD 1.0339 million per MW which is hereby approved for this upfront tariff.

7.1.5 In addition, the Authority has also decided to remove the requirement of setting up power projects on 100 bars and above technology under this upfront tariff. This shall now be the decision of the project developers while keeping in view the requirement specified in framework, 2013.

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7.2 Plant Factor

7.2.1 For upfront tariff, 2013, the Authority approved a plant factor of 45% whereas for new upfront tariff, the plant factor of 60% was proposed. Regarding the proposal, JDW, AEDB, Mr. Azhar Ali, PSMA Sindh and PSMA Centre submitted that 60% plant factor is not attainable whereas HESCO, CPPA-G and AKLA supported the proposed plant factor. JDW requested to allow a plant factor of 45% by stating that higher plant factor is only achievable by improvement in steam economy which requires significant investment which is not allowed in tariff. Even with best steam economy, a bagasse plant can only achieve 45% plant factor based on bagasse available in house. JDW further submitted that like hydro power plants, the resource risk in bagasse is very high and suggested that the full downside and the upside of the plant factor should remain with the power producer. PSMA, Islamabad and Mr. Azhar Ali submitted that once sizeable capacity come online, lesser availability of outsourced bagasse would render it impossible for the projects to achieve the plant factor of 60%. AEDB submitted that proposed plant factor can be achieved by a crushing season of 180 days which in Pakistan lasts for 110-130 days (an average of 120 days), therefore, the same should be revised downward. PSMA, Sindh submitted that a plant factor of 60% is not achievable and proposed to use plant factor of 45% for the tariff. HESCO submitted that a plant factor of 95% should be considered as bagasse is a storable item. CPPA-G submitted that proposed plant factor is achievable by right sizing the power plants and that only variable cost components of the tariff should be paid for the energy beyond targeted plant factor.

7.2.2 The Authority is of the view that this upfront tariff is being set on relatively higher efficiency which shall contribute to more savings in bagasse. The Authority also noted that that the prospective projects are allowed operations using other biomass fuels like cotton straw, wheat stalk and rice husk etc. which may also augment the plant factor. The crushing season data and the views of interveners/ commentators that upcoming bagasse based power plants shall result in scarcity of bagasse were also given due consideration. Considering the above points, the Authority has decided to set this upfront tariff at plant factor of 55% as against the proposed figure of 60%. The applicable upfront tariff shall be applied on all the electricity units.

7.3 Debt : Equity Structure

7.3.1 Upfront tariff, 2013 was computed on the basis of a debt to equity ratio of 80:20. However, the said ratio was changed to 75:25 in the proposed upfront tariff. The Authority during the post hearing processing of the case observed that the debt to equity ratio of 80:20 has been allowed in recent tariff cases of comparable projects. Therefore, the Authority has decided to optimize the debt to equity ratio for this upfront tariff at 80:20.

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7.4 **Internal Rate of Return ("IRR")**

7.4.1 The Authority approved the upfront tariff, 2013 while allowing an IRR of 17% whereas an IRR of 15% was proposed for new upfront tariff. Majority of the Interveners and commentators opposed the said decrease in return. The Authority noted that the return of any project is linked with its risks. A relatively higher IRR in the earlier upfront tariff was allowed to incentivize the early entrants. Now, with a number of projects been awarded previous upfront tariff, the Authority understands that returns should be revised downwards to match the reduction in the risk profile. Therefore, the Authority has decided to allow the 15% return on equity for this tariff.

7.5 **Cost of Debt**

7.5.1 The Authority noted that SBP in June, 2016 had approved financing scheme for renewable power projects including bagasse cogeneration power projects. Under that scheme, SBP is providing loan at a flat rate of 6% for a debt servicing term of ten (10) years. In view of the favourable terms being offered under the SBP scheme, the Authority has decided that bagasse power projects opting this upfront tariff shall secure financing under the said SBP scheme. The project cost and reference tariff being approved vide this determination have also been computed on the interest rates being offered under the SBP scheme. This upfront tariff shall be approved/adjusted for the projects on commercial financing terms (explained in following paragraphs) only after the option of financing under SBP scheme is exhausted which shall be substantiated with submission of relevant documentary evidences at the time of application of this upfront tariff.

7.5.2 Regarding commercial financing, upfront tariff, 2013 and proposed tariff were worked out using KIBOR plus 3% premium. The Authority has noted that relatively lower premiums have been allowed in the recently approved tariffs of other comparable technologies. Further, it has been observed that a number of independent power projects have secured local financing on quite lower premiums compared to 3%. The Authority also considered that bagasse projects are being setup on already established businesses and therefore can obtain financing on terms better than independent power projects. Considering all above factors, the Authority has decided that this tariff shall be approved at commercial financing terms of KIBOR plus margin of 1.75%. The savings in the spread, if any, shall be shared between power purchaser and power producer in the ratio of 60:40.

