



Registrar

National Electric Power Regulatory Authority
Islamic Republic of Pakistan

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No. NEPRA/UTS-2015/17871-17874
December 16, 2015

Subject: Determination of National Electric Power Regulatory Authority in the Matter of Upfront Generation Tariff for Solar PV Power Plants


Dear Sir,

Please find enclosed herewith the subject Determination of the Authority along with Annex-I, Ia, II, IIa, III, IIIa, IV, IVa, V, Va, VI, VIa (46 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. Order of the Authority along with 12 Annexures (Annex-I, Ia, II, IIa, III, IIIa, IV, IVa, V, Va, VI, VIa) needs to be notified in the official Gazette.

Enclosure: As above


(Syed Safer Hussain)¹⁶ 12-15

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

CC:

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

**National Electric Power Regulatory Authority
(NEPRA)**

Determination

In the matter of Upfront Generation Tariff for Solar PV Power Plants

December 15, 2015

Interveners

1. Siachen Energy Limited
2. SINEW Associates (Pvt.) Limited
3. National Water and Power Company (Pvt.) Limited
4. Zonergy Company Limited
5. Asia Petroleum Limited
6. Dawood Lawrencepur Limited
7. 8.2 Ingenieurpartnerschaft Obst & Ziehmann (Pakistan)
8. Harappa Solar (Pvt.) Limited
9. Hydrochina Dawood Power (Pvt.) Limited
10. Siddiqsons Energy Limited
11. StormHarbour Partners LP

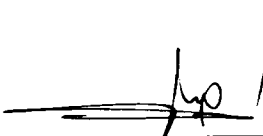
Commentators


1. Punjab Power Development Board
2. Zhenfa energy group Co. Ltd
3. Qureshi Law Associates
4. Alternative Energy Development Board
5. Master Solar Energy Limited
6. Infinity technologies (Pvt.) Limited
7. MI Solar (Pvt.) Limited
8. Nizam Energy (Pvt.) Limited
9. True Power (Pvt.) Limited
10. Gul Ahmed Energy Limited
11. Planning Commission of Pakistan
12. Fotowatio Renewable ventures, B.V
13. Eversheds LLP
14. Scatec Solar
15. ENGIE (UCH Power (Pvt.) Limited)
16. Government of Sindh
17. Central Power Purchasing agency (Guarantee) Limited

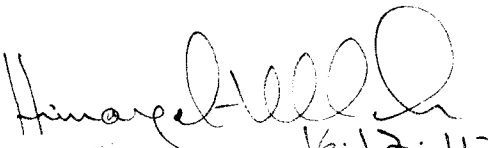


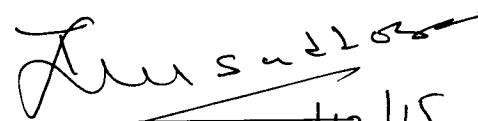
This determination is being given in accordance with Section 31 Sub Section (4) of the Regulation of Generation, Transmission and Distribution of Electric Power Act, 1997 read with Rule 3 of NEPRA Tariff (Standards and Procedure) Rules, 1998 and Regulation 3 of the Upfront Tariff (Approval & Procedure) Regulations, 2011. An applicant can opt for the Upfront Generation Tariff for Solar PV Power Plant once notified in the Official gazette pursuant to section 31(4) of the Regulation of Generation, Transmission and Distribution of Electric Power Act, 1997 (XL of 1997).

Authority

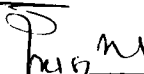

15.12.15
(Khawaja Muhammad Naeem)
Member


16/12/15
(Masood-ul-Hassan Naqvi)
Member


16.12.15
(Himayat Ullah Khan)
Member


16/12/15
(Brig (R) Tariq Saddozai)
Chairman




16.12.15



1. **BACKGROUND:**

- 1.1 NEPRA vide its decision dated 21st January 2014 determined the first upfront tariff for solar PV power plants in the country for a total capacity induction of 50MW with project size of 1MW to 10MW. The Authority determined levelized tariff of US Cents 16.30/kWh for South and US Cents 17.00/kWh for North with a validity period of six months. A total of 47.56MW were opted by IPPs and approved accordingly. The said tariff expired on 20th July 2014.
- 1.2 After the expiry of the 1st upfront solar PV tariff, proceedings were initiated for development of 2nd upfront tariff for solar PV power Plants. The Authority vide its decision dated 22nd January 2015 determined the second upfront tariff for solar PV power plants without limiting to any capacity induction for project size of 1MW to 100MW. The Authority determined levelized tariff within the range of US Cents 14.15/kWh to US Cents 15.02/kWh for three sizes of the project 1MW to 20MW, >20MW≤50MW and >50MW≤100MW for South and North. The validity period for opting the upfront tariff was six months from the date of Notification i.e. 5th March 2015.
- 1.3 Subsequent to the review motions filed by different stakeholders against the above decision, the Authority modified its order mainly to the extent of sharing mechanism with no change in the tariff. The validity was enhanced to six months from the date of notification of the revised order. The revised order was notified on 1st July 2015. The tariff will expire on 31st December 2015. A total capacity of 431 MW was approved under the 2nd upfront tariff till 15th December 2015, out of which 100MW is in operation.

