National Electric Power Regulatory Authority

Islamic Republic of Pakistan

nepra

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No. NEPRA/UTH-01/4744-4746
April 2, 2015

Subject: **Determination of National Electric Power Regulatory Authority in the Matter of Upfront Tariff for Small Hydro Power Generation Projects Upto 25 MW <u>Installed Capacity</u>**

Dear Sir,

Please find enclosed herewith the subject Determination of the Authority along with Annex-I, II, III, IV A, IV B, V A, V B, VI A, VI B, VII A, VII B (78 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 Order of the Authority along with Annex-I, II, III, IV A, IV B, V A, V B, VI A, VI B, VII A, VII B of the Determination needs to be notified in the official Gazette.

Enclosure: As above

02.04.15
(Syed Safeer 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.

DETERMINATION OF NATIONAL ELECTRIC POWER REGULATORY AUTHORITY IN THE MATTER OF UPFRONT TARIFF FOR SMALL HYDRO POWER GENERATION PROJECTS UPTO 25 MW INSTALLED CAPACITY

1. National Electric Power Regulatory Authority (hereinafter referred to as the "Authority") was established under section 3 of the 'Regulation of Generation, Transmission and Distribution of Electric Power Act, 1997' (hereinafter referred to as the "Act") and its responsibilities under the Act include, inter alia, determination of tariff, rates, charges and other terms and conditions for supply of electric power services by the generation, transmission and distribution companies. Before approving the tariff for the supply of electric power by generation companies using hydroelectric plants, the Authority is required to consider the recommendations of the Government of the province in which such generation facilities are located. In performing its functions, the Authority has to protect, as far as practicable, the interests of consumers and companies providing electric power services in accordance with the guidelines, not inconsistent with the provisions of the Act laid down by the Federal Government.

2. The Authority keeping in view the advantages of electric power generation from hydro power viz. no supply dependence on imported fuel, material portion of project cost to be expended within Pakistan giving boost to the local economy, long life of hydropower projects, etc. decided to facilitate and galvanize the development of small hydro power generation projects. Hence, the Authority in exercise of its powers under the Act, read with Rule 3 (1) of the National Electric Power Regulatory Authority (Tariff Standards and Procedure) Rules, 1998 (hereinafter referred to as the "tariff rules") and Regulation 3 of the National Electric Power Regulatory Authority Upfront Tariff (Approval & Procedure) Regulations, 2011 (hereinafter referred to as the "upfront tariff regulations") initiated proceedings for the development and determination of upfront tariff for generation of electricity from small hydro power generation projects.

3. In this regard, a draft upfront tariff proposal was prepared by the Authority, with the objective of simplifying the tariff process, providing certainty to the

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potential investors, fast tracking the development of commercially attractive small hydropower sites, allowing material risk coverage to the investor, that were already available to them under the cost plus tariff regime and incentivizing early commissioning of hydropower projects. A hearing was held on June 24, 2013 in Islamabad to consider the aforesaid proposal.

4. Based on inputs received from various stakeholders and available information, the Authority revised the upfront tariff proposal (hereinafter referred to as the "upfront tariff proposal"). In line with the tariff setting process envisaged in the tariff rules, and with a view to arrive at a just and informed decision, notice of public hearing and salient features of the upfront tariff proposal were published in the national newspapers on July 11, 2014 inviting filing of intervention requests and comments. The Authority also served separate notices to various stakeholders for filing their comments, if any, on the draft upfront tariff proposal and its underlying terms and conditions.

5. In response to the notice of public hearing, following parties filed intervention requests which were accepted by the Authority:

   i) Blue Star Energy (Private) Limited

   ii) Kathai-II Hydro (Pvt.) Limited

   iii) RIAA Law

   iv) Riali Hydropower Company (Pvt.) Limited

6. Public hearing in this regard was held on July 25, 2014 at Lahore, which was attended by the Alternative Energy Development Board (hereinafter referred to as "AEDB"), Punjab Power Development Board (hereinafter referred to as "PPDB"), Water and Power Development Authority (hereinafter referred to as "WAPDA"), all the aforementioned interveners and various other stakeholders.

7. In addition to the intervention requests, comments in writing were also received by the Authority from the following stakeholders:

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i) AEDB

ii) Anwar Kamal Law Associates

iii) Azad Government of State Of Jammu & Kashmir Private Power Cell

iv) Board of Investment

v) Government of Khyber Pakhtunkhwa Energy & Power Department

vi) PPDB

vii) Taybah Jhing Energy (Pvt.) Limited

viii) Frontier Megastructure & Power (Pvt) Ltd.

ix) National Transmission & Despatch Company Limited

8. For ensuring meaningful participation of all the provincial governments in the tariff setting process, the Authority also scheduled a meeting with the representatives of provincial governments, Government of Azad Jammu & Kashmir, Government of Gilgit Baltistan, Indus River System Authority, AEDB and potential power purchasers i.e. Ex WAPDA distribution companies, K Electric Limited and National Transmission & Despatch Company Limited (hereinafter referred to as "NTDC") on January 06, 2015.

9. Salient features of upfront tariff proposal were as follows:

i) The year wise proposed upfront tariff on built, own, operate and transfer basis for small hydro power generation projects was as follows:

a. Low-head hydropower projects with head of 20 meters and below, and installed capacity of 1 MW to 25 MW

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Years	Tariff			
	With 100% foreign debt		With 100% local debt	
	(Rs. /kWh)	(US cents/kWh)	(Rs. /kWh)	(US cents/kWh)
1 to 10	9.3555	9.4980	12.7903	12.9851
11 to 30	3.8826	3.9418	4.1068	4.1694
Levelized	7.4499	7.5633	9.7668	9.9155

b. High-head hydropower projects with head of more than 20 meters, and installed capacity of 1 MW to 25 MW

Years	Tariff			
	With 100% foreign debt		With 100% local debt	
	(Rs. /kWh)	(US cents/kWh)	(Rs. /kWh)	(US cents/kWh)
1 to 10	8.5614	8.6918	11.6899	11.8679
11 to 30	3.5766	3.6310	3.7808	3.8383
Levelized	6.8257	6.9297	8.9360	9.0721

Upfront tariff based on mixed loan (foreign plus local) was proposed to be computed in accordance with the proposed loan composition of the relevant hydro power generation company.

ii) The upfront tariff proposal was based on the following per MW total project costs:

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	100% Foreign Financing	100% Local Financing
Low-Head Projects	US$ 3.139 Million/ MW	US$ 3.451 Million/ MW
High-Head Projects	US$ 2.199 Million/ MW	US$ 2.418 Million/ MW

iii) The upfront tariff was proposed to be applicable only to greenfield hydropower IPPs not financed through soft loans.

iv) The proposed upfront tariff was calculated based on 65% net annual plant factor for low-head hydropower projects and 50% for high-head hydropower projects.

v) The upfront tariff was proposed to be adjusted if actual certified net annual plant factor of the site was above 65% for low head hydropower projects and above 50% for high head hydropower projects.

vi) The project sponsor was proposed to have a one-time irrevocable option, at the time of opting for upfront tariff, to bear hydrology risk or to transfer this risk to the power purchaser. However, the projects having certified net annual plant factor below 65% for low head projects and below 50% for high head projects were proposed not to be eligible for transfer of hydrology risk to the power purchaser. In cases where hydrology risk was to be borne by the power purchaser, the tariff was proposed to be limited to the extent of benchmark net annual energy generation of the project; while net annual energy generation supplied to the power purchaser in a year, in excess of the benchmark net annual energy generation was proposed to be charged at 10% of the prevailing upfront tariff. Power producers opting to bear hydrology risk were proposed to be allowed to sell all power at the prevailing upfront tariff.

vii) The upfront tariff was proposed to be available only for projects with maximum transmission line length of 10 km for projects having 1-2 MW capacity, 20 km for projects above 2 MW to 10 MW capacity, and 2 km

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per MW for projects above 10 MW to 25 MW capacity. It was proposed that in case any hydropower project wished to go beyond the aforementioned restriction on length of transmission line, it would be required to do so at its own expense, without imposing additional financial burden, in any form, on the power purchaser/consumer.

viii) It was proposed that in addition to the conditions prescribed under up-front tariff regulations, hydro power generation companies meeting the following conditions would be eligible to opt for this upfront tariff:

a. Companies recommended by the relevant agency for the grant of upfront tariff.

b. Companies whose proposed plant and machinery is new and certified to be of acceptable quality by the relevant agency.

c. Companies confirmed by the power purchaser to fall within the limits outlined hereinabove regarding length of transmission line.

d. Companies having a certificate from the panel of experts of the relevant agency about the net annual plant factor of their site, based on their proposed installed capacity and long term historical hydrological data of the site.

ix) Following indexations and escalations were proposed to be available on quarterly basis:

Tariff Component	Indexation and escalations	
	With 100% local debt	With 100% foreign debt
Operations & maintenance costs:		
Local (72.50%)	Pakistan CPI	Pakistan CPI

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Foreign (27.50%)	US CPI & PKR / US Dollar	US CPI & PKR / US Dollar
Return on equity	PKR / US Dollar	PKR / US Dollar
Principal repayment of debt	-	PKR / US Dollar
Interest	3 months KIBOR	PKR / US Dollar & 3 months LIBOR

x) The proposed reference numbers for the upfront tariff were as follows:

PKR / US dollar parity	98.50
3 months KIBOR	10.17%
3 months LIBOR	0.23%

xi) It was proposed that the upfront tariff could be adopted within 12 months of its determination by the Authority.

xii) It was proposed that 20% of the local debt amount will be adjusted on one-time basis for exchange rate variation after eighteen months of financial close of the company.

xiii) It was proposed that the upfront tariff granted to any company will not remain applicable/valid if the company fails to achieve financial close within 12 months of grant of upfront tariff.

xiv) It was proposed that the decision to opt for upfront tariff once exercised will be irrevocable.

xv) It was proposed that this upfront tariff will be applicable for a tariff control period of thirty years from the commencement of commercial operations.

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xvi) It was proposed that all projects opting for the upfront tariff will be transferred to the Power Purchaser/ Govt. at a notional price of Rs. 1 at the end of tariff control period.

xvii) It was proposed that duties and taxes (including water use charges) on the hydropower generation company, not being of refundable nature, will be allowed as a pass through cost upon production of verifiable documentary evidence.

xviii) It was proposed that the carbon credits will be allocated between the power producer and power purchaser in the following ratios:

Year	Power producer	Power purchaser
1	90%	10%
2	80%	20%
3	70%	30%
4	60%	40%
5	50%	50%

10. Summary of submissions of the interveners/commentators in writing received by the Authority is given hereunder:

A) <u>Intervener no. 1 - Blue Star Energy (Pvt.) Limited</u>

i) Khyber Pakhtunkhwa and Punjab policies for development of hydropower potential require transfer of plant to respective governments at the end of lease period. The upfront tariff determination may be brought in harmony with the provincial policies.

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ii) Plant factor especially of low head power plants established on canals varies considerably over time due to man induced reasons like irrigation requirements or development of additional infrastructure. Decision of plant factor by the panel of experts will be a source of friction between the power purchaser and power producer. The power purchaser will be unwilling to enter into power purchase agreement if hydrological risk is transferred to it. The upfront tariff be determined on lines of upfront tariff determination of solar power projects, without the involvement of panel of experts i.e. tariff be reduced on higher than the benchmark plant factors, in order to simplify the procedure. Alternatively, if this proposal is not acceptable, then panel of experts from the relevant agency should periodically revise plant factor.

iii) The procedure about projects where equity exceeds 25% needs to be defined.

B) Intervener no. 2 - Kathai -II Hydro (Pvt.) Limited

Submissions of Kathai-II Hydro (Pvt.) Limited, provided with reference to upfront tariff proposal for high head projects were as follows:

i) The Authority may provide a simple table showing levelised tariff at different plant factors (e.g. 55%, 60%, 65% and 70%) in the final determination in order to communicate the true picture to developers and the general public about the affordability of hydropower projects.

ii) The Authority may consider revising the minimum plant factor to 55% based on cost plus determinations for projects such as Blue Star, Ghanool, Riali-II and Ranolia.

iii) The Authority may clarify that net annual plant factor used in the upfront tariff proposal is net of auxiliary consumption of 1%.

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iv) The EPC price per MW assumed in the proposal is based on the contract executed by PHYDO on June 28, 2011 for Ranolia Hydropower Project, which is now 3 years old. The prices of major inputs such as cement, steel, fuel and labor have increase by 35%, 13%, 11% and 33% respectively from June 2011 to June 2014. In view thereof, an adjustment/escalation in the base EPC cost be made to cover for inflation occurred over the last 3 years.

v) The 17MW Ranolia hydropower project lies at the higher end of the high head small hydropower projects below 25 MW, thus benefitting from economies of scale. An appropriate margin in project cost should be kept for 1-10 MW projects.

vi) A base EPC cost per MW of US$ 2.2 – 2.3 million is suggested.

vii) Project development cost of small hydropower projects needs to account for their relatively longer gestation period and uncertainty around land and resettlement costs. In view thereof, the project development cost of small hydropower projects should be around 10% of EPC cost.

viii) Financing fees and charges should be 3.5% of total debt in line with Authority's recent determination in upfront tariff for coal projects.

ix) A debt-equity ratio of 75:25 should be adopted in line with recent upfront tariff determinations for coal, wind and solar.

x) The assumed spread over LIBOR and KIBOR should be mentioned and be consistent with recent upfront tariff determinations by the Authority.

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xi) The Authority should also consider allowing Sinosure fee as per actual as a project specific adjustment as Chinese investment is one of the few realistic options for foreign financing.

xii) One-time adjustment 36 months after date of determination is proposed for 60% of EPC cost on account of civil works cost escalation. A formula for one-time adjustment based on determination of Patrind hydropower project was proposed.

xiii) One-time adjustment 36 months after date of determination was proposed for 40% of the EPC cost on account of exchange rate variation.

xiv) Non-EPC costs should also be adjusted based on revised EPC cost.

xv) Insurance component may be indexed at least partially to USD/PKR exchange rate.

xvi) Validity period of upfront tariff should be at least 2 years so that investors can assess the viability of upfront tariff and complete their developmental milestones in time.

xvii) The Authority may clarify the course of action to be adopted in case a company fails to achieve financial close within 12 months due to reasons outside its control.

xviii) The sponsor should be required to provide an affidavit stating that plant and machinery shall be new and of international standard, rather than requiring a relevant agency to certify the quality of the machinery, which may cause delay and uncertainty. The same verification may also be carried out at the time of commercial operations date by the independent engineer to be appointed as per the standard energy purchase agreement.