7.5.3 A number of commentators/interveners also requested that this upfront tariff should have the provision for foreign financing. They submitted that provision of foreign financing has become more important as SBP has recently mandated to lenders that at least 50% of the foreign

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exchange component of the power plants must be financed by such projects through foreign currency. The Authority noted that the upfront tariffs of other technologies have been allowed the provision of foreign financing and has decided to allow the said provision in this upfront tariff as well. The terms of foreign financing shall be based on three months LIBOR plus spread of 4.25%.

7.6 **Fuel Pricing and Indexation Mechanism**

7.6.1 The Authority determined price of Bagasse at Rs. 2,860.80/ ton in upfront tariff, 2013 on the basis of which Fuel Cost Component ("FCC") of Rs. 5.7702/ kWh was approved. The said price of bagasse was calculated using Cost, Insurance and Freight ("CIF") price of South African coal and net calorific values of 6,905 Btus/kg and 23,810 Btus/kg for bagasse and South African coal respectively. The indexation/ adjustment mechanism for FCC was also approved in upfront tariff, 2013. Under the said mechanism, FCC was subjected to adjustment on the basis of variations in CIF price of South African coal and exchange rate variations annually with a floor coal price set at USD 100.67/ ton.

7.6.2 The bagasse price of Rs. 3,067/ ton and a FCC of Rs. 5.3399/ kWh was proposed in the advertisement for new upfront tariff. The aforementioned bagasse price and FCC were computed using efficiency of 28.37% while applying the same formula used in upfront tariff, 2013 determination. However, the adjustment mechanism of FCC was changed and it was proposed that the floor of bagasse price be determined in PKR instead of USD, with minimum escalation of 2% per annum and maximum escalation cap of 5% per annum in PKR terms.

7.6.3 JDW submitted that it has no objections to the proposed mechanism for the indexation of the FCC. PSMA (Sindh Zone) supported the same treatment of FCC adjustment as was approved in upfront tariff, 2013. CPPA-G submitted that FCC should not be linked and indexed with the imported coal as Bagasse is an indigenous resource and requested the Authority to initiate separate proceedings to devise pricing and mechanism for adjustment of FCC. Ministry of Water and Power (MoW&P) vide its letter dated June 05, 2017 submitted that the adjustment of FCC should not be linked with the coal and a stand- alone mechanism need to be evolved.

7.6.4 The Authority noted that earlier approved mechanism has resulted in the increase in bagasse prices due to change in exchange rate parity without the increase of coal prices beyond the specified floor. The Authority agrees with the submission of CPPA-G and MoW&P that prices of indigenous fuel like bagasse should not be continued to be linked with prices of alternative fuels

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denominated in foreign currency. The Authority also noted that it has been asking the relevant entities to suggest a mechanism for the determination and indexation of bagasse prices; however, no input has been received so far. Apart from the relating this fuel with the alternatives, the other methodologies to determine the prices and indexation of bagasse were deliberated upon. The Authority understands that methodology of price setting and corresponding indexation should be such which results in rationalized price of bagasse, protects against the heavy fluctuations of alternative fuel prices and provides certainty to the investors. For that purpose, one of the methods that came under discussion was to derive price of bagasse from sugarcane prices. However, the Authority feels that setting prices based on quantity of bagasse obtained from sugarcane may not be fully reflective of its value. Another method of determining price of bagasse based on its market prices was thoroughly discussed. It was noted that few of the commentators/project developers in the hearing submitted that bagasse is traded at the rate of Rs. 3,500-4,500 per ton during off season. Further, it has been found that bagasse is traded in the range of Rs. 1,500 to Rs. 2,500 per ton during season. Taking into account the number of season and off-season days of the approved plant factor, the aforesaid data can yield bagasse prices roughly in the range of Rs. 2,500 to 3,000 per ton depending upon the supply and demand position, length of the crushing season in a particular year and other factors. It is also worth emphasizing here the fact that bagasse is only a by-product and has to be used primarily for the processing of sugar in the mills. In view of all the above discussions, the Authority has decided to approve bagasse price of Rs. 2,750 per ton for the determination of this upfront tariff which has been computed using the information about market prices. Further, the Authority has decided that the price of bagasse shall be allowed increase of 2% flat after every two years and the corresponding fuel component of tariff shall be adjusted accordingly.