2. **REQUEST TO RATIONALIZE THE UPFRONT SOLAR TARIFF**

- 2.1 MW&P vide its letter No. Tariff/Solar-2015 dated 7th July 2015 requested to rationalize the solar tariff in line with the rationalization of the recent wind upfront tariff on account of improvement in technology and reduction in equipment cost. It will be appropriate to point out that no such observations were forwarded by MW&P during the proceedings which were concluded in May 2015. MW&P was also requested vide letter No. NEPRA/R/SAT-I/TRF-100/UTS/11694 dated 6th August 2015 to provide evidence in support of its request, however, no such evidence was provided.
- 2.2 Alternative Energy Development Board vide its letter No. B/3/2/SPV/Tariff/13 dated 15th July 2015 made similar request to reduce upfront solar tariff on account of decreasing global solar PV costs and impact of lower interest rates. Alternative Energy Development Board provided the latest publication of International Renewable Energy Agency (IRENA) on costs of renewable energy projects in support. Alternative Energy





Development Board also requested to reduce the threshold for the degradation to encourage the employment of only the latest and most efficient PV modules in the market. It will be appropriate to mention that no such request was made by Alternative Energy Development Board during the proceedings of the upfront solar tariff which were concluded in May 2015. Alternative Energy Development Board was also directed vide letter No. NEPRA/R/SAT-I/TRF-100/UTS/11699 dated 6th August 2015 to provide specific evidence (IRENA publication provides information in general terms only) in support of its request, however, no such evidence was provided.

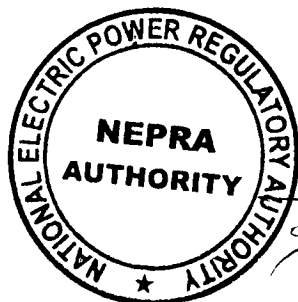
2.3 Ministry of Planning, Development & Reform (MPD&R) vide its letter No. 44(14)Energy/PC/2015 dated 30th July 2015 submitted that the world is witnessing the declining trend in solar PV tariff and in some places it has come down to as low as 5 cents. According to the Ministry, falling CAPEX and O&M costs are largely responsible for this development and there is a strong case for solar PV tariff in Pakistan to be around USc 10/kWh on foreign financing. The present tariff of USc 14/kWh (17-18 cents in first 10 years) for a 1000 MW project may cause a large impact on average cost of generation, public unrest, higher circular debt and subsidies. The Ministry attributed following two factors which contributed to higher PV tariff:

- i. Higher allowed CAPEX of US\$ 1.4/W as compared to US\$ 1/W in the international market.
- ii. Unusually high O&M cost of USc 2.35/kWh which is double than the other regions. Similarly insurance premium of 1% of the EPC cost is four times higher than the international rates.

2.4 According to the Ministry, the argument that higher tariff would attract investment has not been proved to be true and there has to be a fair and competitive tariff acceptable to both buyers and sellers. The Ministry also submitted a paper titled 'Should the Solar PV Tariff be Adjusted Downwards' prepared by Energy Wing, Planning Commission, MPD&R. According to the Ministry in the referred paper attempt has been made to evaluate solar PV tariff in Pakistan with other countries and to find out the reason for such differences followed by recommendations to revise the solar PV tariff downward and to keep it current with evolving market realities which indicate rapid reduction in solar PV costs and tariff worldwide.

3. INITIATION OF SUO MOTU PROCEEDINGS

3.1 Keeping in view the submissions made by the above stakeholders and the fact that the validity period of existing tariff will expire on 31st December 2015, the Authority decided to initiate suo motu proceedings for the development of new upfront solar tariff. Accordingly a proposal for the new tariff was developed. The salient features of the proposal was made public on 19th September 2015 inviting stakeholders to become a party to the proceedings through filing of intervention requests or submit comments to





assist the Authority in making an informed decision. Individual letters were sent to all concerned.