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xix) It may be clarified that duties and taxes being allowed as pass through, refer to taxes on income of the company as well as import duties on plant and equipment; whereas reimbursement of withholding tax on dividend may be limited to 7.5% of the return on equity component, unless the tax rate on dividends is changed subsequently.

xx) In view of DISCOs' lack of financial strength and capacity to execute complex contracts with IPPs, the Authority may stipulate in its determination that companies may sell energy either to the relevant DISCO or CPPA at interconnecting voltages less than 132kV. Further, the Authority may consider issuing guidelines regarding the evacuation arrangement in various scenarios based on the following suggestions:

a) Where a power producer elects to sell electric power to a DISCO at or below 132 kV, the concerned DISCO shall finance, own and operate the interconnection facilities. The DISCO shall include the cost of the interconnection facilities as part of its investment plan in its tariff petition to the Authority.

b) Where a power producer elects to sell electric power to CPPA at 132 kV, either NTDC or the relevant DISCO may finance and construct the interconnection facilities. NTDC or the DISCO, as the case may be, shall include the cost of the interconnection facilities as part of its investment plan in its annual tariff petition to the Authority. In both instances, the interconnection facilities once constructed and energized shall be owned and operated by the relevant DISCO. The respective rights and obligations arising from such arrangements shall be catered for in bilateral sale/purchase agreements to be executed between CPPA and the DISCOs as per standing instructions of the Authority to CPPA.

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c) Where a power producer elects to sell electric power to CPPA at a voltage level below 132 kV, the relevant DISCO shall finance, construct, own and operate the interconnection facilities and include the cost of the same in its annual tariff petition to the Authority. Such arrangements shall form part of the bilateral sale/purchase agreements between CPPA and DISCOs.

xxi) Project companies incorporated or registered in Pakistan with generation facilities in Azad Jammu & Kashmir should also be made eligible for the upfront tariff through minor modifications in the relevant Regulations.

xxii) It should be clarified in the determination that Variable O&M and water use charge components are equivalent to energy purchase price, whereas all remaining components are equivalent to the capacity purchase price, so as to avoid burdening the end consumer through a higher than usual incidence of sales tax charged to CPPA on the variable portion of tariff under the Sales Tax Special Procedure Rules, 2007.

xxiii) Suitable directions to CPPA regarding its payment obligations and apportioning of available funds should be issued to ensure that small hydropower projects are not faced with liquidity constraints due to their cheaper tariffs and smaller size.

C) <u>Intervener no. 3 - RIAA Law</u>

i) The condition in the proposal regarding exclusion of projects based on soft loans needs to be clarified. Particular financing arrangements of project developers are not relevant for upfront tariff. The term soft loan is subject to interpretation i.e. whether or not a particular project is based on soft loan. If the project developers have negotiated a lenient/sound financing

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arrangement beneficial to the project, the benefit should not be taken away from the project developer. Further, exclusion of hydro projects based on soft loans from upfront tariff regime is discriminatory as no such condition was stipulated in the upfront tariff for wind, imported/local coal and bagasse based co generation power projects.

ii) The upfront tariff proposal provides that net annual energy supplied to the power purchaser in excess of the benchmark shall be capped at 10% of the tariff. The Authority may consider removing the thresholds in relation to plant factor and provide clear guidelines/ stipulations in the upfront tariff determination as to the estimates of benchmark energy for various types of projects so that the prospective sponsors can take an informed decision.

iii) The upfront tariff proposal provides for water use charges as pass through item. It may be stipulated that power producer shall pay water use charges following receipt of the same from the power purchaser in order to reduce the financial burden of delayed payments from the power purchaser.

iv) Clarification should be provided whether indexation of insurance will be allowed. Indexation of insurance has already been allowed in the case of upfront tariff for wind power projects.

v) Pre COD sale of electricity should be allowed. Pre COD sale of electricity is already allowed under the wind and bagasse upfront tariffs.

vi) The conditions to qualify for the upfront tariff as mentioned in para 9 viii a, viii b, viii c and viii d of the upfront tariff proposal may be deleted as it may not be in the project sponsors' hands to meet these conditions within the proposed 12 month cut-off window for acceptance of upfront tariff. As an alternative, the

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Authority may clarify that the projects having an LOI/LOS from the relevant agency shall be deemed to have been recommended by the relevant agency and the developers may submit an undertaking that the plant and machinery is new and unused, as was the case in bagasse upfront tariff. Further, the Authority may provide a reasonable cut-off date to the relevant agency and power purchaser to provide their respective certificates/approvals.

vii) The Authority may allow full adjustment for exchange rate fluctuation in case of 100% local debt financing as opposed to 20% of the local debt provided in the upfront tariff proposal. Further, onetime adjustment for high head projects may include adjustments for land resettlement and civil works cost escalation.

viii) The upfront tariff determination should provide the interest rate assumed by the Authority.

ix) The upfront tariff should provide an option to the power producers to either sell electric power to CPPA at any voltage level or to Distribution Company at 132 KV or below.

x) The upfront tariff determination should clarify that projects based in Azad Jammu & Kashmir may also opt for the upfront tariff.

xi) Directions should be given to the relevant agencies to ensure that the standard Implementation Agreement and Power Purchase Agreement be prepared expeditiously.

xii) Timeline to achieve financial closing should commence once the standard concession agreements are in place.

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D) Intervener no. 4 - Riali Hydropower Company (Pvt.) Limited

i) The costs assumed for the determination of upfront tariff are in variance with the market prevailing rates.

ii) The advertised upfront tariff deviates materially from the feasibility stage tariff given to Riali Hydropower Company (Pvt.) Limited.

E) AEDB

The AEDB vide its letter dated July 23, 2014 provided comments on the upfront tariff proposal, however, the same comments were later on retracted by AEDB vide its letter dated August 04, 2014. The Authority after due consideration has decided that the earlier given comments are not to be made part of the proceedings.

Summary of AEDB's subsequent comments provided vide its letter dated January 21, 2015 is as follows:

i) The AEDB is not in the favour of passing on the hydrological risk to the power purchaser on the following grounds:

a) Globally, the upfront/ feed-in tariff schemes are designed on take and pay plus must run basis.

b) It will complicate overall transaction, as the processes and mechanism for metering, monitoring and payment in the project documents for SHPPs would become cumbersome and there would always be chance of dispute between power purchaser and the seller regarding hydrological risk matrix.

c) The project sponsors would have to conduct detailed feasibility studies and power production estimates and get

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them approved from relevant agencies. This will increase the project gestation period and eventually will be against the concept of the upfront/feed-in tariffs.

ii) For the net annual plant factor (as advertised in upfront tariff proposal i.e. 65% for low head and 50% for high head) the Authority needs to take position on this while referring to the database/sponsors' tariff applications available with it. However, these annual plant factors can be taken as basis for announcing upfront tariff and can be reviewed by the Authority later on. The proposal to adjust the upfront tariff if actual certified net annual plant factor of the site is higher than considered while developing the proposed upfront tariff mechanism is not supported as this will discourage improving efficiencies and bringing in efficient technologies.

iii) The upfront tariff for small hydro power projects broken into low head and high head categories should be given for the entire Pakistan, without further segregation.

iv) IRR for small hydropower projects should be equivalent to IRR allowed to other indigenous resources like coal.

v) The Authority may consider allowing Sinosure insurance as it is allowed in coal power plants.

vi) No limit on transmission line lengths should be imposed to encourage the sector.

vii) The matter of transfer at the end of power purchase agreement (hereinafter referred to as "PPA") term of 30 years for projects which have been leased out for 50 years under the provincial policies may be left on discretion of the project sponsors and the power purchaser.

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viii) The development period of the project including timelines for achieving financial close and the commercial operations date (hereinafter referred to as "COD") should be governed by the RE Policy and the security documents (Lol, LoS, EPA, IA) signed by the project proponents with respective agencies at the federal and provincial level.

ix) The tariff may allow undertaking the project on build-own-operate (BOO) basis as well.

x) The Authority may consider including water use charges in the upfront tariff to be payable by the IPPs to the respective provinces. The rate in this regard may be specified. These charges should be passed through in the upfront tariff. Also, the upfront tariff may indicate mechanism for payment of water use charges to the provinces.

xi) All the provincial governments and Azad Jammu & Kashmir may be asked to allocate sites/ land to all IPPs on-first-come-first serve basis for setting up of small hydropower project within one month of receipt of request from the IPP after necessary due diligence.

xii) Financial incentives may be considered for IPPs bearing the hydrological risk.

xiii) Small hydropower projects IPPs may be encouraged to share the hydrological, performance and forecasting data with the power purchaser, AEDB and other relevant agencies. The IPPs may install required equipment, software and other facilities to gather/ monitor/ predict such data and give live access of this to power purchaser, AEDB and other agencies.

xiv) The distribution of revenues to be earned through sale of carbon credits should be as per the RE Policy.

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F) Anwar Kamal Law Associates

Comments provided vide letter dated August 04, 2014:

i) The Authority must consider interconnection costs of small hydropower projects to ensure that the consumer end tariff remains affordable.

G) Azad Government of State of Jammu & Kashmir Private Power Cell

Comments provided vide letter dated October 02, 2014:

i) The Azad Jammu & Kashmir Government is mainly concerned with upfront tariff for high head hydropower projects, since less than 5% of identified potential is on low head canals.

ii) An official intimation from the Authority regarding NTDC being the signing authority on behalf of power purchaser is still awaited.

iii) Being the resource owner, the credits for reduction in carbon emission must be entirely paid to Azad Government of State of Jammu & Kashmir.

iv) The projects shall be transferred to Azad Government of State of Jammu & Kashmir at the end of tariff control period.

v) The proposed tariff is reasonably balanced and is supported by the Azad Government of State of Jammu & Kashmir.

vi) The choice to opt for upfront tariff or negotiated tariff should be left in the hands of the project sponsors.

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Comments vide letter dated January 21, 2015:

vii) Upfront tariff should be on take and pay plus must run basis i.e. hydrological risk will not be borne by the power purchaser, as most of Azad Jammu & Kashmir projects are on streams /nullahs where no appropriate gauging stations are installed and in most cases, the hydrology is derived with correlation methods. Therefore, it is not fair that hydrological risk should be borne by power purchaser.

viii) The upfront tariff should be based on net annual plant factor of 58% for low head hydropower projects and 48% for high head hydropower projects.

ix) The upfront tariff for small hydropower projects broken into low head and high head categories be given for the entire Pakistan. Any further segregation of this tariff will result in complications.

x) The IRR on equity for hydel power projects should be enhanced up to 20%.

xi) Sinosure/other political risk insurances etc. should be considered in the upfront tariff.

xii) Most of the Azad Jammu & Kashmir's hydel potential of approximately 2000 MW lies in District Neelum where there is no Grid. The transmission line lengths proposed in the upfront tariff can be considered reasonable if a Grid is constructed in Athmuqam or Sharda District Neelum.

xiii) The Projects should be transferred to the provincial Governments/ Azad Jammu & Kashmir after a concession period of 25 years.

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xiv) The final choice of either adopting the upfront tariff or negotiated tariff should be left to the Project Sponsors and the projects which have already been issued LOIs & LOSs under provision of policy 2002 may be allowed to opt this tariff.

xv) Tax exemption to some extent may be offered to the local manufacturer of electromechanical equipment to promote the local industry in the country.

H) Board of Investment

i) Board of investment generally supports the proposal as a potential tool to promote foreign direct investment in the power sector.

I) Government of Khyber Pakhtunkhwa Energy & Power Department

Comments provided vide letter no. CPO/E&P/the Authority/2014-15 dated September 04, 2014:

i) Energy and Power Department fully agree and appreciate the idea of upfront tariff mechanism and it should have been intact since long ago.

ii) The main advantage of upfront tariff is that it will save time of the sponsor in approaching the Authority for tariff determination.

iii) Interconnection is obligatory for NTDC/DISCOs i.e. the cost associated with transmission line should be borne by the power purchaser. The payment to purchaser should be made as per provision of the PPA already in vogue. CPPA may sign PPAs with project sponsors on behalf of the NTDC/DISCOs.

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iv) The Authority may develop a mechanism that may ensure timely completion of interconnection facilities by DISCOs/NTDC.

v) The Authority to encourage private sector investment for business of transmission and distribution of electricity and for that purpose the Authority to develop Special Purpose Transmission Services Rules within the provisions of the Act. It will help the Government to overcome the financial problems in financing the transmission and distribution system and would also speed up construction of interconnection facilities.

Comments provided vide letter no. CPO/E&P/NEPRA/2014-15 dated November 01, 2014:

vi) Special incentive should be available to the investors planning to develop hydel sector of war hit KPK.

vii) Prima facie the upfront tariff is very low to attract appreciable sponsors/investors/lenders. The risks are much higher than thermal, therefore, the ROE should be equal to or higher than Thar coal.

viii) Equity disbursements need to be skewed to years closer to COD.

ix) The upfront tariff for hydro needs to be based on CPP and Energy.

x) The size of small hydro projects to be enhanced to 100 MW instead of 25 MW.

xi) The Authority should link the upfront tariff with the interest rates offered by lenders. In case of soft loan, the upfront tariff should be reduced by that ratio as compared to standard applicable interest rate and Up front tariff should not be denied for soft loan.

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xii) The limit of plant factor needs to be reviewed as high head projects are sometimes operating below 50% plant factor depending upon hydrology and are yet technically and financially feasible.

xiii) The details of 'adjustment' to be done need to be given in the policy to evaluate the risk.

xiv) The Federal Power Policy 2002 and KP Power Policy 2006 allow that hydrology risk to be borne by Power Purchaser. In case the power purchaser does not bear the risk of hydrology then the tariff would become a sort of "take and pay" basis mechanism and in this scenario the tariff may be adjusted accordingly. Furthermore, the country is passing through severe energy crisis and if excess annual energy generation is supplied to the purchaser, at least, 50% of the prevailing upfront tariff power rates should be applicable.

xv) The Authority should link the upfront tariff with transmission voltages (11KV &132 KV). The transmission cost should not be part of upfront tariff. The purchaser to lay transmission line and its cost to be equally shared by producer and purchaser. It should be made part of the consumer-end tariff by DISCO in its tariff petition unless its cost is recovered.

xvi) The upfront tariff should be applicable to Provincial Governments owned Companies as well subject to the condition that minimum 80% of project cost be debt raised from local or foreign lenders.

xvii) The time to adopt upfront tariff after its determination by the Authority should be 18 months instead of 12 months as per the upfront tariff proposal.