7.7 **Working Capital Component**

7.7.1 The Authority approved working capital cost component of Rs. 0.1924/kWh in the upfront tariff, 2013 to cover the time lag in receipts and payments. On the same lines, a working capital component of Rs. 0.1236/kW was proposed for new upfront tariff. The Authority during the post hearing processing of the case observed that working capital component has been allowed in the tariffs for those technologies where fuel payments are made in advance. On contrary, the power projects based on natural gas have not been allowed working capital component as the fuel payments are not made upfront. Similarly, wind and solar power projects have also not been allowed this component in their tariffs. The Authority is of the view that the principle of upfront fuel payment is not applied on bagasse as the same is only a leftover which is coming out of sugar mills operations. In view thereof, the Authority has decided not to allow this component in this upfront tariff.

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7.8 **Operation and Maintenance Cost**

7.8.1 The Authority allowed O&M cost of USD 0.0264 million per MW per annum i.e. 3.25% of the allowed EPC cost for upfront tariff, 2013. The total O&M cost per annum was bifurcated into fixed and variable component in proportion of 60% and 40% respectively. The variable O&M was further bifurcated in to cost 75% foreign component and 25% local component with relevant indexations thereon. For the proposal of the new upfront tariff, the indexed figures as allowed in upfront tariff, 2013 were advertised. The total O&M cost of Rs. 0.8275/kWh was proposed comprising of Rs. 0.4858/kWh of variable O&M and Rs. 0.3417/kWh of fixed O&M. The Authority during the post hearing processing of the case observed that this upfront tariff is being developed on relatively higher efficiency and plant factor that result in lower O&M cost and the proposed indexed figure does not take into account these factors. Hence, the Authority has decided to rework the proposed O&M cost on the same basis as was applied in upfront tariff, 2013. It has been noted that generally the captioned cost is allowed in the range of 3% to 4% of the allowed EPC. As insurance during operation is being allowed separately in this upfront tariff, therefore, the Authority has decided to allow this cost at 3% of the EPC cost. The allowed amount works out to be USD. 0.0261 million per MW per annum and the corresponding tariff component works out to be Rs. 0.6231/kWh. While referring the O&M cost allowed in comparable projects, the O&M cost has been bifurcated into Rs. 0.2492/kWh of variable O&M and Rs. 0.3738/kWh of fixed O&M. Further, the variable O&M has been divided into Rs. 0.0997//kWh and Rs. 0.1495/kWh for local and foreign components.

7.9 **Withholding Tax**

7.9.1 The Authority had allowed withholding tax on dividend at the rate of 7.5% as a pass through cost in Upfront Tariff, 2013. However, for the new tariff, withholding tax on dividends was not taken into account. The Authority has noted that it has principally decided not to allow this component in the tariffs of all the technologies and segments and the same has been disallowed for this tariff.

7.10 **Auxiliary Consumption**

7.10.1 The Authority allowed an auxiliary consumption of 8.5% in upfront tariff, 2013 and same has been used for the working of this tariff.

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7.11 **Insurance during Operation**

7.11.1 Similar to the treatment of insurance during construction, the insurance during operation has been computed at 0.5% of the allowed EPC cost.

7.12 **Financial Close, Construction Period and Tariff Applicability Period**

7.12.1 In the upfront tariff, 2013, the Authority allowed construction period of twenty (20) months from the date of financial close and the projects were required to achieve Commercial Operation Date (COD) in 24 months from the date of tariff approval by NEPRA. In the proposal for new upfront tariff, the Authority maintained the aforesaid conditions. Few of the parties submitted that the proposed construction period of twenty months is too tight and suggested to increase the same to 24 months. Further, they submitted that starting point of construction should be linked with financial close instead of award of tariff. The Authority has referred the time of financial close and construction being allowed in other technologies. The Authority also considered the size of the plants being setup under upfront tariff, 2013. Considering these factors, the Authority has decided to allow financial close time of six months from the date of approval of tariff and construction period of eighteen months from the date of financial close for this upfront tariff. The applicability period of this tariff shall be one year from the date of issuance of this tariff.

7.13 **Power Evacuation Scheme**

7.13.1 In the framework, 2013, it was made mandatory for the power purchaser to evacuate power from these power projects. In the upfront tariff, 2013 NEPRA decided that all the energy offered by these projects shall be purchased on priority basis. Under the Energy Purchase Agreement ("EPA") signed between power purchaser and a number of bagasse projects, tariff payments have been linked with the available capacity. During the crushing season, total tariff comprising of variable energy charges (including fuel) and fixed energy charges are paid based on equivalent units of capacity made available by the power producers. During off-season, only fixed energy payments are made by the power purchaser based on the available capacity.