4. SALIENT FEATURES OF THE PROPOSAL

4.1 Salient features of the proposal are provided hereunder:

i. **Project Cost.** The following project cost was proposed:

Items	US\$ Million/MW
Module Cost (including US\$ 0.02 million/MW for degradation)	0.570
Inverter Cost	0.090
Mounting Structure	0.100
Cable & Transformer	0.100
Civil & General Work	0.100
Land Cost	0.014
Project Development Cost	0.037
Insurance during construction	0.010
CAPEX	1.021
Financing Fees & Charges 3%	0.027
IDC	0.019
Total Project Cost	1.067

ii. **Tariff:** The proposed tariff was as under:

Description	Local Financing	Foreign Financing
	Usc/kWh	Usc/kWh
Average 1-10 Years	13.01	11.22
Average 11-25 Years	5.19	5.13
Average for 25 Years	8.32	7.57
Levelized for 25 Years	10.48	9.25

iii. **Assumptions:** The above tariff was calculated on the basis of following assumptions:

- Annual O&M cost of US\$ 26,541/MW and annual insurance during operation of US\$ 9,600/MW.
- Capacity Utilization Factor of 19% on installed capacity.
- 0.5% Degradation for each year after year 1 has been incorporated in the panel cost.
- Financing Fees & Charges of 3.5%.
- Exchange Rate of Rs. 105/US\$
- Debt Equity Ratio of 75:25
- ROE of 17% on IRR basis.





- Interest Rate of KIBOR 7.02% + 3% premium for local financing and LIBOR 0.31% + 4.5% premium for foreign financing.
- Debt repayment period of 10 years.
- Construction period of 1 year.

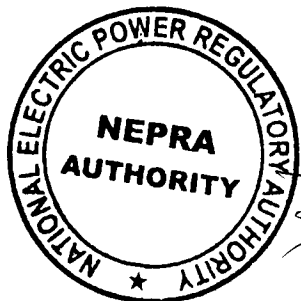
5. FILING OF INTERVENTION REQUESTS/COMMENTS

5.1 The following stakeholders filed intervention requests in the matter:

Sr. #	Interveners
1	Siachen Energy Limited
2	SINEW Associates (Pvt.) Limited
3	National Water and Power Company (Pvt.) Limited
4	Zonergy Company Limited
5	Asia Petroleum Limited
6	Dawood Lawrencepur Limited
7	8.2 Ingenieurpartnerschaft Obst & Ziehmann (Pakistan)
8	Harappa Solar (Pvt.) Limited
9	Hydrochina Dawood Power (Pvt.) Limited.
10	Siddiqsons Energy Limited
11	StormHarbour Partners LP

5.2 The following stakeholders filed the comments in the matter:

Sr. #	Commentators
1	Punjab Power Development Board
2	Zhenfa energy group Co. Ltd
3	Qureshi Law Associates
4	Alternative Energy Development Board
5	Master Solar Energy Limited
6	Infinity technologies (Pvt.) Limited
7	MI Solar (Pvt.) Limited
8	Nizam Energy (Pvt.) Limited.
9	True Power (Pvt.) Limited
10	Gul Ahmed Energy Limited
11	Planning Commission of Pakistan
12	Fotowatio Renewable ventures, B.V
13	Eversheds LLP
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6. HEARING

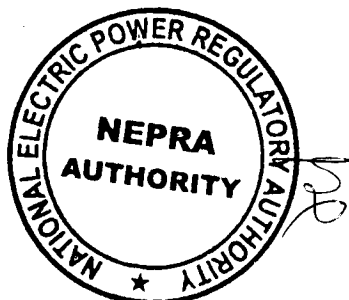
- 6.1 The hearing in the matter was scheduled on 15th October 2015 at NEPRA Tower, Islamabad. Notice of hearing was published on 19th September 2015 in leading news paper both in Urdu and English. Individual letters were also sent to all concerned.
- 6.2 The hearing was held as per schedule and was overwhelmingly participated by the key stakeholders i.e. Alternative Energy Development Board, Planning Commission, Punjab Power Development Board, Energy Department Government of Sindh, Central Power Purchasing Agency (Guarantee) Limited and other stakeholders.