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xviii) Time to achieve financial close after grant of upfront tariff should be 18 months instead of 12 months, and provincial government should be allowed to extend the financial close time once, if the reasons are cogent and beyond the control of investor.

xix) Upfront tariff should be applicable for the concession period and be enhanced by 10% after 10 years.

xx) At the end of concession period, all projects opting for the upfront tariff will be transferred to the respective provincial government at a notional price of Rs. 1.

xxi) Out of the revenue generation from trading of carbon credits, 60% be taken by producer and balance 40% be equally shared between purchaser and respective provincial governments.

Comments provided vide letter no. E&P/CPO/NEPRA/2014 dated December 01, 2014:

xxii) We fully support the Authority's effort and initiative to cause induction of hydel power into the energy mix on fast track basis. We truly believe that the vision of the Authority will bring a paradigm reduction in overall cost of service and tariff to boost the economy and give relief to the consumers from high cost thermal plants. The Authority's efforts will generate employment and indigenization which will have highly positive effects on the economy.

xxiii) The hydro tariff may be evaluated not on stand-alone basis but one on system LRMC regime, which is an excellent mechanism to reduce the tariff and improve the service.

xxiv) Hydel projects are complex and have their own intricacies, therefore these need to be dealt differently from thermal power plants.

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xxv) The project cost is a function of quality and distance from main business centers, transportation of material and HR cost has been indexed to distance and availability. It is fact that maximum hydro potential of the country is available in Khyber Pakhtunkhwa and as such special incentive should be available to develop hydro sector of war hit KPK.

xxvi) The project costs for December 2014; indexed thereof to US CPI & Pak CPI at the ratio of 30:70 are as follows:

<u>Chinese OEM & EPC</u>

i) Zone 1 Swat US$ 3.40 Million/MW
ii) Zone 2 Dir US$ 3.30 Million/MW
iii) Zone 3 Chitral US$ 3.80 Million/MW
iv) Zone 4 Hazara US$ 3.60 Million/MW
v) Zone 5 Other Parts of KP US$2.80 Million/MW

<u>Pakistan/European/US/Japan/ S.Korean OEM & EPC any Country</u>

i) Zone 1 Swat US$ 4.65 Million/MW
ii) Zone 2 Dir US$ 4.55 Million/MW
iii) Zone 3 Chitral US$ 4.95 Million/MW
iv) Zone 4 Hazara US$ 4.75 Million/MW
v) Zone 5 other parts of KPK US$ 4.00 Million/MW

xxvii) The IRR net of taxes should be as follows:

a) IRR to be 5% higher than imported coal IPPs IRR in vogue for zones 1 & 2.

b) IRR to be 4% higher than imported coal IPPs IRR in vogue for zones 3 & 4.

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c) Additional 0.75% IRR if minimum 75% Directors of the EPC contractor are Pakistan domicile.

d) Additional 1% IRR if 80% or more of Plant, Equipment and Machinery are manufactured in Pakistan verified by a third party appointed by Energy & Power Department, Government of Khyber Pakhtunkhwa.

e) Additional 2 % IRR if the turbine is manufactured in Pakistan verified by a third party appointed by Energy & Power Department, Government of Khyber Pakhtunkhwa.

f) Additional 1% IRR if the COD is below 4 years from issuance of LOS.

xxviii) International and national financing insurance to be maximum 5% of principal and mark-up.

xxix) 18 months be given for Financial Close after issuance of LOS.

xxx) The sponsor may opt for continuation of ownership for 5 more years beyond the PPA term at 1/3rd of the tariff and balance tariff will be shared with the Provincial Governments; if not then the Sponsor to transfer the assets to the Provincial Government where project is located at Rs 1/-

xxxi) Carbon Credits to be shared between the Sponsor and Provincial Governments as follows:

a) Years 1 to 5- at 70:30

b) Years 5 to 10- at 50:50

c) Years 10-20- at 35:65

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d) Years 20-30 or 35 at 30:70

xxxii) Payment on EPP basis only.

xxxiii) Water resources shall be used optimally, therefore the turbine hydraulic efficiency has to be 90% or more.

xxxiv) Auxiliary power shall not exceed 1.50 % of the power (kWh) sold.

xxxv) Plant factor of 40% may be taken for calculating the upfront tariff.

xxxvi) Full tariff (Rs/Kwh) payment at annual plant factor 40% to 50%.

xxxvii) Adjusted tariff payment at annual plant factor 50% or more so that the revenue requirement does not exceed equivalent to 50% annual plant factor.

xxxviii) Adjusted tariff payment at plant factor 40% or less so that the revenue requirement does not exceed equivalent to 30% annual plant factor.

xxxix) Water use charges at Rs. 2000/MW/Annum (Dec-2014 term) thereof increased at the rate of 25% every 5th anniversary of COD. Water use charges payable every quarter.

xl) Plant availability at *'Must-Run'* on economic dispatch list.

xli) Power transformer efficiency not below 98% under ISO conditions.

xlii) The upfront tariff will be available only for projects with maximum transmission line length of:

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- 20 km for projects having capacity of 1-2 MW capacity,
- 30 km for projects above 2 MW to 10 MW, and
- 3 km per MW for projects above 10-25 MW capacity.

xliii) The transmission line will be built by the off-takers (DISCOS, NTDCL, CPPA, provincial governments) at its own cost and risk. However, in case the sponsor intends to build it then a separate tariff under rules in vogue will be given.

xliv) In case any hydropower project wishes to go beyond the aforesaid restriction on length of transmission line, it will be required to do so at its own expense, without imposing additional financial burden in any form on Power Purchaser/Consumers.

xlv) The power off-takers shall install the transmission line and grid station equipment atleast 4 months prior to commercial operations date of the power plant; failure to do so on commercial operations date shall attract LDs on power off-takers equal to EPP tariff payable to the Sponsor.

xlvi) The above steps will help to develop cheap and clean electricity resulting in overall reduction in electricity tariff. It will also help in overall reduction in price of all commodities resulting in increase of exports of the country, employment, tax base, improvement in balance of payment and numerous other benefits.

J) <u>PPDB</u>

Comments provided vide letter dated August 29, 2014:

i) Small hydro power projects under facilitation of PPDB:

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a) PPDB is facilitating the development of small hydro power projects of about 120.80 MW aggregate installed capacity all of which fall in the category of below 20 meters head height, however only about half of them meet the benchmark about plant factor of 65%.

b) A recent study has been conducted by the World Bank on hydro power potential of the system in which 35 sites with aggregate installed capacity of 419 MW have been declared technically feasible for development of small hydro power. An abstract there from is enclosed for consideration of the Authority. This study reveals that only 16 sites fall in the range of 65% and above plant factor whereas the remaining technically and financially feasible potential of 361 MW will not benefit from the under consideration upfront tariff.

c) Benchmark plant factor of 65% also proves disadvantageous when viewed in terms of proposed criteria for absorption of hydrological risk by the power purchaser. The Authority may consider 'Draft Simplified Framework for Fast-track Development of Private Sector Hydropower Projects May-2012' whereby plant factor benchmark of 45% has been suggested without imposition of any limit on head size.

d) It is suggested that the Authority may consider announcing following separate upfront tariffs for small hydropower projects:

- Two part tariff with inherent arrangement of 'hydrological risk' being absorbed entirely by the power purchaser; and

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- A comparatively higher single part tariff with inherent arrangement of hydrological risk being absorbed entirely by the IPP.

ii) Projects financing arrangements:

Minimum and maximum equity injection into the projects CAPEX may be capped to 20% and 30% respectively in line with the projects based on other technologies, without imposition of any restriction on the higher side, subject to treatment of equity exceeding 30% of the project's CAPEX as debt financing for reckoning of upfront tariff. Moreover, debt part of the project financing may be allowed through mix of local and foreign financing and subsequent adjustment of the upfront tariff based on actual financing mix accordingly at the time of COD.

iii) Debt financing cost of capital:

The Authority may consider allowing LIBOR plus 4.50% for foreign financing and KIBOR plus 3.50% for local financing in the upfront tariff in line with recently announced tariff determinations of other technologies. Moreover savings, if any, in the premium may be specified for sharing between the power purchaser and the power producer in the ratio of 60:40 respectively.

iv) Financial fees and charges:

The Authority may consider allowing financial fees and charges @ 3.50% of the debt financing of the project's capital cost in line with its earlier tariff determinations of different technologies.

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v) Local debt financing - one-time adjustment for exchange rate variation:

Ceiling of 20% in the upfront tariff proposal (for one-time adjustment of local debt on account of exchange rate variation) needs further clarification and warrants due diligence keeping in view debt financing mix as well as foreign portion of the CAPEX likely to be expensed on import of 'Electro-mechanical equipment' and other incidental amenities.

vi) Clarity about power purchaser:

CPPA may be made responsible to deal with small hydro power projects on behalf of DISCOs irrespective of size of the plant.

vii) Carbon credits:

Notice of public hearing does not mention any treatment in the tariff calculations with respect to operational period's proceeds emanating from certified emission reductions. The Authority may instruct the power producer(s) to process and obtain the emissions/carbon credits expeditiously, where permissible keeping in view size of the plant, and share such proceeds equally with the power purchaser duly considering the present development of coal power projects. It may be considered that representation of carbon credit sharing entities is ensured during execution of the relevant agreement to safeguard their individual interests.

viii) Applicability of upfront tariff:

It is recommended that small hydro power projects, whose tariff has already been determined by the Authority, may also be allowed to opt for this upfront tariff.

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Comments provided vide letter dated January 12, 2015:

ix) The hydrological risk should be borne by the power purchaser.

x) Plant factor for the very low head hydel power projects may be reduced to 45%.

xi) The proposed up-front tariff for small HPPs by the Authority will not attract the Developers/Investors; interested in developing very low head hydel projects (0.5m to 5m head height) in the country, as the cost /MW of such projects is higher. Therefore, a new category for very low head projects may be created under the up-front tariff regime and separate tariff may be calculated for this type of technology.

xii) The upfront tariff should be technology-specific and area-specific.

xiii) 17% IRR as per existing policy should continue under upfront tariff for hydel projects as it provides a fair return given the market conditions.

xiv) Sinosure/other political risk insurance should be considered in the upfront tariff as it would act as incentive and help channelize financial resources into energy sector.

xv) The proposed transmission line length formula for the 2-10 MW category (i.e. maximum 20 km) and 10-25 MW category (i.e. maximum 2 km per MW) needs reconsideration, in view of the fact that most of the hydel power producers disperse the energy through 11 kV transmission line to the grid, which, beyond the distance of 10-12 km, may require grid station adding substantial financial cost to energy transmission process, resulting in higher capital cost and higher tariff.

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xvi) As per policy, the sites in the Punjab province will be transferred to provincial government after 30 years on a notional payment of Rs.1. Therefore, the proposal requires no change in this regard.

xvii) The proposed upfront tariff has been worked out on 100% foreign and 100% local financing. The general practice of financing based on 80:20 debt-equity and mixed loan (foreign + local) appears to be reasonable and realistic.

xviii) Carbon credits may be shared between Power Producer and Power Purchaser as per Renewable Energy Policy 2006 instead of proposed inverse sharing formula / series of proceeds sharing between them.

xix) The proposal regarding duties & taxes including water use charges to be treated as pass-through items payable on production of verifiable documents requires reconsideration and amendments. Water use charges should be treated as cost item under Energy Charges Component of Tariff.

xx) Two-Part Tariff (Energy Charges + Capacity Charges), with inherent arrangements of Hydrological Risk being absorbed entirely by the power purchaser, is proposed.

xxi) Keeping in view the ineffectiveness of DISCOs in execution of bilateral Power Purchaser Agreements, the CPPA, by virtue of its mandate under the Generation License of NTDC should be made responsible to deal with the IPPs on behalf of DISCOs, irrespective of size of the plant. NTDC/ CPPA and respective DISCO may arrive at a mechanism to deal with their bilateral technical and commercial concerns without any intervention on part of the power producers. The relevant federal agencies may be requested to finalize the tripartite power purchase agreement so that PPAs may be executed among NTDC/ CPPA, respective DISCOs and the project company with clear cut defined rights

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and obligations of each party for three different categories i.e. 1-10 MW, 10-25 MW & 25-50 MW.

K) Taybah Jhing Energy (Pvt.) Limited

Comments provided vide letter dated August 04, 2014:

In order to enable hydro power projects in Azad Jammu & Kashmir to fully benefit from the upfront tariff scheme, a clear and fast track mechanism/process for adoption of upfront tariff, and identification of power purchaser for hydropower projects in Azad Jammu & Kashmir must be spelled out in the determination.

L) Frontier Megastructure & Power (Pvt) Ltd.

Comments provided vide letter dated September 24, 2014:

i) The absence of proper framework to execute power purchase agreements with DISCOs is a major hurdle in materialization of small hydropower projects.

ii) Major incapacities faced by DISCOS are related to Grid Connectivity and capacity determination of plants through the use of hydrology studies. The Authority should develop standard procedures for capacity determination, or the power purchaser should be allowed to hire private consultants to undertake the vetting of hydrology studies, to be carried out within a fixed timeframe.

iii) The actual cost of insurance provided by insurance companies in Pakistan is 2% of the EPC cost (for various reasons, including security concerns in northern areas).

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iv) Determining fixed O&M on the basis of EPC cost would be disadvantageous for projects with smaller capacity and hence lesser EPC cost.

M) NTDC

Comments provided vide letter dated January 27, 2015:

i) Based on past experience of CPPA for wind projects, the wind risk coverage by the purchaser leads to various operational complexities. Moreover, specifically for small hydropower projects, a relatively increased chance of manipulation of sensor readings is always imminent. Therefore, the hydrological risk should be covered by the project sponsor in all cases. Moreover, instead of allowing hydropower projects that are bearing the risk of hydrology to sell all power at the prevailing upfront tariff, the Authority may consider its upfront tariff for wind power projects, wherein the payment for energy more than benchmark is made in tariff slabs each covering some percentage of the total tariff.

ii) The annual plant factors for both Low-Head and High-Head Power Plants, proposed in the draft upfront tariff, is at the higher end, which may initiate a trend of developing low capacity HPPs for same head at the sites where higher net annual energy could have been achieved with installation of Higher Capacity Plants with relatively lesser annual plant factors. A range of annual plant factor of 40-50% appears to be reasonable for both Low-Head and High-Head Power Plant for upfront tariff. However, higher Plant Factor can be considered for projects on the canals as they have consistent high water flows.

iii) Principally, CPPA is of the opinion that the tariff must be same for the entire country. However, as the main risk for hydro power projects in Khyber Pakhtunkhwa is of security, the

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Authority may deem it fit to increase tariff by a certain amount as incentive to Sponsors. However, this may be done with the approval of all stakeholders to avoid any misunderstandings or distrust in future.

iv) The assumptions regarding project cost are already on the higher side; therefore, setting a higher IRR will increase the burden of the end consumers. To avoid any discrimination, the IRR allowed to other hydro projects may be matched for these projects.

v) Political risk insurances will be covered in the implementation agreements to be signed between the project sponsors and the government. Moreover, as most of the investors already working on small hydro power projects are Pakistan based, therefore, Sinosure may not be considered for these projects.

vi) The transmission line lengths proposed in the upfront tariff are reasonable.