7.13.2 CPPA-G commented during the hearing and in writing that Take or Pay arrangement in the EPA needs to be changed. AKLA also opposed the Take or pay arrangement of these generation facilities. In this regard, CPPA-G informed the Authority that it has also approached the MoW&P for the change in the must-run feature of the policy. CPPA-G further submitted that purchasing power from bagasse based power projects under must run mode will cause the under-utilization of conventional power sources with obligatory fixed payments which resultantly will increase the

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fixed cost component of the consumer end tariff. CPPA-G submitted that it feels that the renewable energy including bagasse should be inducted into the system based on power acquisition program. CPPA-G submitted that DISCOs may be mandated to include certain quantum of renewables to procure in the future. This shall automatically make it take or pay arrangement; however, that plan shall be more pragmatic and help CPPA-G in bringing competition in power market. It has been noted that for the last twelve tariff applications under the previous upfront tariff, CPPA-G issued the consent letter stating that it will procure power on priority basis during season. However, during the off-season, it shall give dispatch to those power stations keeping in view the economic merit order.

7.13.3 The Authority has noted that it has approved tariffs for the bagasse captive projects on "take and pay" or "units delivered" basis. However, upfront tariff, 2013 tariff was approved on priority dispatch basis in view of the framework, 2013. Through this arrangement, the sugar mills were encouraged to invest money for efficient power operations in return of reasonable profits and guarantees for payments of all the energy available to them. The Authority is of the view that the upfront tariff is developed based on standard cost and performance while shifting the onus of resource risk to the power producer. It has also been observed that there are a number of countries where the power is being evacuated from these sources on priority dispatch basis. The Authority also considered that this technology provides environmental friendly base load power and helps reduce the dependence on fossil fuels. The elements of indigenous fuel, local currency based tariff and savings on the foreign currency outflow from the country were also given due deliberations. Considering all these points and keeping in view the evacuation arrangement given in framework, 2013, the Authority has decided to continue the arrangement of priority dispatch for this upfront tariff, however, to the extent of specified plant factor. The available energy after the attainment of set plant factor shall be procured as per the principles of economic despatch.

7.13.4 In addition, the Authority is of the view that terms signed in the EPA under the previous upfront tariff were not balanced as the payments of fuel were being made without the dispatch of energy. The Authority understands that bagasse is a controllable source; therefore, the payments of variable component of this tariff including fuel shall only be made by the power purchaser on the basis of units dispatched. Further, the Authority is of the view that EPA signed under this upfront tariff shall also include the mechanism of penalty on power producers for deviations from their declared available capacity.

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Order

8. The Authority hereby determines and approves the following Upfront Tariff for New Bagasse based Cogeneration projects for delivery of electricity to the power purchaser,

Description	Bagasse Upfront Tariff, 2017		Indexation
	1-10 years Rs/ kWh	**11-30 years Rs/ kWh**	
Fuel Cost	4.7900	4.7900	2% escalation in Bagasse price after every two years
Variable O&M Local	0.0997	0.0997	CPI General
Variable O&M Foreign	0.1495	0.1495	US CPI & PKR/USD
Fixed O&M	0.3739	0.3739	CPI General
Insurance	0.1039	0.1039	PKR/USD
Debt Service	2.5390	-	LIBOR/KIBOR & PKR/USD (if applicable)
Return on Equity	0.8022	0.8022	PKR/USD
Total	**8.8582**	**6.3191**	

i. The above reference tariff is applicable for 30 years from COD.

ii. The above tariff is applicable for new Cogeneration projects based on bagasse.

iii. The reference component wise Upfront Tariff table is attached herewith as Annex-I

iv. The reference Debt Service schedule is attached herewith as Annex-II.

v. This upfront tariff has been worked out on the basis of the interest rate of 6% being offered under SBP scheme. In case of commercial local financing, the tariff shall be computed using applicable KIBOR plus a premium of 175 basis points. In case of commercial foreign financing, the tariff shall be computed using applicable LIBOR plus a premium of 425 basis points. In case negotiated rates/spread is less than the said limits, the savings shall be shared by the power purchaser and the power producer in the ratio of 60:40 respectively. The power producer shall submit relevant authentic documentary evidence to the Authority, for the aforesaid adjustment within 15 days of COD of the relevant company. In case the premium on LIBOR/KIBOR is higher than that mentioned above, no adjustment on the basis of actual higher premium will be allowed.