CONSIDERATION OF THE VIEWS OF THE STAKEHOLDERS, ANALYSIS, FINDINGS AND RECOMMENDATIONS ON IMPORTANT ISSUES

7. PROJECT COST

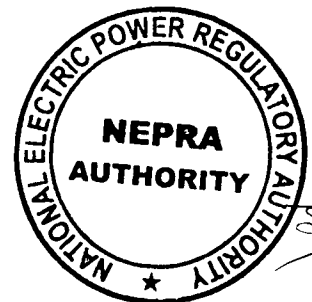
- 7.1 The submissions made by the interveners and commentators on account of project cost and tariff have been summarized hereunder:

Alternative Energy Development Board	<ul style="list-style-type: none"> - The designed single tariff for whole of Pakistan is apparently a better and more practical approach, though its implications in terms of solar irradiation and corresponding capacity factors need to be examined further. - The 35% drastic drop in tariff might not go in favour of solar industry in Pakistan and can distract the investors and interests gained by the international lenders and developers. - The abrupt reduction of tariff in Pakistan may cause negative impacts upon overall solar industry. - Comparing global feed-in tariffs (Japan: USc 40/kWh, Thailand: USc 23/kWh, Indonesia: USc 28/kWh, China: USc 14.3/kWh), the proposed new Upfront Tariff could be less attractive for investors and developers. - Solar PV tariff in certain countries witnessed considerable drop by gradually achieving maturity combining with other liberal incentives e.g. free-of-cost land, concessional loans, equity sharing, risk free investment, better overall security situation, adequate safeguard towards policy change etc. With only 100 MW solar PV project commercially operating (public sector entity), the environment in Pakistan is least conducive with no local industry support, less favorable investment environment, number of associated risks including country risk, power evacuation and grid and electricity payment issues and additional development costs.
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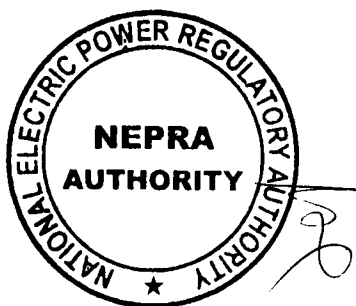


	<ul style="list-style-type: none">-The estimates for capital and operational costs need to be looked into in detail to fit in local conditions. It seems that NEPRA has considered the cost of solar PV projects on the basis of regional reference, which has no direct reference with the RE Policy being following in Pakistan. While finalizing, NEPRA needs to account for all the tariff mechanism, federal and state-to-state incentives, financial parameters, success rate of existing tariff rates and other economic parameters.
- Punjab Power Development Board	<ul style="list-style-type: none">-Module's price of different manufacturers around the globe stays around the Module's Cost (USD 0.55 M/MW) as has been assumed by the Authority. It is worth mentioning that said Module's Cost is a 'Spot Market Price'. We understand that said Module's Cost based on 'Spot Market Price' may not be economically feasible or even available for development of a utility-scale and ground-mounted Independent Power Project.-Requested to consider this pivotal aspect in order to arrive at a prudent Capital Cost feasible for development of the IPP at this preliminary and nascent stage of solar PV market in our country.
Government of Sindh	<ul style="list-style-type: none">-The sinosure fee is missing in the proposed project cost.-The importance of insurance cover is a must for arranging the foreign debt due to financing limit by Central Bank. The financing Limit of State Bank of Pakistan allows maximum limit of 3 billion rupees. Thus no any 50 MW project can be financed under the existing financial regime.-The proposed upfront tariff indicates a reduction of around 30% in per unit cost of energy to existing upfront tariff the reasons of which needs to be elaborated to justify the proposed tariff. Such a change within four months without proper justifications will not only shatter the confidence of foreign direct investments, but also create a negative impact on the smooth implementation of the GOP Policy for Power Generation through Renewable Energy 2006 to arrange huge investments for the sector development.-The neighboring country India has more than 4000 MW solar power installed capacity and most of the cost components are locally financed. We have only a few grid connected projects of nominal capacity and require extra efforts to maximize the RE share. In order to create a level playing field for international investors, it is proposed that the project costs comparison exercise with neighboring countries tariff models may also be carried out to justify the project costs.