11. Based on the intervention requests accepted by the Authority, comments of the stakeholders, tariffs for small hydro power generation companies already determined by the Authority, information otherwise available with the Authority and proceedings of the case, the Authority has deliberated in detail on the subject of determination of upfront tariff. The major issues deliberated by the Authority are as follows:

i) Whether power purchaser for small hydro power generation projects would be the relevant distribution company or the Central Power Purchasing Agency?

ii) Whether upfront tariff would be applicable for projects located in areas outside the Authority's jurisdiction?

iii) Whether hydrological risk should be borne by the power purchaser?

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iv) Whether upfront tariff is to be further segregated according to geographical regions or any other criteria?

v) Whether interconnection line lengths as indicated in the upfront tariff proposal are justified?

vi) Whether allocation of carbon credits in accordance with the upfront tariff proposal is justified?

vii) Whether the rate of return on equity assumed in the upfront tariff proposal is reasonable?

viii) Whether existing power projects will have the option to opt for this upfront tariff?

ix) Whether 20% of local debt amount, to be adjusted on one-time basis for exchange rate variation, as considered in the upfront tariff proposal is justified?

x) Whether phasing of equity and debt injections considered in the upfront tariff proposal is justified?

xi) Whether the project costs ranging between US $ 2.199 million/MW to US $ 3.451 million/MW, as advertised in the upfront tariff proposal, are justified?

xii) Whether annual plant factor of 65% for low head hydropower projects and 50% for high head hydropower projects, considered in the upfront tariff proposal, is reasonable?

xiii) Whether Sinosure fee should be allowed in the upfront tariff?

xiv) Whether upfront tariff should be applicable to projects financed through soft loans?

xv) Whether pre-COD sale of electricity should be allowed in the upfront tariff?

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xvi) Other issues.

12. **Whether power purchaser for small hydro power generation projects would be the relevant distribution company or the Central Power Purchasing Agency?**

During the proceedings, numerous stakeholders raised concerns regarding the unwillingness of CPPA/NTDC to enter into PPAs with small hydro power generation companies, and challenges faced by small hydropower generation companies in executing PPAs with distribution companies, due to their financial and technical incapacities. The Authority has decided that small hydropower generation companies, should have the option to sell electric power to either CPPA/NTDC on behalf of distribution companies at any voltage level or to the relevant distribution company at 132 KV or below. In order to provide clarity on the matter, the Authority has notified the National Electric Power Regulatory Authority (Sale of Electric Power by Renewable Energy Companies) Guidelines, 2015, which are also applicable to small hydropower projects of 50 MW or less capacity. With the notification of these guidelines, ambiguities/barriers faced by small hydropower projects, regarding the identity of power purchaser, will be removed.

13. **Whether upfront tariff would be applicable for projects located in areas outside the Authority's jurisdiction?**

During the proceedings, numerous stakeholders submitted that upfront tariff should also be available for projects located in Azad Jammu & Kashmir. The Authority has considered the issue and has noted that major hydro power generation potential of Pakistan is located in Azad Jammu & Kashmir and Gilgit-Baltistan. The Authority has decided that this upfront tariff would also be available for hydro power generation companies located outside legal jurisdiction of the Authority. In such cases, the provisions of National Electric Power Regulatory Authority Interim Power Procurement (Procedure And Standards) Regulations, 2005 will be followed and on request of the power purchaser, upfront tariff will be granted by the Authority for such power acquisitions, as is already being done by the Authority, on the request of NTDC for import of power from territories outside the jurisdiction of the Act. The

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power purchaser i.e. NTDC shall submit the request/draft PPA, in the manner prescribed in National Electric Power Regulatory Authority Interim Power Procurement (Procedure And Standards) Regulations, 2005, for all projects situated in territories outside jurisdiction of the Authority, who intend to opt for this upfront tariff determined by the Authority.

14. **Whether hydrological risk should be borne by the power purchaser?**

During the proceedings, mechanism for bearing of hydrological risk either by the power purchaser or by the power producer was discussed and deliberated upon in detail. Certain stakeholders supported the notion that hydrological risk should be borne by the power producer, whereas others were of the opinion that hydrological risk is too great a burden to be borne by the private power producers. The Authority has observed that under the cost plus tariff regime, hydrological risk is being borne by the power purchaser, which is in line with the prevalent power policies. The Authority keeping in view the nascent stage of development of small hydropower generation in Pakistan and for making the upfront tariff a viable option for the power producers, has decided to maintain the provisions of upfront tariff proposal on this issue since it provides both the options to the power producer i.e. either to retain or not to retain the hydrological risk, along with incentive to the power producer for retaining the hydrological risk.

15. **Whether upfront tariff is to be further segregated according to geographical regions or any other criteria?**

During the proceedings, various stakeholders provided their inputs regarding structure of the proposed upfront tariff. Government of Khyber Pakhtunkhwa Energy & Power Department provided zone wise and manufacturers/contractors country wise costs for consideration of the Authority. Further, they also requested special incentives for projects to be developed in war torn areas. PPDB requested for introduction of a new category for very low head hydro power projects. The Authority has considered submissions of all the stakeholders and has decided that this upfront tariff, being the first developed by the Authority for small hydro power generation

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projects in Pakistan, be based on a holistic approach. Thus the upfront tariff has not been tailored to favor any particular technology or region, rather the upfront tariff has been formulated with the sole view of harnessing the most economical hydropower sites on priority.

16. **Whether interconnection line lengths as indicated in the upfront tariff proposal are justified?**

In view of the fact that interconnection costs and transmission losses have a profound impact on economic viability of small hydropower projects, the draft upfront tariff proposal suggested certain restrictions on transmission line lengths allowable to projects under the upfront tariff regime. The Authority has received divergent opinions from various stakeholders on this issue. The Government of Khyber Pakhtunkhwa Energy & Power Department has suggested to enhance the maximum limits of interconnection transmission line lengths, whereas AEDB has suggested that there should be no limitation on the transmission line lengths for small hydropower projects. PPDB has suggested that 11 kV transmission line length beyond 10-12 km would require substantial additional investment and would result in higher tariff.

The Authority is of the view that interconnection costs and transmission losses need to be regulated, in case of small hydropower projects, due to remote nature of many of the potential sites. The Authority after deliberations has decided to issue detailed guidelines regarding permissible interconnection arrangements of power projects. These guidelines once notified will also be applicable to projects who will opt for this upfront tariff. In the meanwhile, the power purchasers at the time of issuing their consent for power purchase should verify that the grid interconnection arrangements are economically feasible. The Authority hereby also clarifies that interconnection costs have not been considered in this upfront tariff.

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17. Whether allocation of carbon credits, in accordance with the upfront tariff proposal, is justified?

The upfront tariff proposal provided a sharing mechanism of carbon credits, which was not consistent with the prevalent power policies. Certain stakeholders have commented that sharing of carbon credits should be allowed in line with the prevalent power policies. The Authority has considered the issue and has noted that changing the mechanism for sharing of carbon credits might further complicate efforts being made for realization of carbon credits. The Authority, in view of comments received from various stakeholders has therefore decided that in case the companies opting for the upfront tariff become entitled to receive carbon credits, the same shall be processed and obtained expeditiously and credited to the power purchaser as per the Policy for Development of Renewable Energy for Power Generation 2006, as amended from time to time.

18. Whether the rate of return on equity assumed in the upfront tariff proposal is reasonable?

Some of the stakeholders have submitted that internal rate of return on equity for small hydropower generation projects, should be equivalent to internal rate of return on equity allowed for Thar coal power projects. The Authority is already cognizant of this issue, and in its decision dated November 21, 2014, regarding motion for leave for review filed by Fazal-e-Akbar & Company on behalf of Asad Umer (Member National Assembly) under National Electric Power Regulatory Authority (Review Procedure) Regulations, 2009 with respect to the Upfront Tariff of Coal, the Authority has already clarified as under:

> *"After considering the Petitioner argument in support of Hydro, the Authority clarifies that hydro returns are better than the returns allowed to non Thar coal plant. However, the Authority realized that the IRR allowed to Hydro should be at least at par with IRR allowed to Thar coal so that the returns allowed to various types of coal i.e. imported, local, & Thar are not more than what has been allowed to Hydro. Therefore, to encourage clean*

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technology and to attract hydro investment in the region, the Authority therefore, assures that the returns on investment in Hydroelectric shall enjoy at least similar returns as allowed by the Authority to Thar coal investors."

The Authority, keeping in view its aforesaid decision in principle, has decided that the internal rate of return on equity, forming the basis of this upfront tariff should be enhanced to 20%. The upfront tariff has accordingly been amended.

19. **Whether existing power projects will have the option to opt for this upfront tariff?**

The Authority observed that upfront tariff proposal specified that it will only be applicable to green field hydropower IPPs. The Authority has deliberated on the issue whether existing power projects, whose feasibility stage tariff has already been determined by the Authority, should be allowed to opt for this upfront tariff. The Authority after due consideration has decided that such power projects will be allowed to opt for this tariff, provided they are green field.

20. **Whether 20% of local debt amount, to be adjusted on one-time basis for exchange rate variation, as considered in the upfront tariff proposal is justified?**

The Authority, keeping in view the fact that for projects financed through local debt, indexation with US $/PKR exchange rate variation is not allowed for debt servicing component of tariff, thereby exposing such projects to US $/PKR exchange rate variation risk during construction period, included a condition in the upfront tariff proposal that 20% of the local debt amount will be adjusted on one-time basis for exchange rate variation after eighteen months of financial close. This adjustment was not required for projects financed through foreign debt, as debt servicing component of tariff in their case is indexed with US $/PKR exchange rate.

During the proceedings, some of the stakeholders objected to the condition of adjustment of only 20% of local debt amount, for exchange rate variation. The

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Authority after consideration of the issue has observed that, in case of hydro power projects, normally payments in foreign currency are higher than 20% of the project cost and has therefore decided that instead of 20% as stipulated in the upfront tariff proposal this limit should be enhanced to 40% of the local debt amount.

21. **Whether phasing of equity and debt injections considered in the upfront tariff proposal is justified?**

The upfront tariff proposal considered the following pattern of financial injections into the project for computation of tariff:

Year 1	Year 2	Year 3
25.00%	45.00%	30.00%

The Authority noted that the pattern of financial injections into the project, considered in the upfront tariff proposal, was based on the claims of various small hydro power projects. However, those projects had not yet commenced commercial operations and therefore their claims were not based on actual results. The Authority also considered the comments offered by the Government of Khyber Pakhtunkhwa Energy & Power Department regarding the phasing of financial injections. The Authority also observed that special return on equity being allowed to small hydro power projects under the cost plus tariff regime, for 30 months prior to construction start, has not been considered in this upfront tariff. The Authority after consideration of all the aforesaid facts has decided that the following phasing of financial injections into the project will be a more realistic basis for the upfront tariff for small hydropower projects:

Year 1	Year 2	Year 3
35.00%	45.00%	20.00%

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22. **Whether the project costs ranging between US $ 2.199 million/MW to US $ 3.451 million/MW, as advertised in the upfront tariff proposal, are justified?**

During the proceedings, various stakeholders commented on the project cost assumptions forming the basis of upfront tariff. The Authority has received different submissions from stakeholders, regarding the per MW project cost to be considered in the upfront tariff of small hydro power generation projects. The Authority is cognizant of the fact that standard project costs per MW are non-existent for hydropower projects, due to number of variable parameters, which are unique to each site.

The Authority has noted that project costs considered in the upfront tariff proposal were based on actual contracted EPC costs of a provincial government small hydropower generation projects, recently approved by the Authority. The Authority noted that any variation in project cost directly effects the tariff, with higher project costs making the tariffs higher. After considering all the aspects, the Authority has decided to maintain the provisions of upfront tariff proposal on this issue.

23. **Whether annual plant factor of 65% for low head hydropower projects and 50% for high head hydropower projects, considered in the upfront tariff proposal, is reasonable?**

With a view to initially facilitate development of the best small hydropower sites in the country and keeping the tariff affordable, the upfront tariff proposal was based on plant factor of 50% for high head projects and 65% for low head projects. During the proceedings, numerous submissions were made by the stakeholders regarding reasonability of the plant factors forming the basis of upfront tariff. Certain stakeholders have requested the Authority to decrease the minimum plant factor criteria, while others have suggested that the minimum plant factor criteria should be increased.

In this regard, PPDB provided relevant data regarding estimated plant factors of potential sites in Punjab. The Authority, after considering all the available information, has decided to maintain the provisions of upfront tariff proposal

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on this issue. The Authority has noted that all the potential sites cannot be covered under this upfront tariff. However, it is hereby clarified that projects below the stipulated plant factors can still opt for the upfront tariff by bearing the hydrological risk i.e. hydrological risk will not be borne by the power purchaser in such cases. By allowing projects with lower plant factors to sell all energy at the prevailing upfront tariff, it has been ensured that those projects that are technically and financially viable, despite operating below the stipulated minimum plant factors, will not be eliminated from the ambit of upfront tariff regime.

24. **Whether Sinosure fees should be allowed in the upfront tariff?**

During the proceedings, certain stakeholders requested the Authority to consider allowing Sinosure/other political risk insurance related fees as project specific adjustments, in order to incentivize and channelize foreign financing for small hydropower generation projects. The Authority has considered the issue and has decided that for projects having foreign financing from Chinese banks, Sinosure fees will be allowed at actual, not exceeding 7% of the total benchmark or actual Chinese debt, whichever is lower. In case the sponsors manage better alternative Sinosure arrangement, the same will be considered at the time of allowing adjustment for Sinosure fees. The power producer, if it intends to claim Sinosure fees, shall submit the relevant authentic documentary evidence to the Authority, within 15 days of commercial operations date of the relevant company/project. The Authority hereby further clarifies that no Sinosure fees has been considered in the computations of upfront tariff allowed through this determination.