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vi. The principal amount of local financing for quarter 1 will be adjusted for exchange rate variation, for 270 days after financial close of the relevant company, in accordance with the onetime adjustment mechanism stipulated below:

B(LFIN) = (B(LREF) x 50%) + (B(LREF) x 50% x ER(REV) / ER(REF))

Where:

B(LFIN)	=	The revised base amount for the first quarter after allowing onetime adjustment for exchange rate parity
B(LREF)	=	The reference base amount for the first quarter
ER(REV)	=	The average, for a period of 270 days after financial close, of TT & OD selling rate of US dollar as notified by the National Bank of Pakistan
ER(REF)	=	Reference TT & OD selling rate of US dollar i.e. 105

vii. The interest during construction shall be adjusted at the time of COD on account of actual project financing mix and variation in quarterly LIBOR/KIBOR (where applicable) over the approved reference rates. The interest during construction shall be reassessed for the allowed construction period of eighteen months, starting from the date of financial close of the relevant company, on the same computation basis as already adopted, by applying 3 months KIBOR/LIBOR of last day of the preceding quarter (plus allowed spread thereon), on the basis of phasing for debt injection considered in the computation of upfront tariff. The power producer shall submit relevant authentic documentary evidence to the Authority, for the aforesaid adjustment within fifteen days of the COD of the relevant company.

viii. <u>Pass Through Items</u>

a) 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.

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b) 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.

c) Withholding tax on dividends will not be allowed as a pass through item.

ix. Indexation and Adjustment: Following indexation shall be applicable to the reference tariff after one-time adjustment:

a) Fuel Cost Component: The fuel cost component of tariff will be adjusted on account of increase in price of fuel (bagasse) at 2% after every two years in advance (w.e.f. 1st of July of each applicable year) as per the formula given hereunder:

$FCC_{(REV)}$	=	$FCC_{(REF)} * BP_{(REV)} / BP_{(REF)}$
Where:		
$FCC_{(REV)}$	=	Revised fuel cost component of tariff for the applicable period.
$FCC_{(REF)}$	=	Reference fuel cost component of tariff.
$BP_{(REF)}$	=	Reference price of Bagasse, i.e. the price in Rs./ton for the period immediately preceding the applicable period .
$BP_{(REV)}$	=	Revised price of bagasse in Rs/ton which shall be worked out as BP(REV)= BP(REF)+2%*BP(REF)

b) Fixed O&M: The fixed O&M component will be adjusted on account of local Inflation. Quarterly adjustments for inflation 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). The formula of indexation will be as under:

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F. $O\&M_{(REV)}$	=	F. O&M $_{(REF)}$ * CPI $_{(REV)}$ / CPI $_{(REF)}$
Where:		
F. $O\&M_{(REV)}$	=	The revised Fixed O&M component of tariff
L F. $O\&M_{(REF)}$	=	The reference Fixed O&M component of tariff
$CPI_{(REV)}$	=	The applicable revised CPI (General)
$CPI_{(REF)}$	=	The reference CPI (General) of 216.61 for the month of August, 2017

c) Variable O&M-Local: The local variable O&M component will be adjusted on account of local Inflation. Quarterly adjustments for inflation 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). The formula of indexation will be as under:

L V. $O\&M_{(REV)}$	=	L V. O&M $_{(REF)}$ * CPI $_{(REV)}$ / CPI $_{(REF)}$
Where:		
L V. $O\&M_{(REV)}$	=	The revised local variable O&M component of tariff
L V. $O\&M_{(REF)}$	=	The reference local variable O&M component of tariff
$CPI_{(REV)}$	=	The applicable revised CPI (General)
$CPI_{(REF)}$	=	The reference CPI (General) of 216.61 for the month of August 2017

d) Variable O&M-Foreign: The foreign variable 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 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 formula of indexation will be as under:

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F V. $O\&M_{(REV)}$	=	F V. $O\&M_{(REF)}$ * US $CPI_{(REV)}$ / US $CPI_{(REF)}$ * $ER_{(REV)}/ER_{(REF)}$
Where:		
F V. $O\&M_{(REV)}$	=	The revised foreign variable O&M component of tariff
F V. $O\&M_{(REF)}$	=	The revised foreign variable O&M component of tariff
US $CPI_{(REV)}$	=	The revised US CPI (All Urban Consumers)
US $CPI_{(REF)}$	=	The reference US CPI (All Urban Consumers) of 245.519 for the month of August, 2017
$ER_{(REV)}$	=	The revised TT & OD selling rate of US dollar
$ER_{(REF)}$	=	The reference TT & OD selling rate of RS. 105/USD

e) <u>Adjustment of debt servicing component</u>: This fixed charge component after one-time adjustment will remain unchanged throughout the tariff control period except for the adjustment due to variation in LIBOR/KIBOR in case of foreign/local commercial financing. The debt servicing component of tariff will be adjusted accordingly on quarterly basis.