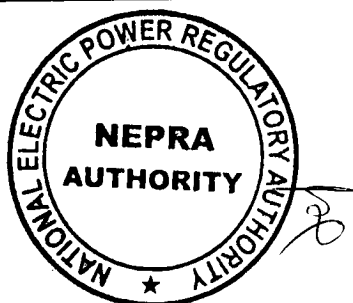


MI Solar (Pvt.) Limited	<ul style="list-style-type: none">- The FIT in various countries are higher than the proposed tariff. At the initial stage India offered investors an outsized return on investment which resulted in tariff close to 20 USD cents which at that time was higher than most FIT regimes.- Based on quotations of EPC contractors, the EPC cost likely to range between \$ 1.3 million to \$1.4 million per MW.- The Authority may consider revising the allowable EPC cost to a reasonable level such that projects can procure the best in class technology that will give the lenders as well as the equity investors a greater level of comfort and the projects will be bankable.- The Authority may consider Single Axis Tracking System as an option which will increase the capacity factor from 25% to 30% depending on location with additional cost of \$ 0.15/W to \$ 0.2/W and with slight increase in O&M.- For 50MW Authority is envisioning a Project Development Cost (PDC) of \$1.85 million, it is requested to increase the PDC cost to \$3 million.- Requested to allow \$25,000/MW for land and its development cost in line with the prevailing upfront tariff.- In areas where there is grid availability and high irradiance the demand for land is quite high and cost of the land is moving closer to \$5000 per acre due to the scarcity of desirable land. Requested to increase the proposed land cost in line with the market rates.- Increase the rate of foreign debt financing in line with the recently issued Eurobonds.
Zonergy Company Limited	<ul style="list-style-type: none">- Average module price is \$0.7/w as on July 20, 2015 which do not include customs, insurance and shipping.- Mounting Structure cost is \$ 0.15/w, cabling and interconnection cost is \$ 0.13-0.15/w.- The cost of civil works is also on lower side and even lower than in china.- Non EPC cost should be at par with the previous upfront tariff i.e. \$0.0435/w.- Requested to include a separate head of personnel security cost.- EPC Margin, Project Management Costs or EPC pricing guarantee costs which are an integral part of Project deployment and typically are in the range of 15-25% depending on specifics of the Project are missing in the proposed upfront tariff.



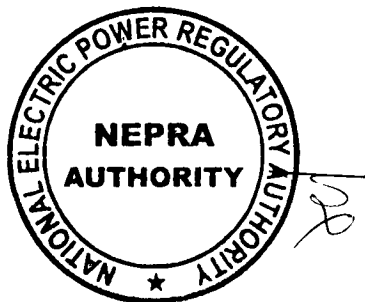


	<ul style="list-style-type: none">- Balance of Plant equipment such as combiner & junction boxes, surge arrestors, communication equipment, SCADA etc. have been ignored in the proposal and requested to include these costs as part of EPC cost.- Such a large change in the Upfront Tariff will create an environment of instability, dampening investor confidence and discouraging future investments in the sector. Moreover, Project Lenders will also become wary with drastic changes in tariff in a short period of time.- Pakistan recently placed a 10 year Eurobond at a coupon of 8.25% which is a 600 basis point premium over the US 10 year bond and 750 basis points over the German 10 year bond. It is important to consider that the pricing of this bond only considers the sovereign risk.- The pricing of debt assumed by the Authority is priced at a premium of 450 basis points over 3 month LIBOR even though this is sub sovereign debt with additional risk such as project construction, commercial, security etc. risks added.- Taxes should be made pass through.- Distinction be maintained between the scale of the projects.
<p>- 8.2 Ingenieurpartnerschaft Obst & Ziehmann (Pakistan) (SMC-PVT) Limited</p>	<ul style="list-style-type: none">- The proposed project cost is only achievable for greater than 100MW projects in mature markets.- The solar market in Pakistan is not mature. Delays in regulatory approvals and consents severely restrict the pace of the project.- Requested to include the EPC contractor's margin in the project cost.- Requested to increase the civil and general works cost due to increase in the prices of cement, steel and labour.- The proposed tariff does not include the third party quality assurance cost which is around \$0.02-\$0.04/W.- Due to the economies of scale, actual project cost varies with size which needs to be accounted in the tariff.- Proposed following project costs for different sizes of projects:<ul style="list-style-type: none">USm1.236/MW for >50 MWUSm1.343/MW for 10-50 MWUSm 1.45/MW for 1-10 MW
<p>- Nizam Energy (Pvt.) Limited</p>	<p>- Project implemented under project finance mechanism is based on a turnkey, fixed price EPC that includes assurances and guarantees as to the quality and timely completion of the project along-with plant availability and production/performance guarantees. These</p>