25. **Whether upfront tariff should be applicable to projects financed through soft loans?**

During the proceedings, intervener no. 3 has submitted that exclusion of hydro power projects based on soft loans from upfront tariff regime is discriminatory as no such condition was stipulated in the upfront tariff for wind, imported/local coal and bagasse based co generation power projects. The Authority has considered the issue and has decided that instead of introduction

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of a new concept of soft loans, savings in the premium over KIBOR/LIBOR allowed in this upfront tariff, shall be shared by the power purchaser and the power producer in the ratio of 60 : 40 respectively. The power producer shall submit the relevant authentic documentary evidence to the Authority, for the requisite adjustment within 15 days of commercial operations date of the relevant company/project. The Authority hereby also clarifies that 3 months LIBOR plus a premium of 450 basis points for foreign financing and 3 months KIBOR plus a premium of 300 basis points for local financing has been considered in the computation of upfront tariff allowed through this determination. In case the premium on KIBOR/LIBOR is higher than that mentioned above, no adjustment on the basis of actual higher premium will be allowed.

26. Whether pre-COD sale of electricity should be allowed in the upfront tariff?

The Authority, in comparable upfront tariffs has allowed pre-COD sale of electricity to the power producers. Accordingly, the Authority has decided to allow pre COD sale of electricity to the power producers in this upfront tariff, subject to the terms and conditions of PPA, at the applicable tariff excluding principal repayment of debt component and interest component. However, Pre-COD sale will not alter the required commercial operations date stipulated by the PPA in any manner.

27. Other issues

27.1 Various stakeholders have raised their concerns regarding the availability of standardized security documents viz. standardized power purchase agreement and implementation agreement, for hydropower projects opting for upfront tariff. The Authority is cognizant of the fact that for making the upfront tariff workable, standardized security documents need to be available at earliest. The Authority has noted that the existing standardized security documents for hydropower projects under the cost plus tariff regime, could be modified to cater for the provisions of upfront tariff. The Authority after due consideration hereby directs AEDB to act as a focal agency for finalization of standardized security documents at the earliest.

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27.2 Some of the stake holders have submitted that withholding tax on dividend should also be allowed as a pass through item. The Authority has noted that withholding tax on dividend has not been allowed as a pass through item in the upfront tariff for solar and coal. The Authority has accordingly decided not to allow withholding tax on dividend as a pass through item in this upfront tariff.

27.3 An intervener has submitted that procedure where equity exceeds 25% needs to be defined. The Authority hereby clarifies that debt equity ratio assumed in the upfront tariff, is not subject to adjustment based on actual, and the upfront tariff does not place any restriction on the actual debt equity ratio for any project.

27.4 The Authority has also considered that hydrology of some sites has to be arrived at by interpolation with actual long term historical hydrology of main rivers/streams. The Authority considering the aforesaid issue has decided that in case of projects located on small streams, where only short-term data has been collected at the actual site and flow patterns need to be synthesized with actual long term historical hydrology of main river/streams, the long-term historical hydrology of the main river/streams, if considered appropriate by the panel of experts, may be used for arriving at the annual plant factor of a particular site. In such cases, appropriate gauges should be installed on the actual site and monitored by the power purchaser. If over long term, material variation between actual hydrology of the site and hydrology assessed by the panel of experts as detailed above is observed by the power purchaser, it shall be placed before the Authority by the power purchaser, for its consideration.

27.5 The Authority, on the basis of auxiliary consumption allowed in tariff determinations for some small hydropower generation projects, based its upfront tariff proposal on auxiliary consumption @ 1%. No concrete comments either in favour or against the allowed auxiliary consumption considered in the upfront tariff proposal were submitted by any party in this regard. The Authority has therefore decided to maintain the provisions of upfront tariff proposal on this issue.

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27.6 The Authority hereby clarifies that the upfront tariff is a take it or leave it package deal. Any request for modification in the upfront tariff or any of its terms/conditions, to meet the specific or unique requirements of any of the small hydro power generation companies, shall not be considered by the Authority whatsoever.

27.7 The Authority has also considered that companies might opt for upfront tariff without finalisation of their detailed project design. The Authority noted that upon finalisation of detailed project design, installed capacity of the project may change, which will also affect among other parameters, the net annual plant factor on which upfront tariff is based. The Authority for making the upfront tariff workable has decided to allow onetime adjustment, on the finalisation of detailed project design, based on revised net annual plant factor. The power producer shall submit request for this onetime adjustment, within 15 days of commercial operations date of the relevant company/project, accompanied by the revised panel of experts certificate regarding net annual plant factor. Other terms and conditions of the upfront tariff, including for installed capacity and net annual plant factor will remain applicable. For projects which have already opted for upfront tariff on the basis of detailed project design, this onetime adjustment will not be applicable.

27.8 The Authority hereby also clarifies that the 'Mechanism For Determination Of Tariff For Hydropower Projects' has not been designed for the upfront tariff regime and therefore will not be applicable to projects opting for this upfront tariff.

28. ORDER

In exercise of powers under section 7 (3) (a) read with section 31 (4) of the Act, the Authority hereby determines and approves the following upfront tariffs, for generation of electricity from small hydro power generation, for delivery of electricity to the power purchaser:

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A) Applicable to low-head hydropower projects with head of 20 meters and below:

REFERENCE TARIFF ON BOOT BASIS

	With 100% foreign debt		With 100% local debt	
	Years 1 to10 (Rs. /kWh)	Years 11 to 30 (Rs. /kWh)	Years 1 to10 (Rs. /kWh)	Years 11 to 30 (Rs. /kWh)
Energy Charge				
Variable O & M				
- Local	0.1299	0.1299	0.1299	0.1299
- Foreign	0.1299	0.1299	0.1299	0.1299
Capacity Charge				
Fixed O & M				
- Local	0.6233	0.6233	0.6233	0.6233
- Foreign	0.1558	0.1558	0.1558	0.1558
Insurance	0.5911	0.5911	0.5911	0.5911
Return on equity	3.0318	3.0910	3.3906	3.4569
Debt servicing	5.5799	-	8.9756	-
Total tariff	10.2416	4.7210	13.9962	5.0869

Levelised tariff		
- Rs. /kWh	8.3194	10.8941
- US cents/kwh.	8.4461	11.0600

B) Applicable to high-head hydropower projects with head of more than 20 meters:

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REFERENCE TARIFF ON BOOT BASIS

	With 100% foreign debt		With 100% local debt	
	Years 1 to10 (Rs. /kWh)	Years 11 to 30 (Rs. /kWh)	Years 1 to10 (Rs. /kWh)	Years 11 to 30 (Rs. /kWh)
Energy Charge				
Variable O & M				
- Local	0.1183	0.1183	0.1183	0.1183
- Foreign	0.1183	0.1183	0.1183	0.1183
Capacity Charge				
Fixed O & M				
- Local	0.5678	0.5678	0.5678	0.5678
- Foreign	0.1419	0.1419	0.1419	0.1419
Insurance	0.5785	0.5785	0.5785	0.5785
Return on equity	2.7614	2.8154	3.1004	3.1610
Debt servicing	5.0823	-	8.2074	-
Total tariff	9.3685	4.3402	12.8326	4.6858

Levelised tariff		
- Rs. /kWh	7.6177	9.9960
- US cents/kwh.	7.7337	10.1482

C) Summary of indexations applicable on various tariff components is as follows:

	Indexation
Variable O & M	
- Local	CPI (General)
- Foreign	US CPI and PKR/US$
Fixed O & M	
- Local	CPI (General)
- Foreign	US CPI and PKR/US$

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Insurance	PKR/US $	
Return on equity	PKR/US $	
Debt servicing		
	<u>Foreign debt</u>	<u>Local debt</u>
- Principal	PKR/US $	-
- Interest	PKR/US $ & 3 months US $ LIBOR	3 months KIBOR

i) These tariffs are only applicable for small hydro power generation companies (hereinafter referred to as the "companies") meeting the following conditions:

a) Companies with installed capacity of the project, for which upfront tariff is being opted, in the range of 1 MW to 25 MW.

b) Companies recommended by the relevant agency for the grant of upfront tariff on the format attached as Annex-I and having a certificate from the panel of experts of the relevant agency, on the format attached as Annex-II, about the net annual plant factor of their site, based on their proposed installed capacity and long term historical hydrological data of the site.

c) Companies whose proposed plant and machinery is new. The relevant company will provide a certification in this regard and about other requirements of this upfront tariff on the format attached as Annex-III, along with their application to the Authority for acceptance of upfront tariff.

d) Companies who have not already executed a power purchase agreement with the power purchaser for the relevant project or have achieved financial close for the relevant project.

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ii) The plant and machinery of the project, will be certified as new and of international standard by an independent engineer, appointed in accordance with the terms of power purchase agreement before any payment under this tariff is made. The said certificate shall be obtained and retained by the power purchaser.

iii) The choice to opt for this tariff will only be available up to 12 months, from the date of its determination by the Authority.

iv) The up-front tariff granted to any particular company for any particular project, will no longer remain applicable/valid, if financial close is not achieved for the relevant project within 18 months, from the date of decision of the Authority granting upfront tariff for that particular project or a generation license is declined to the relevant company/project.

v) The targeted maximum construction period after financial close is 36 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 36 months of financial close will not invalidate the tariff granted to it.

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

vii) In the above tariff no adjustment for certified emission reductions has been accounted for. However, upon actual realization of carbon credits, the same shall be distributed between the power purchaser and the power producer in accordance with the Policy for Development of Renewable Energy for Power Generation 2006, as amended from time to time.

viii) This upfront tariff would also be available, for hydro power generation companies located outside legal jurisdiction of the Authority, under the provisions of National Electric Power Regulatory Authority Interim Power Procurement (Procedures and Standards) Regulations, 2005.

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ix) This upfront tariff will only be available for green field hydropower projects.

x) This tariff will be applicable for a period of thirty years (30) from the commencement of commercial operations.

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

xii) <u>Hydrological risk</u>

Projects having certified net annual plant factor below 65% for low head projects and below 50% for high head projects, after allowing auxiliary consumption @ 1% on gross installed capacity, will not be eligible for transfer of hydrological risk to the power purchaser.

The eligible projects will have one-time irrevocable option, at the time of opting for upfront tariff, to bear hydrological risk or to transfer this risk to the power purchaser.

In cases where hydrological risk is borne by the power purchaser, the company shall receive an assured minimum amount every month from the power purchaser to cover its fixed costs (fixed O&M, insurance, return on equity and debt servicing) in case the plant is available but sufficient water i.e. at least equal to the average historic hydrology for that particular month is not available to generate electricity. Payment on account of hydrological risk shall be made by the power purchaser, on the basis of benchmark monthly energy generation, based on the average historic hydrology for that particular month. Further, the tariff will be limited to the extent of benchmark net annual energy generation of the project; while net annual energy generation supplied to the power purchaser in a year, in excess of the benchmark net annual energy generation will be charged at 10% of the prevailing upfront tariff. The power purchaser before signing the Power Purchase Agreement should verify the month wise benchmark hydrology.

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Power producers opting to bear hydrology risk will be allowed to sell all power at the prevailing upfront tariff.

xiii) Adjustment on account of savings in cost of debt

This upfront tariff has been worked out on the basis of 3 months LIBOR of 0.22695% plus a premium of 450 basis points for foreign financing and 3 months KIBOR of 10.17% plus a premium of 300 basis points for local financing. In case spread negotiated is less than the said limits, the savings in the premium over KIBOR/LIBOR 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 commercial operations date of the relevant company/project. In case the premium on KIBOR/LIBOR is higher than that mentioned above, no adjustment on the basis of actual higher premium will be allowed.

The Authority has assessed interest during construction as follows:

	Low head hydropower projects		High head hydropower projects	
	With 100% foreign debt	With 100% local debt	With 100% foreign debt	With 100% local debt
	US $ in millions per MW		US $ in millions per MW	
Interest during construction	0.193	0.568	0.136	0.408

The interest during construction will be reassessed at commercial operations date with actual LIBOR/KIBOR and spread as detailed above.

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xiv) Adjustment on account of Sinosure fees

For projects having foreign financing from Chinese banks, Sinosure fees will be allowed at actual, not exceeding 7% of the total benchmark or actual Chinese debt, whichever is lower. In case the sponsors manage better alternative Sinosure arrangement, the same will be considered at the time of allowing adjustment for Sinosure fees. The power producer, if it intends to claim Sinosure fees, shall submit relevant authentic documentary evidence to the Authority, within 15 days of commercial operations date of the relevant company/project.

xv) Adjustment on account of actual plant factor

The above tariff has been worked out, after allowing auxiliary consumption @ 1% on gross installed capacity, on the following plant factors:

	Annual plant factor
Low-head hydropower projects with head of 20 meters and below	65%
High-head hydropower projects with head of more than 20 meters	50%

This tariff will be adjusted based on actual certified net annual plant factor, if actual certified net annual plant factor of the site is above 65% for low head hydropower projects and above 50% for high head hydropower projects.

For companies opting for upfront tariff without finalisation of their detailed project design, the power producer shall submit request for onetime adjustment, within 15 days of the commercial operations date of the relevant company/project, accompanied by the revised panel of experts certificate regarding net annual plant factor, on the basis of

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detailed project design. Other terms and conditions of the upfront tariff, including for installed capacity and net annual plant factor will remain applicable. For projects which have already opted for upfront tariff on the basis of detailed project design, this onetime adjustment will not be applicable.

xvi) <u>Adjustment for loan structure</u>

The company will have to provide its proposed loan structure to the Authority, along with its application opting for upfront tariff. The Authority will allow tariff to the company on the basis of its proposed loan structure. The tariff once allowed (i.e. on the basis of 100% foreign loan, 100% local loan or mixture of foreign and local loan) will not be subject to any further change, regardless of any subsequent change(s) in the financing structure, etc., except for the adjustment in accordance with the onetime adjustment mechanism detailed herein, where applicable, and the application of relevant indexations/adjustment as detailed in this order.