f) <u>Return on Equity</u>: 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:

$ROE_{(Rev)}$	=	$ROE_{(Ref)}$ * $ER_{(Rev)}/ ER_{(Ref)}$
Where;		
$ROE_{(Rev)}$	=	Revised ROE Component of Tariff
$ROE_{(Ref)}$	=	Reference ROE Component of Tariff
$ER_{(Rev)}$	=	The revised TT & OD selling rate of US dollar as notified by the National Bank of Pakistan
$ER_{(Ref)}$	=	The reference TT & OD selling rate of Rs. 105/USD

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g) Insurance during Operation: The actual insurance cost for the minimum cover required under contractual obligations with the Power Purchaser, not exceeding 0.5% of the EPC cost, will be treated as pass through. Insurance component of reference tariff shall be adjusted annually as per actual upon production of authentic documentary evidence according to the following formula;

AIC	=	$Ins_{(Ref)} / P_{(Ref)} * P_{(Act)}$
Where		
AIC	=	Adjusted insurance component of tariff
$Ins_{(Ref)}$	=	Reference insurance component of tariff
$P_{(Ref)}$	=	Reference premium @ 0.5% of EPC Cost at Rs. 105
$P_{(Act)}$	=	Actual premium or 0.5% of the EPC Cost converted into Pak Rupees on exchange rate prevailing on the 1st day of the insurance coverage period whichever is lower

x. Terms and Conditions: The following terms and conditions will be applicable for cogeneration projects who opt for Upfront Tariff,

a) The upfront tariff will be applicable for all new cogeneration projects using bagasse along with other biomass.

b) Cogeneration projects meeting the following conditions will be eligible for this tariff:

- Companies recommended by the AEDB/relevant agencies for the grant of Upfront Tariff.
- Companies which certify that all the plant and machinery to be installed will be new and of international standards in the format attached as Annex-III.
- Companies who have the consent certificate of the power purchaser for procurement of electricity as per the format attached as Annex-IV.

c) There is no maximum or minimum cap for the installed capacity by cogeneration projects.

d) The option for accepting upfront tariff by cogeneration projects will be applicable for one year (365 days) from the date of approval of upfront tariff by the Authority.

e) The decision to opt for upfront tariff once exercised will be irrevocable.

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f) The companies opting for this tariff will have to achieve financial close within six months from the date of decision of the Authority awarding upfront tariff to them. The upfront tariff granted to any company will no longer remain applicable/valid, if financial close is not achieved by the relevant company in the abovementioned timeline or a generation license is declined to that company.

g) The targeted maximum construction period after financial close is 18 months. No adjustment will be allowed in this tariff to account for financial impact of any delay in project construction. However, the failure of a project to complete construction within 18 months of financial close will not invalidate the tariff granted to it.

h) The projects 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.

i) The projects opting this tariff shall secure debt under the concessionary financing scheme of State Bank of Pakistan. This tariff shall be allowed on the approved terms of commercial financing only after availing the option of financing under SBP scheme.

j) All energy offered for sale by the cogeneration projects, to the extent of approved plant factor, shall be taken by the power purchaser on priority basis. The energy offered beyond set plant factor shall be procured as per the principles of economic dispatch.

k) Variable component of tariff including fuel shall not be paid for the energy not dispatched by the power purchaser both during season and off-season.

l) The EPA shall state the mechanism of penalty to power producer in case the power producer does not fulfil its commitment of making the declared capacity available during season and off season.

m) 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/NTDC at 132 KV, provided that the cost of interconnection, grid station upgrades etc. for power evacuation shall be incurred by the respective DISCO/NTDCL.

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n) In this 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.

o) The cogeneration 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.

p) 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.

q) 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. No project specific adjustments shall be taken in account.

r) The EPA/ PPA executed shall be consistent with all applicable documents including Generation License and NEPRA's Tariff determination for the power producer. Any provision of PPA/ EPA which is inconsistent with NEPRA's Tariff Determination shall be void to that extent and its financial impact shall not be passed on to the end consumer.

s) The terms and conditions specified herein form an integral part of this tariff.

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9. The above order of the Authority, along with attached annexures (I to IV), are recommended for notification by the Federal Government, in the Official Gazette, in accordance with Section 31(4) of the Regulation of Generation, Transmission and Distribution of Electric Power Act, 1997.