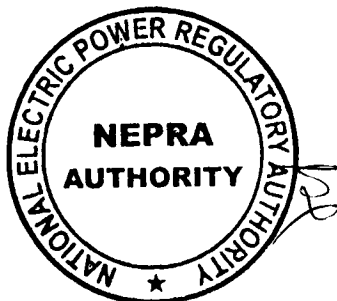


	<p>assurances and guarantees entails additional costs that are not accounted for in the proposal.</p> <ul style="list-style-type: none">-The EPC quotes provided by the renowned EPC contractors are significantly higher than the proposed cost.-Proposed project cost does not cater for different sizes of projects.-Equipment cost and O&M components for tracking systems and related mechanical equipment has been completely ignored.-Given the status of the grid in Punjab most developers are opting for land in Punjab, which has resulted in the property rates skyrocketing to about US\$ 6,000 /acre in areas where the grid is available and where the land is located within the prescribed (according to the grid code) distance from the grid stations.-Proposed Project Development costs are underestimated.-Treatment of duties & taxes has not been provided.-Premium over LIBOR is around 5% as against the proposed 4.5%.-Financing Fees & Charges has been reduced tremendously in absolute terms making it very difficult for the developers to arrange lending for the solar power projects.-Sinosure fee has not been mentioned in the proposal.-Requested Authority to consider the aspects of project finance in relation to the project cost as a proper EPC structure and inclusion of reasonable cost in the upfront tariff will raise confidence of investors and lenders to play their part in the development of solar power projects in Pakistan.
StormHarbour Partner LP	<ul style="list-style-type: none">-The project cost assumption is lowest in the world and excludes substation expenses.-In Pakistan's peer group, the solar tariff ranges from US\$ 0.1147/kWh to US\$ 0.25/kWh.-EPC contractor's margin of 10%-15% is missing.-India is a mature market with 4GW installed capacity.-India is cheaper than China.-The proposed tariff ignores lenders requirements of cost overrun (approximately 10% of EPC cost) and debt service coverage reserve.
-Siachen Energy Limited -Sinew Associates (Pvt.) Limited	<ul style="list-style-type: none">-Indian capital costs were not considered in prevailing upfront tariffs.-Need for turnkey EPC contract completely ignored.-In Pakistan local supply/manufacturing is insignificant as against India where 45%-50% of the EPC cost is based on local.





	<ul style="list-style-type: none">-The Authority is requested to disregard its proposed EPC cost and base the EPC cost on the already determined EPC cost for 2015.-Authority is requested to index already allowed non-EPC costs and PDC with CPI from Aug 2014.-The phasing of the draw downs need to be adjusted as most of the outflows are made upfront immediately after the financial close.-Requested to maintain the spread of 3.5% on local loan.-Requested to maintain existing sinosure fee/export credit agency fee.-Requested redemption equity while calculating IRR.
<ul style="list-style-type: none">- Infinity Technology (Pvt.) Limited.	<ul style="list-style-type: none">- The proposed EPC cost is not realistic and should be at least 40% to 50% higher than the proposed cost.-Non EPC cost is one of the major factor in a PV plant and should be made an integral part of the upfront tariff.-Proposed a lump sum EPC instead of component cost.
<ul style="list-style-type: none">- True Power (Pvt.) Limited.	<ul style="list-style-type: none">-Submitted tariffs in various regions of China for comparison which are as under:<ul style="list-style-type: none">\$0.18-0.21/kWh in 1-5 years and \$0.14/kWh in 6-20 years\$0.17-0.26/kWh in 1-3 years and \$0.14/kWh in 4-20 years\$0.15-0.20/kWh single tariff in 1-20 years
<ul style="list-style-type: none">- Zhenfa Energy Group Company Limited- Qureshi Law Associates	<ul style="list-style-type: none">-The reduction in module prices has been offset by rising prices of basic construction material like steel, cement, sand as well as machinery etc whose costs have not been adequately factored into account in matters like civil and general work.-Additional cost of US\$ 0.4/MW is being estimated for the security of large deployment of key Chinese personnel.-Additional shipping costs US\$ 0.03 /MW and Security/Communication Link would require US\$ 0.015 /MW- The downside risk needs to match with the upside reward.- High quality western origin solar equipment's with high performance and low degradation are available.- Under the present tariff regime, financing sources from US, EU, ECA and other international lenders, who only extend credit to projects where equipment and services are being sourced from their country of origin, will become increasingly limited.- IRR net of tax should be 17%.- Financing rate should be 6% in addition to Sinosure Insurance in appropriate cases.