Tariffs detailed in this order have been calculated on the basis of project financing structure of equity plus 100% foreign loan and equity plus 100% local loan. For proposed loan composition other than the one mentioned above i.e. 100% foreign/local, the Authority after consideration will allow a two part tariff on the basis of request as follows:

Part 1	=	Tariff calculated on the basis of project financing structure of equity plus 100% foreign loan x Foreign debt of the relevant company as a percentage of its total debt
Part 2	=	Tariff calculated on the basis of project financing structure of equity plus 100% local loan x Local debt of the relevant company as a percentage of its total debt

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All the terms and conditions detailed in this order will, with due alteration of details, also apply to two part tariff, as detailed above, allowed to any company.

xvii) Pass-Through Items

If the company is obligated to pay any tax on its income from generation of electricity from small hydro, or water use charges/IRSA charges/other such levies or charges, not being of refundable nature, are payable by the company for generation of electricity from small hydro or any duties and/or taxes, not being of refundable nature, are imposed on the company upto 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/levies/charges 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., will be allowed. Further, withholding tax on dividend will also not be allowed as a pass through item.

xviii) Onetime adjustment on local loan for PKR / US $ exchange rate variation

The principal amount of local loan for quarter 1 (as indicated in Annex-V B and Annex-VII B) will be adjusted for exchange rate variation, after commercial operations date of the relevant company/project, in accordance with the onetime adjustment mechanism stipulated below:

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$$P_{(LFIN)} = (P_{(LREF)} \times 60\%) + (P_{(LREF)} \times 40\% \times ER_{(REV)} / ER_{(REF)})$$

Where:

$P_{(LFIN)}$	=	The revised principal amount for the first quarter after allowing onetime adjustment for exchange rate parity
$P_{(LREF)}$	=	The reference principal amount (as indicated in Annex-V B and Annex-VII B) for the first quarter
$ER_{(REV)}$	=	The average, for a period of 540 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. 98.50

After the revision of principal amount of quarter 1, in accordance with the onetime adjustment mechanism stipulated above, the debt service schedule at Annex-V B and Annex-VII B will be recalculated, on the same computation basis as already adopted, and revised principal repayment of debt and interest tariff components will be worked out for subsequent indexations, where applicable.

xix) <u>Indexations/adjustment</u>

The tariff allowed to any company, after onetime adjustment where applicable, will remain unchanged throughout the tariff control period, except for the adjustments due to indexations/adjustment detailed in this order. The indexations of O & M, return on equity, principal repayment of debt and interest will be allowed on quarterly basis on 1st July, 1st October, 1st January and 1st April. Insurance component will be adjusted annually.

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The mode of indexations/adjustment will be as under:

a) Indexations applicable to O & M:

$VOM_{(LREV)} = VOM_{(LREF)} * CPI\text{-}G_{(REV)} / CPI\text{-}G_{(REF)}$

$VOM_{(FREV)} = VOM_{(FREF)} * US\ CPI_{(REV)} / US\ CPI_{(REF)} * ER_{(REV)} / ER_{(REF)}$

$FOM_{(LREV)} = FOM_{(LREF)} * CPI\text{-}G_{(REV)} / CPI\text{-}G_{(REF)}$

$FOM_{(FREV)} = FOM_{(FREF)} * US\ CPI_{(REV)} / US\ CPI_{(REF)} * ER_{(REV)} / ER_{(REF)}$

Where:

$VOM_{(LREV)}$	=	The revised applicable variable O & M local component of tariff
$VOM_{(FREV)}$	=	The revised applicable variable O & M foreign component of tariff
$FOM_{(LREV)}$	=	The revised applicable fixed O & M local component of tariff
$FOM_{(FREV)}$	=	The revised applicable fixed O & M foreign component of tariff
$VOM_{(LREF)}$	=	The reference variable O & M local component of tariff for the relevant period
$VOM_{(FREF)}$	=	The reference variable O & M foreign component of tariff for the relevant period
$FOM_{(LREF)}$	=	The reference fixed O & M local component of tariff for the relevant period

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$FOM_{(FREF)}$	=	The reference fixed O & M foreign component of tariff for the relevant period
CPI-G $_{(REV)}$	=	The revised Consumer Price Index (General) based on latest available information with respect to Consumer Price Index (General) as notified by the Pakistan Bureau of Statistics
US CPI $_{(REV)}$	=	The revised US CPI (all urban consumers) based on latest available information with respect to US CPI (notified by US Bureau of Labor Statistics)
$ER_{(REV)}$	=	Revised TT & OD selling rate of US Dollar as notified by the National Bank of Pakistan as at the last day of the preceding quarter
CPI-G $_{(REF)}$	=	Reference Consumer Price Index (General) - Current reference 193.55 Consumer Price Index (General) for the month of May 2014 as notified by the Pakistan Bureau of Statistics
US CPI $_{(REF)}$	=	Reference US CPI (all urban consumers) – Current reference 237.900 US CPI (all urban consumers) for the month of May 2014 as notified by the US Bureau of Labor Statistics
$ER_{(REF)}$	=	Reference TT & OD selling rate of US dollar – current reference 98.50

b) <u>Adjustment of insurance component</u>

In case of insurance denominated in US $, insurance cost component of tariff will be adjusted only on account of US $/PKR exchange rate variation annually, not exceeding the insurance cost actually incurred.

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For availing this adjustment, relevant company will have to substantiate through authentic documentary evidence that the insurance cost allowed to it (from COD to date) does not exceed the insurance cost actually incurred.

c) Indexations applicable to return on equity

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

Where:

$ROE_{(REV)}$	=	The revised applicable return on equity tariff component indexed with exchange rate parity
$ROE_{(REF)}$	=	The reference return on equity tariff component for the relevant period
$ER_{(REV)}$	=	Revised TT & OD selling rate of US Dollar as notified by the National Bank of Pakistan as at the last day of the preceding quarter
$ER_{(REF)}$	=	Reference TT & OD selling rate of US dollar – current reference 98.50

d) Indexations applicable to foreign debt

Foreign debt and its interest will be adjusted on quarterly basis, on account of revised TT & OD selling rate of US Dollar, as notified by the National Bank of Pakistan as at the last day of the preceding quarter, over the applicable reference exchange rate.

e) Indexation applicable to foreign interest

$$\Delta I = P_{(REV)} * (LIBOR_{(REV)} - 0.22695\%) / 4$$

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Where:

ΔI = The variation in interest charges applicable corresponding to variation in 3 months LIBOR. ΔI can be positive or negative depending upon whether 3 months LIBOR $_{(Rev)}$ per annum > or < 0.22695%. The interest payment obligation will be enhanced or reduced to the extent of ΔI for each quarter under adjustment.

$P_{(REV)}$ = is the outstanding principal (as indicated in the attached debt service schedule to this order at Annex-IV B/VI B), on a quarterly basis at the relevant quarterly calculations date. Quarter 1 shall commence on the commercial operations date (i.e. the first figure will be used for calculation purposes of interest for the first quarter after COD).

$LIBOR_{(REV)}$ = Revised 3 months US $ LIBOR as at the last day of the preceding quarter

f) <u>Indexation applicable to local interest</u>

$$\Delta I = P_{(REV)} * (KIBOR_{(REV)} - 10.17\%) / 4$$

Where:

ΔI = The variation in interest charges applicable corresponding to variation in 3 months KIBOR. ΔI can be positive or negative depending upon whether 3 months KIBOR $_{(Rev)}$ per annum > or < 10.17%. The interest payment obligation will be enhanced or reduced to the extent of ΔI for each quarter under adjustment.

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$P_{(REV)}$	=	is the revised outstanding principal (as indicated in the attached debt service schedule to this order at Annex-V B/VII B), after allowing onetime adjustment for exchange rate parity, on a quarterly basis at the relevant quarterly calculations date. Quarter 1 shall commence on the commercial operations date (i.e. the first figure will be used for calculation purposes of interest for the first quarter after COD).
$KIBOR_{(REV)}$	=	Revised 3 months KIBOR as at the last day of the preceding quarter

Note:

Above described indexations/adjustment will be approved and announced by the Authority within fifteen days of the company's request for indexations/adjustment in tariff in accordance with the requisite mechanisms stipulated herein.

xx) <u>Other Terms and Conditions of Tariff:</u>

a) Design & Manufacturing Standards:

Small hydro power generation system shall be designed, manufactured and tested in accordance with the latest ASME, ANSI, IEC standards or other equivalent standards. All plant and equipment shall be new.

b) Power curve of the hydro power complex:

The power curve of the hydro power plant shall be verified by the power purchaser, as part of the commissioning tests, according to the latest IEC standards and shall be used to measure the performance of the hydro generating units.

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c) **Emissions Trading/ Carbon Credits:**

The company granted this tariff shall process and obtain emissions/carbon credits expeditiously and credit the proceeds to the power purchaser in accordance with the Policy for Development of Renewable Energy for Power Generation 2006, as amended from time to time.

d) General:

- The power purchaser before signing the Power Purchase Agreement shall satisfy itself that the plant and machinery proposed to be installed is new and is of an acceptable quality.

- The projects allowed upfront tariff will be transferred, at the end of tariff control period of 30 years, to the power purchaser/relevant Government at a notional price of Rs. 1.

- The Power Purchase Agreement should stipulate terms and conditions, regarding periodic physical inspection of plant and machinery, ensuring that the power plant of the company allowed this tariff is properly maintained and continues to supply energy for the entire tariff control period of 30 years.

- Pre COD sale of electricity is allowed to the power producer, subject to the terms and conditions of Power Purchase Agreement, at the applicable tariff excluding principal repayment of debt component and interest component. However, pre COD sale will not alter the required commercial operations date stipulated by the Power Purchase Agreement in any manner.

- General assumptions, which are not covered in this determination and National Electric Power Regulatory

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Authority Upfront Tariff (Approval & Procedure) Regulations, 2011, may be dealt with as per the standard terms of the Power Purchase Agreement.

29. The above Order of the Authority, along with Annexes I to VII B, 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

02.4.15
(Khawaja Muhammad Naeem)
Member

2/4/15
(Maj. (R) Haroon Rashid)
Member

2.4.15
(Himayat Ullah Khan)
Member

2/4/2015
(Habibullah Khilji)
Vice Chairman

Brigadier (R) Tariq Saddozai
Chairman 2/4/15

02.04.15

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[On letter head of relevant agency]

Annexure - I

Date: -------------------

The Registrar,
National Electric Power Regulatory Authority,
Islamabad

SUBJECT:— Recommendation for grant of upfront tariff

1. We hereby recommend [NAME OF THE COMPANY], for the grant of upfront tariff, as approved by the National Electric Power Regulatory Authority *vide* its determination dated [DATE OF THE UPFRONT TARIFF DETERMINATION], for its project of [GROSS INSTALLED CAPACITY OF THE PROJECT] MW installed capacity to be located at [ADDRESS OF THE PROJECT SITE].

2. We further confirm that our panel of experts has provided certificate regarding net annual plant factor of [NAME OF THE COMPANY] for its project of [GROSS INSTALLED CAPACITY OF THE PROJECT] MW installed capacity to be located at [ADDRESS OF THE PROJECT SITE] on the prescribed format vide letter no. ___________ dated: ________ which is enclosed for consideration of the Authority.

Signature: ____________________

Name: ____________________

Dated: ____________________

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Annexure - II

Date: ____________

The Registrar,
National Electric Power Regulatory Authority,
Islamabad

SUBJECT:— Certificate Regarding Annual Plant Factor

1. We the panel of experts of [NAME OF RELEVANT AGENCY] have been required by [NAME OF RELEVANT AGENCY] to provide our expert opinion regarding small hydropower project of [NAME OF THE COMPANY].

2. Based on the proposed installed capacity/installed capacity as per the detailed design [DELETE WHICHEVER IS INAPPLICABLE] and long term historical hydrological site data, our findings are as follows:

Name of the company	:	
Address of project site	:	
Gross head [meters]	:	
Net head [meters]	:	
Gross plant installed capacity [MW] - **A**	:	
Auxiliary consumption @ 1% - **B**	:	
Net plant installed capacity [MW] - **C = A - B** (to be used for computation of net annual plant factor)	:	
Net deliverable energy per annum [Gwh.] - **D**	:	
Net annual plant factor based on net deliverable energy [(D x 1,000) / (C x 24 x 365) x 100]	:	

Monthly benchmark hydrology [m^3/s]:

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total

Monthly benchmark net deliverable energy [GWh.]:

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total

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3. We hereby confirm that the net annual plant factor as detailed above, may be used for allowing upfront tariff, to the aforesaid company for the project site detailed above*, and our above findings may be made a basis for making hydrological risk payments, if any, by the power purchaser* [UNDERLINED PART TO BE DELETED IF DETAILED DESIGN IS NOT AVAILABLE].

[TO BE SIGNED AND DATED BY ALL MEMBERS OF THE PANEL OF EXPERTS. COMPLETE NAMES AND PARTICULARS OF ALL THE SIGNATORIES SHOULD ALSO BE INCLUDED]

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Annexure - III

Date: ____________

The Registrar,
National Electric Power Regulatory Authority,
Islamabad

SUBJECT:— Certifications in respect of application opting for upfront tariff for small hydropower generation

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 [GROSS INSTALLED 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 it is a green field hydro power project.

2. [NAME OF APPLICANT COMPANY] will/will not [DELETE WHICHEVER IS INAPPLICABLE] bear the hydrological risk.

3. The net annual plant factor of the aforementioned project, as certified by the panel of experts, is based / not based [DELETE WHICHEVER IS INAPPLICABLE] on the detailed design report.

4. We have not already executed a power purchase agreement with the power purchaser for the aforementioned project or have achieved financial close for the aforementioned project.