AUTHORITY

(Himayat Ullah Khan)
Member

(Maj (R) Haroon Rashid)
Member

10/11

(Syed Masood-ul-Hassan Naqvi)
Member

10/11

(Saif Ullah Chattha)
Vice Chairman

(Brig (R) Tariq Saddozai)
Chairman

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UPFRONT REFERENCE TARIFF FOR BAGASSE POWER PROJECTS

Year	Fuel Component	Variable O&M Local	Variable O&M Foreign	Fixed O&M Local	Insurance	Return on Equity	Return on Equity during construction	Loan Repayment	Interest Charges	Tariff
	Rs. / kWh	Rs. / kWh	Rs. / kWh	Rs. / kWh	Rs. / kWh	Rs. / kWh	Rs. / kWh	Rs. / kWh	Rs. / kWh	Rs. / kWh
1	4.7900	0.0997	0.1495	0.3739	0.1039	0.7121	0.0901	1.4315	1.1076	8.8582
2	4.7900	0.0997	0.1495	0.3739	0.1039	0.7121	0.0901	1.5193	1.0197	8.8582
3	4.7900	0.0997	0.1495	0.3739	0.1039	0.7121	0.0901	1.6126	0.9265	8.8582
4	4.7900	0.0997	0.1495	0.3739	0.1039	0.7121	0.0901	1.7115	0.8275	8.8582
5	4.7900	0.0997	0.1495	0.3739	0.1039	0.7121	0.0901	1.8165	0.7225	8.8582
6	4.7900	0.0997	0.1495	0.3739	0.1039	0.7121	0.0901	1.9280	0.6110	8.8582
7	4.7900	0.0997	0.1495	0.3739	0.1039	0.7121	0.0901	2.0463	0.4927	8.8582
8	4.7900	0.0997	0.1495	0.3739	0.1039	0.7121	0.0901	2.1719	0.3672	8.8582
9	4.7900	0.0997	0.1495	0.3739	0.1039	0.7121	0.0901	2.3052	0.2339	8.8582
10	4.7900	0.0997	0.1495	0.3739	0.1039	0.7121	0.0901	2.4466	0.0924	8.8582
11	4.7900	0.0997	0.1495	0.3739	0.1039	0.7121	0.0901	-	-	6.3191
12	4.7900	0.0997	0.1495	0.3739	0.1039	0.7121	0.0901	-	-	6.3191
13	4.7900	0.0997	0.1495	0.3739	0.1039	0.7121	0.0901	-	-	6.3191
14	4.7900	0.0997	0.1495	0.3739	0.1039	0.7121	0.0901	-	-	6.3191
15	4.7900	0.0997	0.1495	0.3739	0.1039	0.7121	0.0901	-	-	6.3191
16	4.7900	0.0997	0.1495	0.3739	0.1039	0.7121	0.0901	-	-	6.3191
17	4.7900	0.0997	0.1495	0.3739	0.1039	0.7121	0.0901	-	-	6.3191
18	4.7900	0.0997	0.1495	0.3739	0.1039	0.7121	0.0901	-	-	6.3191
19	4.7900	0.0997	0.1495	0.3739	0.1039	0.7121	0.0901	-	-	6.3191
20	4.7900	0.0997	0.1495	0.3739	0.1039	0.7121	0.0901	-	-	6.3191
21	4.7900	0.0997	0.1495	0.3739	0.1039	0.7121	0.0901	-	-	6.3191
22	4.7900	0.0997	0.1495	0.3739	0.1039	0.7121	0.0901	-	-	6.3191
23	4.7900	0.0997	0.1495	0.3739	0.1039	0.7121	0.0901	-	-	6.3191
24	4.7900	0.0997	0.1495	0.3739	0.1039	0.7121	0.0901	-	-	6.3191
25	4.7900	0.0997	0.1495	0.3739	0.1039	0.7121	0.0901	-	-	6.3191
26	4.7900	0.0997	0.1495	0.3739	0.1039	0.7121	0.0901	-	-	6.3191
27	4.7900	0.0997	0.1495	0.3739	0.1039	0.7121	0.0901	-	-	6.3191
28	4.7900	0.0997	0.1495	0.3739	0.1039	0.7121	0.0901	-	-	6.3191
29	4.7900	0.0997	0.1495	0.3739	0.1039	0.7121	0.0901	-	-	6.3191
30	4.7900	0.0997	0.1495	0.3739	0.1039	0.7121	0.0901	-	-	6.3191
Levelized Tariff	4.7900	0.0997	0.1495	0.3739	0.1039	0.7121	0.0901	1.1815	0.4735	7.9741