Master Solar Energy Limited	<ul style="list-style-type: none">- EPC contractor's margin is missing in the proposed tariff.- Design cost of a solar IPP is missing in the proposed cost.- The land cost assumed by the Authority is far below the minimum benchmarks.- Requested to maintain project cost of current tariff.
- Dawood Lawrencepur Limited	<ul style="list-style-type: none">- The proposed project cost is substantially lower than the cost of US\$ 1.52 million/MW approved for QA Solar project which is not consistent with the Upfront Tariff Regulations 2011.- The draft upfront tariff has significantly reduced the IRR rendering the project commercially unfeasible for the sponsors.- Reduction in the tariff has made the project commercially unfeasible.
- Asia Petroleum Limited	<ul style="list-style-type: none">- Cost of smaller projects will be higher and proposing same EPC cost for all sizes seems to be unrealistic as the cost of smaller projects will be much higher due to economies of scale available for the larger projects.- Recommended to include contractor's administration cost in the proposed EPC Cost.- The prevalent EPC price is 35% to 40% higher than the proposed cost.- The cost of non agricultural barren land ranges from Rs. 0.35-0.5 million/acre which is substantially higher than the proposed land cost.- Requested USD 75000 to 80000 on account of PDC for 30 MW Project.- Requested to maintain the level of financing fees and charges of 3.5%.- Recommended to maintain the spread of 3.5% over KIBOR in line with existing upfront tariff.
- Harappa Solar (Pvt.) Limited	<ul style="list-style-type: none">- The proposed project cost does not account for the role of the EPC Contractor and assumes that the plant and equipment shall be sourced directly from different vendors. In the current stage of the solar industry in Pakistan, it will be very difficult to finance projects without the involvement of a bankable EPC contractor as a turnkey solution provider. The EPC Contractor takes end-to-end responsibility for project engineering, procurement and construction and provides significant cash guarantees to developers and lenders for timely completion and guaranteed performance of the plant. Margins for this role are substantial and over and above the cost of individual components.- If spread over KIBOR is reduced to 3% in the new tariff, there should be no sharing of the benefit.





	<ul style="list-style-type: none">-The proposed cost also does not seem to account for switchyard equipment, junction boxes and connectors, SCADA and elementary system and marine and inland transport and custom clearance.-The land cost is very tight for even barren tracts of land with grid proximity as such areas are also typically located on the outskirts of cities or towns.-The reduced insurance component once determined should not be subject to annual true ups on actual basis.-Differentiation between smaller and larger project be maintained as smaller projects can interconnect directly with the 11kV bus bars of grid stations and provide relief to 132/11kV transformers in these grid station.-Recommended two bands of capacity for tariff 1-20 MW and 20MW & above.-Any subsequent increase in the withholding tax rate shall be pass through to the power purchaser.
-Hydrochina Dawood Power (Pvt.) Limited	<ul style="list-style-type: none">-The proposed project cost is not even closer to our recent calculations based on the market price.-The proposed upfront tariff will discourage prospective investors & lenders.-Requested to keep the existing tariff at least for one more year or until the points raised in the intervention have been satisfactorily clarified.
-Siddiquesons Energy Limited	<ul style="list-style-type: none">-The proposed project cost is not reasonable and practicable.-The expected project cost is around \$1.53 million/MW as against the proposed project cost of \$ 1.06 million/MW.
-National Water & Power Company (Pvt.) Limited	<ul style="list-style-type: none">-Due to Chinese decision to increase internal solar energy production, the panel price is to go up albeit not to drastically.-Second grade Chinese inverters, let alone first grade, are well above the quoted price of \$ 0.09/W.-The erratic policy shift also introduces great difficulty in securing project financing.-IRR's within the range of 15-20% do not attract substantial offshore interest under the current tariff volatility.-If the proposed tariff is allowed to go through, it will place unrealistic and unachievable performance targets on the prospects of solar PV energy production in Pakistan, rendering both current and future projects infeasible.-Requested to review the proposed tariff and adjust it based on realistic project cost figures.



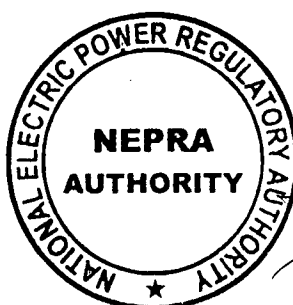


	<ul style="list-style-type: none">- Requested to ensure the continuity of the existing tariff.
<ul style="list-style-type: none">- Scatec Solar ASA	<ul style="list-style-type: none">- The proposed tariff with its assumptions likely will fail to attract international companies to development and invest in PV projects in Pakistan.- Compensation of development costs and risks in a country like Pakistan is not sufficiently considered in the tariff calculation.- DSCR requirements from banks cannot be met with the proposed tenor and financing costs included in total project costs are underestimated.- EPC assumptions appear to be on the low side of what the "bankable" international EPC companies offer and can be expected to offer in 2016 for fixed price fully guaranteed contracts required by international financing institutions.- Other taxes and fees seen in PPA-based projects appear not to have been included.
<ul style="list-style-type: none">- Engie Energy International (UCH Power (Private) Limited)	<ul style="list-style-type: none">- At the outset, it appears that the Tariff is not conducive in attracting potential investors in general and foreign investors in particular.- The proposed project cost is significantly lower than the current prevailing cost.
<ul style="list-style-type: none">- Eversheds LLP	<ul style="list-style-type: none">- The proposed feed in tariff is unlikely to attract international developers interest.- The FIT is not based on P90 forecast (around 17% CUF) which is the requirement of many international lenders.- 4.5% premium on foreign financing is low and international banks may require a higher premium.- The EPC cost is lower than we typically see in the market.- Pakistan does not have significant renewable energy operating capacity and accordingly will not be able to provide new foreign investors with the comfort that a large operating portfolio of renewable energy assets would ordinarily give.- Non viable 2016 FIT could have a negative impact on international appetite for the current 2015 FIT projects. This is because many international developers will require a reasonable development opportunity beyond the current pipeline of projects in order to make the investment decision for Pakistan.- International investors and developers bring with them a wealth of global experience, efficiencies, know-how and value all of which would contribute to making the Pakistan market a success. This would be lost if they are not involved in the next round of projects