5. [NAME OF APPLICANT COMPANY] may be granted upfront tariff based on the following loan structure:

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		%
Foreign loan		
Local loan		
	TOTAL	100

Date:____________________

Signature:________________________

Name: ________________________

Designation:________________________

Company Stamp

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Annex-IV A

UPFRONT TARIFF FOR LOW HEAD HYDROPOWER PROJECTS (1 TO 25 MW) BASED ON 100% FOREIGN FINANCING REFERENCE TARIFF

Year	Energy Charge		Capacity Charge						Total Tariff
	Variable O&M Local	Variable O&M Foreign	Fixed O&M Local	Fixed O&M Foreign	Insurance	Return on Equity (ROE)	Pricipal Repayment	Interest	
	Rs./kWh	Rs./kWh	Rs./kWh	Rs./kWh	Rs./kWh	Rs./kWh	Rs./kWh	Rs./kWh	Rs./kWh
1	0.1299	0.1299	0.6233	0.1558	0.5911	3.0318	3.5500	2.0299	10.2416
2	0.1299	0.1299	0.6233	0.1558	0.5911	3.0318	3.7208	1.8591	10.2416
3	0.1299	0.1299	0.6233	0.1558	0.5911	3.0318	3.8998	1.6800	10.2416
4	0.1299	0.1299	0.6233	0.1558	0.5911	3.0318	4.0875	1.4924	10.2416
5	0.1299	0.1299	0.6233	0.1558	0.5911	3.0318	4.2841	1.2957	10.2416
6	0.1299	0.1299	0.6233	0.1558	0.5911	3.0318	4.4903	1.0896	10.2416
7	0.1299	0.1299	0.6233	0.1558	0.5911	3.0318	4.7063	0.8736	10.2416
8	0.1299	0.1299	0.6233	0.1558	0.5911	3.0318	4.9328	0.6471	10.2416
9	0.1299	0.1299	0.6233	0.1558	0.5911	3.0318	5.1701	0.4098	10.2416
10	0.1299	0.1299	0.6233	0.1558	0.5911	3.0318	5.4188	0.1610	10.2416
11	0.1299	0.1299	0.6233	0.1558	0.5911	3.0910	-	-	4.7210
12	0.1299	0.1299	0.6233	0.1558	0.5911	3.0910	-	-	4.7210
13	0.1299	0.1299	0.6233	0.1558	0.5911	3.0910	-	-	4.7210
14	0.1299	0.1299	0.6233	0.1558	0.5911	3.0910	-	-	4.7210
15	0.1299	0.1299	0.6233	0.1558	0.5911	3.0910	-	-	4.7210
16	0.1299	0.1299	0.6233	0.1558	0.5911	3.0910	-	-	4.7210
17	0.1299	0.1299	0.6233	0.1558	0.5911	3.0910	-	-	4.7210
18	0.1299	0.1299	0.6233	0.1558	0.5911	3.0910	-	-	4.7210
19	0.1299	0.1299	0.6233	0.1558	0.5911	3.0910	-	-	4.7210
20	0.1299	0.1299	0.6233	0.1558	0.5911	3.0910	-	-	4.7210
21	0.1299	0.1299	0.6233	0.1558	0.5911	3.0910	-	-	4.7210
22	0.1299	0.1299	0.6233	0.1558	0.5911	3.0910	-	-	4.7210
23	0.1299	0.1299	0.6233	0.1558	0.5911	3.0910	-	-	4.7210
24	0.1299	0.1299	0.6233	0.1558	0.5911	3.0910	-	-	4.7210
25	0.1299	0.1299	0.6233	0.1558	0.5911	3.0910	-	-	4.7210
26	0.1299	0.1299	0.6233	0.1558	0.5911	3.0910	-	-	4.7210
27	0.1299	0.1299	0.6233	0.1558	0.5911	3.0910	-	-	4.7210
28	0.1299	0.1299	0.6233	0.1558	0.5911	3.0910	-	-	4.7210
29	0.1299	0.1299	0.6233	0.1558	0.5911	3.0910	-	-	4.7210
30	0.1299	0.1299	0.6233	0.1558	0.5911	3.0910	-	-	4.7210
Levelized Tariff	**0.1299**	**0.1299**	**0.6233**	**0.1558**	**0.5911**	**3.0524**	**2.7811**	**0.8559**	**8.3194**

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Annex-IV B

UPFRONT TARIFF FOR LOW HEAD HYDROPOWER PROJECTS (1 TO 25 MW) BASED ON 100% FOREIGN FINANCING

Debt Servicing Schedule for the Purpose of Indexation of Debt Component Only

Period	Foreign Debt					Annual Principal Repayment Rs./kWh	Annual Interest Rs./kWh	Annual Debt Servicing Rs./kWh
	Principal Million Rs.	Repayment Million Rs.	Mark-Up Million Rs.	Balance Million Rs.	Debt Service Million Rs.			
	249.50	4.92	2.95	244.58	7.86			
	244.58	4.97	2.89	239.61	7.86			
	239.61	5.03	2.83	234.58	7.86			
	234.58	5.09	2.77	229.49	7.86			
1	249.50	20.01	11.44	229.49	31.45	3.5500	2.0299	5.5799
	229.49	5.15	2.71	224.34	7.86			
	224.34	5.21	2.65	219.12	7.86			
	219.12	5.27	2.59	213.85	7.86			
	213.85	5.34	2.53	208.51	7.86			
2	229.49	20.97	10.48	208.51	31.45	3.7208	1.8591	5.5799
	208.51	5.40	2.46	203.11	7.86			
	203.11	5.46	2.40	197.65	7.86			
	197.65	5.53	2.34	192.12	7.86			
	192.12	5.59	2.27	186.53	7.86			
3	208.51	21.98	9.47	186.53	31.45	3.8998	1.6800	5.5799
	186.53	5.66	2.20	180.87	7.86			
	180.87	5.73	2.14	175.14	7.86			
	175.14	5.79	2.07	169.35	7.86			
	169.35	5.86	2.00	163.49	7.86			
4	186.53	23.04	8.41	163.49	31.45	4.0875	1.4924	5.5799
	163.49	5.93	1.93	157.56	7.86			
	157.56	6.00	1.86	151.56	7.86			
	151.56	6.07	1.79	145.48	7.86			
	145.48	6.14	1.72	139.34	7.86			
5	163.49	24.15	7.30	139.34	31.45	4.2841	1.2957	5.5799
	139.34	6.22	1.65	133.12	7.86			
	133.12	6.29	1.57	126.83	7.86			
	126.83	6.36	1.50	120.47	7.86			
	120.47	6.44	1.42	114.03	7.86			
6	139.34	25.31	6.14	114.03	31.45	4.4903	1.0896	5.5799
	114.03	6.52	1.35	107.51	7.86			
	107.51	6.59	1.27	100.92	7.86			
	100.92	6.67	1.19	94.25	7.86			
	94.25	6.75	1.11	87.50	7.86			
7	114.03	26.53	4.92	87.50	31.45	4.7063	0.8736	5.5799
	87.50	6.83	1.03	80.67	7.86			
	80.67	6.91	0.95	73.76	7.86			
	73.76	6.99	0.87	66.76	7.86			
	66.76	7.07	0.79	59.69	7.86			
8	87.50	27.81	3.65	59.69	31.45	4.9328	0.6471	5.5799
	59.69	7.16	0.71	52.53	7.86			
	52.53	7.24	0.62	45.29	7.86			
	45.29	7.33	0.54	37.96	7.86			
	37.96	7.41	0.45	30.55	7.86			
9	59.69	29.14	2.31	30.55	31.45	5.1701	0.4098	5.5799
	30.55	7.50	0.36	23.04	7.86			
	23.04	7.59	0.27	15.45	7.86			
	15.45	7.68	0.18	7.77	7.86			
	7.77	7.77	0.09	(0.00)	7.86			
10	30.55	30.55	0.91	-	31.45	5.4188	0.1610	5.5799

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Annex-V A

UPFRONT TARIFF FOR LOW HEAD HYDROPOWER PROJECTS (1 TO 25 MW) BASED ON 100% LOCAL FINANCING
REFERENCE TARIFF

	Energy Charge		Capacity Charge						
Year	Variable O&M Local	Variable O&M Foreign	Fixed O&M Local	Fixed O&M Foreign	Insurance	Return on Equity (ROE)	Principal Repayment	Interest	Total Tariff
	Rs./kWh	Rs./kWh	Rs./kWh	Rs./kWh	Rs./kWh	Rs./kWh	Rs./kWh	Rs./kWh	Rs./kWh
1	0.1299	0.1299	0.6233	0.1558	0.5911	3.3906	2.5805	6.3951	13.9962
2	0.1299	0.1299	0.6233	0.1558	0.5911	3.3906	2.9375	6.0381	13.9962
3	0.1299	0.1299	0.6233	0.1558	0.5911	3.3906	3.3439	5.6317	13.9962
4	0.1299	0.1299	0.6233	0.1558	0.5911	3.3906	3.8065	5.1691	13.9962
5	0.1299	0.1299	0.6233	0.1558	0.5911	3.3906	4.3331	4.6425	13.9962
6	0.1299	0.1299	0.6233	0.1558	0.5911	3.3906	4.9326	4.0430	13.9962
7	0.1299	0.1299	0.6233	0.1558	0.5911	3.3906	5.6150	3.3606	13.9962
8	0.1299	0.1299	0.6233	0.1558	0.5911	3.3906	6.3918	2.5838	13.9962
9	0.1299	0.1299	0.6233	0.1558	0.5911	3.3906	7.2761	1.6995	13.9962
10	0.1299	0.1299	0.6233	0.1558	0.5911	3.3906	8.2828	0.6928	13.9962
11	0.1299	0.1299	0.6233	0.1558	0.5911	3.4569	-	-	5.0869
12	0.1299	0.1299	0.6233	0.1558	0.5911	3.4569	-	-	5.0869
13	0.1299	0.1299	0.6233	0.1558	0.5911	3.4569	-	-	5.0869
14	0.1299	0.1299	0.6233	0.1558	0.5911	3.4569	-	-	5.0869
15	0.1299	0.1299	0.6233	0.1558	0.5911	3.4569	-	-	5.0869
16	0.1299	0.1299	0.6233	0.1558	0.5911	3.4569	-	-	5.0869
17	0.1299	0.1299	0.6233	0.1558	0.5911	3.4569	-	-	5.0869
18	0.1299	0.1299	0.6233	0.1558	0.5911	3.4569	-	-	5.0869
19	0.1299	0.1299	0.6233	0.1558	0.5911	3.4569	-	-	5.0869
20	0.1299	0.1299	0.6233	0.1558	0.5911	3.4569	-	-	5.0869
21	0.1299	0.1299	0.6233	0.1558	0.5911	3.4569	-	-	5.0869
22	0.1299	0.1299	0.6233	0.1558	0.5911	3.4569	-	-	5.0869
23	0.1299	0.1299	0.6233	0.1558	0.5911	3.4569	-	-	5.0869
24	0.1299	0.1299	0.6233	0.1558	0.5911	3.4569	-	-	5.0869
25	0.1299	0.1299	0.6233	0.1558	0.5911	3.4569	-	-	5.0869
26	0.1299	0.1299	0.6233	0.1558	0.5911	3.4569	-	-	5.0869
27	0.1299	0.1299	0.6233	0.1558	0.5911	3.4569	-	-	5.0869
28	0.1299	0.1299	0.6233	0.1558	0.5911	3.4569	-	-	5.0869
29	0.1299	0.1299	0.6233	0.1558	0.5911	3.4569	-	-	5.0869
30	0.1299	0.1299	0.6233	0.1558	0.5911	3.4569	-	-	5.0869
Levelized Tariff	**0.1299**	**0.1299**	**0.6233**	**0.1558**	**0.5911**	**3.4137**	**2.9175**	**2.9329**	**10.8941**

Annex-V B

UPFRONT TARIFF FOR LOW HEAD HYDROPOWER PROJECTS (1 TO 25 MW) BASED ON 100% LOCAL FINANCING

Debt Servicing Schedule for the Purpose of Indexation of Debt Component Only

	Local Debt					Annual Principal Repayment Rs./kWh	Annual Interest Rs./kWh	Annual Debt Servicing Rs./kWh
Period	Principal Million Rs.	Repayment Million Rs.	Mark-Up Million Rs.	Balance Million Rs.	Debt Service Million Rs.			
	279.03	3.46	9.19	275.57	12.65			
	275.57	3.58	9.07	272.00	12.65			
	272.00	3.69	8.96	268.30	12.65			
	268.30	3.82	8.83	264.49	12.65			
1	279.03	14.55	36.05	264.49	50.60	2.5805	6.3951	8.9756
	264.49	3.94	8.71	260.55	12.65			
	260.55	4.07	8.58	256.48	12.65			
	256.48	4.20	8.44	252.27	12.65			
	252.27	4.34	8.31	247.93	12.65			
2	264.49	16.56	34.04	247.93	50.60	2.9375	6.0381	8.9756
	247.93	4.49	8.16	243.44	12.65			
	243.44	4.63	8.02	238.81	12.65			
	238.81	4.79	7.86	234.02	12.65			
	234.02	4.94	7.71	229.08	12.65			
3	247.93	18.85	31.75	229.08	50.60	3.3439	5.6317	8.9756
	229.08	5.11	7.54	223.97	12.65			
	223.97	5.27	7.37	218.70	12.65			
	218.70	5.45	7.20	213.25	12.65			
	213.25	5.63	7.02	207.62	12.65			
4	229.08	21.46	29.14	207.62	50.60	3.8065	5.1691	8.9756
	207.62	5.81	6.84	201.81	12.65			
	201.81	6.00	6.64	195.80	12.65			
	195.80	6.20	6.45	189.60	12.65			
	189.60	6.41	6.24	183.20	12.65			
5	207.62	24.43	26.17	183.20	50.60	4.3331	4.6425	8.9756
	183.20	6.62	6.03	176.58	12.65			
	176.58	6.84	5.81	169.74	12.65			
	169.74	7.06	5.59	162.68	12.65			
	162.68	7.29	5.36	155.39	12.65			
6	183.20	27.81	22.79	155.39	50.60	4.9326	4.0430	8.9756
	155.39	7.53	5.12	147.86	12.65			
	147.86	7.78	4.87	140.08	12.65			
	140.08	8.04	4.61	132.04	12.65			
	132.04	8.30	4.35	123.74	12.65			
7	155.39	31.65	18.94	123.74	50.60	5.6150	3.3606	8.9756
	123.74	8.57	4.07	115.16	12.65			
	115.16	8.86	3.79	106.31	12.65			
	106.31	9.15	3.50	97.16	12.65			
	97.16	9.45	3.20	87.71	12.65			
8	123.74	36.03	14.56	87.71	50.60	6.3918	2.5838	8.9756
	87.71	9.76	2.89	77.95	12.65			
	77.95	10.08	2.57	67.86	12.65			
	67.86	10.41	2.23	57.45	12.65			
	57.45	10.76	1.89	46.69	12.65			
9	87.71	41.02	9.58	46.69	50.60	7.2761	1.6995	8.9756
	46.69	11.11	1.54	35.58	12.65			
	35.58	11.48	1.17	24.10	12.65			
	24.10	11.86	0.79	12.25	12.65			
	12.25	12.25	0.40	0.00	12.65			
10	46.69	46.69	3.91	0.00	50.60	8.2828	0.6928	8.9756

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UPFRONT TARIFF FOR HIGH HEAD HYDROPOWER PROJECTS (1 TO 25 MW) BASED ON 100% FOREIGN FINANCING
REFERENCE TARIFF