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Annex-II

UPFRONT REFERENCE TARIFF FOR BAGASSE POWER PROJECTS

Debt Servicing Schedule for the purpose of Indexation of debt component only

Relevant Quarters	Base amount (USD)	Principal Repayment (USD)	Interest (USD)	Balance Principal (USD)	Annual Principal Repayment Rs./kWh	Annual Interest Rs./kWh	Annual Debt Servicing Rs./kWh
1	0.7973	0.0147	0.0120	0.7826	0.3499	1.4315	1.1076
2	0.7826	0.0149	0.0117	0.7677	0.3552		
3	0.7677	0.0151	0.0115	0.7525	0.3605		
4	0.7525	0.0154	0.0113	0.7372	0.3659		
5	0.7372	0.0156	0.0111	0.7216	0.3714	1.5193	1.0197
6	0.7216	0.0158	0.0108	0.7058	0.3770		
7	0.7058	0.0161	0.0106	0.6897	0.3826		
8	0.6897	0.0163	0.0103	0.6734	0.3884		
9	0.6734	0.0165	0.0101	0.6568	0.3942	1.6126	0.9265
10	0.6568	0.0168	0.0099	0.6400	0.4001		
11	0.6400	0.0171	0.0096	0.6230	0.4061		
12	0.6230	0.0173	0.0093	0.6057	0.4122		
13	0.6057	0.0176	0.0091	0.5881	0.4184	1.7115	0.8275
14	0.5881	0.0178	0.0088	0.5703	0.4246		
15	0.5703	0.0181	0.0086	0.5522	0.4310		
16	0.5522	0.0184	0.0083	0.5338	0.4375		
17	0.5338	0.0186	0.0080	0.5152	0.4440	1.8165	0.7225
18	0.5152	0.0189	0.0077	0.4963	0.4507		
19	0.4963	0.0192	0.0074	0.4771	0.4575		
20	0.4771	0.0195	0.0072	0.4576	0.4643		
21	0.4576	0.0198	0.0069	0.4378	0.4713	1.9280	0.6110
22	0.4378	0.0201	0.0066	0.4177	0.4784		
23	0.4177	0.0204	0.0063	0.3973	0.4855		
24	0.3973	0.0207	0.0060	0.3766	0.4928		
25	0.3766	0.0210	0.0056	0.3556	0.5002	2.0463	0.4927
26	0.3556	0.0213	0.0053	0.3343	0.5077		
27	0.3343	0.0216	0.0050	0.3127	0.5153		
28	0.3127	0.0220	0.0047	0.2907	0.5231		
29	0.2907	0.0223	0.0044	0.2684	0.5309	2.1719	0.3672
30	0.2684	0.0226	0.0040	0.2458	0.5389		
31	0.2458	0.0230	0.0037	0.2228	0.5470		
32	0.2228	0.0233	0.0033	0.1995	0.5552		
33	0.1995	0.0237	0.0030	0.1758	0.5635	2.3052	0.2339
34	0.1758	0.0240	0.0026	0.1518	0.5719		
35	0.1518	0.0244	0.0023	0.1275	0.5805		
36	0.1275	0.0247	0.0019	0.1027	0.5892		
37	0.1027	0.0251	0.0015	0.0776	0.5981	2.4466	0.0924
38	0.0776	0.0255	0.0012	0.0521	0.6070		
39	0.0521	0.0259	0.0008	0.0263	0.6161		
40	0.0263	0.0263	0.0004	-	0.6254		

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Annexure - III

Date: __________

The Registrar,
National Electric Power Regulatory Authority,
Islamabad

SUBJECT:-- Certifications in respect of application approval of tariff for bagasse cogeneration project

I, [NAME, DESIGNATION], being the duly Authorized representative of [NAME OF APPLICANT COMPANY] by virtue of [BOARD RESOLUTION/POWER OF ATTORNEY DATED], hereby confirm that for our project of [CAPACITY OF THE PROJECT] MW installed capacity to be located at [ADDRESS OF THE PROJECT SITE]:

1. All the plant and machinery to be installed will be brand new and of international standards.

Signature:__________________

Name: __________________

Designation:__________________

Company Stamp

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[On letter head of power purchaser]

Annexure - IV

Date: __________

The Registrar,
National Electric Power Regulatory Authority,
Islamabad

SUBJECT:-- Consent of Power Purchase

We hereby confirm that necessary arrangements will be in place, to evacuate and absorb power in the national grid, supplied by bagasse cogeneration project of [NAME OF THE COMPANY], having [CAPACITY OF THE PROJECT] MW gross installed capacity to be located at [ADDRESS OF THE PROJECT SITE]. The Authority may accordingly grant upfront tariff to [NAME OF THE COMPANY] for the aforesaid project.

Signature:________________

Name: ________________

Designation:________________

Company Stamp

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