Year	Energy Charge		Capacity Charge						
	Variable O&M Local	Variable O&M Foreign	Fixed O&M Local	Fixed O&M Foreign	Insurance	Return on Equity (ROE)	Principal Repayment	Interest	Total Tariff
	Rs./kWh	Rs./kWh	Rs./kWh	Rs./kWh	Rs./kWh	Rs./kWh	Rs./kWh	Rs./kWh	Rs./kWh
1	0.1183	0.1183	0.5678	0.1419	0.5785	2.7614	3.2335	1.8489	9.3685
2	0.1183	0.1183	0.5678	0.1419	0.5785	2.7614	3.3890	1.6933	9.3685
3	0.1183	0.1183	0.5678	0.1419	0.5785	2.7614	3.5521	1.5302	9.3685
4	0.1183	0.1183	0.5678	0.1419	0.5785	2.7614	3.7230	1.3593	9.3685
5	0.1183	0.1183	0.5678	0.1419	0.5785	2.7614	3.9021	1.1802	9.3685
6	0.1183	0.1183	0.5678	0.1419	0.5785	2.7614	4.0899	0.9924	9.3685
7	0.1183	0.1183	0.5678	0.1419	0.5785	2.7614	4.2867	0.7957	9.3685
8	0.1183	0.1183	0.5678	0.1419	0.5785	2.7614	4.4929	0.5894	9.3685
9	0.1183	0.1183	0.5678	0.1419	0.5785	2.7614	4.7091	0.3732	9.3685
10	0.1183	0.1183	0.5678	0.1419	0.5785	2.7614	4.9356	0.1467	9.3685
11	0.1183	0.1183	0.5678	0.1419	0.5785	2.8154	-	-	4.3402
12	0.1183	0.1183	0.5678	0.1419	0.5785	2.8154	-	-	4.3402
13	0.1183	0.1183	0.5678	0.1419	0.5785	2.8154	-	-	4.3402
14	0.1183	0.1183	0.5678	0.1419	0.5785	2.8154	-	-	4.3402
15	0.1183	0.1183	0.5678	0.1419	0.5785	2.8154	-	-	4.3402
16	0.1183	0.1183	0.5678	0.1419	0.5785	2.8154	-	-	4.3402
17	0.1183	0.1183	0.5678	0.1419	0.5785	2.8154	-	-	4.3402
18	0.1183	0.1183	0.5678	0.1419	0.5785	2.8154	-	-	4.3402
19	0.1183	0.1183	0.5678	0.1419	0.5785	2.8154	-	-	4.3402
20	0.1183	0.1183	0.5678	0.1419	0.5785	2.8154	-	-	4.3402
21	0.1183	0.1183	0.5678	0.1419	0.5785	2.8154	-	-	4.3402
22	0.1183	0.1183	0.5678	0.1419	0.5785	2.8154	-	-	4.3402
23	0.1183	0.1183	0.5678	0.1419	0.5785	2.8154	-	-	4.3402
24	0.1183	0.1183	0.5678	0.1419	0.5785	2.8154	-	-	4.3402
25	0.1183	0.1183	0.5678	0.1419	0.5785	2.8154	-	-	4.3402
26	0.1183	0.1183	0.5678	0.1419	0.5785	2.8154	-	-	4.3402
27	0.1183	0.1183	0.5678	0.1419	0.5785	2.8154	-	-	4.3402
28	0.1183	0.1183	0.5678	0.1419	0.5785	2.8154	-	-	4.3402
29	0.1183	0.1183	0.5678	0.1419	0.5785	2.8154	-	-	4.3402
30	0.1183	0.1183	0.5678	0.1419	0.5785	2.8154	-	-	4.3402
Levelized Tariff	**0.1183**	**0.1183**	**0.5678**	**0.1419**	**0.5785**	**2.7802**	**2.5331**	**0.7796**	**7.6177**

NATIONAL ELECTRIC POWER REGULATORY AUTHORITY
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Annex-VI B

UPFRONT TARIFF FOR HIGH HEAD HYDROPOWER PROJECTS (1 TO 25 MW) BASED ON 100% FOREIGN FINANCING

Debt Servicing Schedule for the Purpose of Indexation of Debt Component Only

Period	Foreign Debt Principal Million Rs.	Repayment Million Rs.	Mark-Up Million Rs.	Balance Million Rs.	Debt Service Million Rs.	Annual Principal Repayment Rs./kWh	Annual Interest Rs./kWh	Annual Debt Servicing Rs./kWh
	174.81	3.44	2.07	171.37	5.51			
	171.37	3.48	2.03	167.88	5.51			
	167.88	3.53	1.98	164.36	5.51			
	164.36	3.57	1.94	160.79	5.51			
1	174.81	14.02	8.02	160.79	22.04	3.2335	1.8489	5.0823
	160.79	3.61	1.90	157.18	5.51			
	157.18	3.65	1.86	153.53	5.51			
	153.53	3.70	1.81	149.83	5.51			
	149.83	3.74	1.77	146.09	5.51			
2	160.79	14.70	7.34	146.09	22.04	3.3890	1.6933	5.0823
	146.09	3.78	1.73	142.31	5.51			
	142.31	3.83	1.68	138.48	5.51			
	138.48	3.87	1.64	134.61	5.51			
	134.61	3.92	1.59	130.69	5.51			
3	146.09	15.40	6.64	130.69	22.04	3.5521	1.5302	5.0823
	130.69	3.97	1.54	126.72	5.51			
	126.72	4.01	1.50	122.71	5.51			
	122.71	4.06	1.45	118.65	5.51			
	118.65	4.11	1.40	114.55	5.51			
4	130.69	16.14	5.89	114.55	22.04	3.7230	1.3593	5.0823
	114.55	4.16	1.35	110.39	5.51			
	110.39	4.20	1.30	106.19	5.51			
	106.19	4.25	1.25	101.93	5.51			
	101.93	4.30	1.20	97.63	5.51			
5	114.55	16.92	5.12	97.63	22.04	3.9021	1.1802	5.0823
	97.63	4.36	1.15	93.27	5.51			
	93.27	4.41	1.10	88.86	5.51			
	88.86	4.46	1.05	84.40	5.51			
	84.40	4.51	1.00	79.89	5.51			
6	97.63	17.73	4.30	79.89	22.04	4.0899	0.9924	5.0823
	79.89	4.57	0.94	75.33	5.51			
	75.33	4.62	0.89	70.71	5.51			
	70.71	4.67	0.84	66.03	5.51			
	66.03	4.73	0.78	61.30	5.51			
7	79.89	18.59	3.45	61.30	22.04	4.2867	0.7957	5.0823
	61.30	4.79	0.72	56.52	5.51			
	56.52	4.84	0.67	51.68	5.51			
	51.68	4.90	0.61	46.78	5.51			
	46.78	4.96	0.55	41.82	5.51			
8	61.30	19.48	2.56	41.82	22.04	4.4929	0.5894	5.0823
	41.82	5.02	0.49	36.81	5.51			
	36.81	5.07	0.43	31.73	5.51			
	31.73	5.13	0.37	26.60	5.51			
	26.60	5.20	0.31	21.40	5.51			
9	41.82	20.42	1.62	21.40	22.04	4.7091	0.3732	5.0823
	21.40	5.26	0.25	16.15	5.51			
	16.15	5.32	0.19	10.83	5.51			
	10.83	5.38	0.13	5.45	5.51			
	5.45	5.45	0.06	-	5.51			
10	21.40	21.40	0.64	-	22.04	4.9356	0.1467	5.0823

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Annex-VII A

UPFRONT TARIFF FOR HIGH HEAD HYDROPOWER PROJECTS (1 TO 25 MW) BASED ON 100% LOCAL FINANCING
REFERENCE TARIFF

	Energy Charge		Capacity Charge						
Year	Variable O&M Local	Variable O&M Foreign	Fixed O&M Local	Fixed O&M Foreign	Insurance	Return on Equity (ROE)	Principal Repayment	Interest	Total Tariff
	Rs./kWh	Rs./kWh	Rs./kWh	Rs./kWh	Rs./kWh	Rs./kWh	Rs./kWh	Rs./kWh	Rs./kWh
1	0.1183	0.1183	0.5678	0.1419	0.5785	3.1004	2.3596	5.8478	12.8326
2	0.1183	0.1183	0.5678	0.1419	0.5785	3.1004	2.6861	5.5213	12.8326
3	0.1183	0.1183	0.5678	0.1419	0.5785	3.1004	3.0577	5.1497	12.8326
4	0.1183	0.1183	0.5678	0.1419	0.5785	3.1004	3.4807	4.7267	12.8326
5	0.1183	0.1183	0.5678	0.1419	0.5785	3.1004	3.9622	4.2451	12.8326
6	0.1183	0.1183	0.5678	0.1419	0.5785	3.1004	4.5104	3.6970	12.8326
7	0.1183	0.1183	0.5678	0.1419	0.5785	3.1004	5.1344	3.0729	12.8326
8	0.1183	0.1183	0.5678	0.1419	0.5785	3.1004	5.8448	2.3626	12.8326
9	0.1183	0.1183	0.5678	0.1419	0.5785	3.1004	6.6534	1.5540	12.8326
10	0.1183	0.1183	0.5678	0.1419	0.5785	3.1004	7.5738	0.6335	12.8326
11	0.1183	0.1183	0.5678	0.1419	0.5785	3.1610	-	-	4.6858
12	0.1183	0.1183	0.5678	0.1419	0.5785	3.1610	-	-	4.6858
13	0.1183	0.1183	0.5678	0.1419	0.5785	3.1610	-	-	4.6858
14	0.1183	0.1183	0.5678	0.1419	0.5785	3.1610	-	-	4.6858
15	0.1183	0.1183	0.5678	0.1419	0.5785	3.1610	-	-	4.6858
16	0.1183	0.1183	0.5678	0.1419	0.5785	3.1610	-	-	4.6858
17	0.1183	0.1183	0.5678	0.1419	0.5785	3.1610	-	-	4.6858
18	0.1183	0.1183	0.5678	0.1419	0.5785	3.1610	-	-	4.6858
19	0.1183	0.1183	0.5678	0.1419	0.5785	3.1610	-	-	4.6858
20	0.1183	0.1183	0.5678	0.1419	0.5785	3.1610	-	-	4.6858
21	0.1183	0.1183	0.5678	0.1419	0.5785	3.1610	-	-	4.6858
22	0.1183	0.1183	0.5678	0.1419	0.5785	3.1610	-	-	4.6858
23	0.1183	0.1183	0.5678	0.1419	0.5785	3.1610	-	-	4.6858
24	0.1183	0.1183	0.5678	0.1419	0.5785	3.1610	-	-	4.6858
25	0.1183	0.1183	0.5678	0.1419	0.5785	3.1610	-	-	4.6858
26	0.1183	0.1183	0.5678	0.1419	0.5785	3.1610	-	-	4.6858
27	0.1183	0.1183	0.5678	0.1419	0.5785	3.1610	-	-	4.6858
28	0.1183	0.1183	0.5678	0.1419	0.5785	3.1610	-	-	4.6858
29	0.1183	0.1183	0.5678	0.1419	0.5785	3.1610	-	-	4.6858
30	0.1183	0.1183	0.5678	0.1419	0.5785	3.1610	-	-	4.6858
Levelized Tariff	**0.1183**	**0.1183**	**0.5678**	**0.1419**	**0.5785**	**3.1215**	**2.6678**	**2.6819**	**9.9960**

NATIONAL ELECTRIC POWER REGULATORY AUTHORITY
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Annex-VII B

UPFRONT TARIFF FOR HIGH HEAD HYDROPOWER PROJECTS (1 TO 25 MW) BASED ON 100% LOCAL FINANCING

Debt Servicing Schedule for the Purpose of Indexation of Debt Component Only

	Local Debt					Annual Principal Repayment Rs./kWh	Annual Interest Rs./kWh	Annual Debt Servicing Rs./kWh
Period	Principal Million Rs.	Repayment Million Rs.	Mark-Up Million Rs.	Balance Million Rs.	Debt Service Million Rs.			
	196.27	2.44	6.46	193.83	8.90			
	193.83	2.52	6.38	191.32	8.90			
	191.32	2.60	6.30	188.72	8.90			
	188.72	2.68	6.21	186.04	8.90			
1	196.27	10.23	25.36	186.04	35.59	2.3596	5.8478	8.2074
	186.04	2.77	6.13	183.27	8.90			
	183.27	2.86	6.03	180.40	8.90			
	180.40	2.96	5.94	177.45	8.90			
	177.45	3.05	5.84	174.39	8.90			
2	186.04	11.65	23.94	174.39	35.59	2.6861	5.5213	8.2074
	174.39	3.16	5.74	171.24	8.90			
	171.24	3.26	5.64	167.98	8.90			
	167.98	3.37	5.53	164.61	8.90			
	164.61	3.48	5.42	161.13	8.90			
3	174.39	13.26	22.33	161.13	35.59	3.0577	5.1497	8.2074
	161.13	3.59	5.31	157.54	8.90			
	157.54	3.71	5.19	153.83	8.90			
	153.83	3.83	5.06	150.00	8.90			
	150.00	3.96	4.94	146.04	8.90			
4	161.13	15.09	20.50	146.04	35.59	3.4807	4.7267	8.2074
	146.04	4.09	4.81	141.95	8.90			
	141.95	4.22	4.67	137.73	8.90			
	137.73	4.36	4.53	133.36	8.90			
	133.36	4.51	4.39	128.86	8.90			
5	146.04	17.18	18.41	128.86	35.59	3.9622	4.2451	8.2074
	128.86	4.65	4.24	124.20	8.90			
	124.20	4.81	4.09	119.40	8.90			
	119.40	4.97	3.93	114.43	8.90			
	114.43	5.13	3.77	109.30	8.90			
6	128.86	19.56	16.03	109.30	35.59	4.5104	3.6970	8.2074
	109.30	5.30	3.60	104.00	8.90			
	104.00	5.47	3.42	98.53	8.90			
	98.53	5.65	3.24	92.88	8.90			
	92.88	5.84	3.06	87.04	8.90			
7	109.30	22.26	13.32	87.04	35.59	5.1344	3.0729	8.2074
	87.04	6.03	2.87	81.00	8.90			
	81.00	6.23	2.67	74.77	8.90			
	74.77	6.44	2.46	68.34	8.90			
	68.34	6.65	2.25	61.69	8.90			
8	87.04	25.34	10.24	61.69	35.59	5.8448	2.3626	8.2074
	61.69	6.87	2.03	54.83	8.90			
	54.83	7.09	1.81	47.73	8.90			
	47.73	7.33	1.57	40.41	8.90			
	40.41	7.57	1.33	32.84	8.90			
9	61.69	28.85	6.74	32.84	35.59	6.6534	1.5540	8.2074
	32.84	7.82	1.08	25.03	8.90			
	25.03	8.07	0.82	16.95	8.90			
	16.95	8.34	0.56	8.61	8.90			
	8.61	8.61	0.28	0.00	8.90			
10	32.84	32.84	2.75	0.00	35.59	7.5738	0.6335	8.2074