	and this could result in local investors deciding not to proceed to financial close because the opportunity for them to recycle their capital may be sufficiently diminished.
- Fotowatio Renewable Ventures, B.V	<ul style="list-style-type: none">- The proposed EPC Cost is low compared to EPC price for similar solar projects available in the market.- The estimated cost of land of \$0.014M/MW is significantly below our assumptions. Our estimate is \$0.038 - 0.045M/MW.- Development cost budget estimated is \$0.037M/MW or 3.5% of the project cost. The company estimated development cost approximately 5% of the project cost.- No provision has been included for the Debt Service Reserve Account (DSRA) in the project cost. Funding the DSRA through the project cost, expected to be permitted by lenders, helps optimize the project returns and thereby reducing tariff. The DSRA component normally is in the range of 5% of the project cost.- We note that the project cost estimates do not include the cost of building a substation and evacuation infrastructure at the site. In case, a new substation is required and the Project Company is responsible for the development, the tariff components need to be suitably adjusted for such increase in capital expenditure.- Based on our experience of financing projects with leading multilateral agencies, we expect premium higher than the indicated 4.5% for foreign financing.
- Gul Ahmed Energy Limited	<ul style="list-style-type: none">- The project cost is inadequate for the construction of solar power project where the Lenders and Sponsors would be provided adequate performance coverage by the EPC contractor and requested to reconsider the cost in the light of previously approved project cost of US\$ 1.538 million/MW.- Sinosure fee is missing in the proposal.- Premium on KIBOR should be 3.5%.- Financing Fees & Charges should be 3.5%- It is not clear whether the mounting structure is fixed, moving or tracking and requested to take the different costs and related efficiencies into account in the determination.- Inspection of plant and machinery should be done away with or the cost is to be born by the off taker.- Financial close time period should be 18 months.



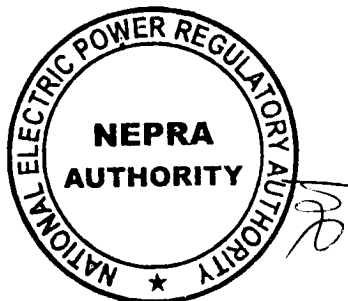


- 7.2 All the stakeholders including Alternative Energy Development Board, Punjab Power Development Board, Government of Sindh, project sponsors and consultants with the exception of Planning Commission Central Power Purchasing Agency (Guarantee) Limited registered their reservation on the project cost specially the EPC cost. Most of the stakeholders submitted that solar power project could not be executed without the involvement of bankable EPC contractor. The EPC Contractor takes end-to-end responsibility for project engineering, procurement and construction and provides significant cash guarantees to developers and lenders for timely completion and guaranteed performance of the plant. Margins for this role are substantial and over and above the cost of individual components. The stakeholders requested to include EPC contractor's margin in the EPC cost. According to StormHabour Partner LLP, the EPC contractor's margin is 10%-15% while Zenergy Company Limited claims it in the range of 15%-25%. Some of the stakeholders also objected the cost assumed on account of different components of the solar PV power plant and suggested to increase the cost for each component. Some of the stakeholders have also submitted that the proposed cost also does not seem to account for switchyard equipment, junction boxes and connectors, SCADA and elementary system and marine and inland transport and custom clearance. Planning Commission submitted that the equipment cost for solar power plant has come down rapidly and currently is around US\$ 1 million/MW. Planning Commission in support submitted the cost assumed by Central Electricity Regulatory Commission (CERC) of India which is around US\$ 0.98 million/MW. The 'IRENA Renewable Power Generation Costs in 2014' provide minimum weighted average project cost in most of the regions around US\$ 1.3 million/MW. The proposed EPC cost for upfront solar PV tariff excluding degradation was US\$ 0.94 million/MW.
- 7.3 The concerns/comments raised by Alternative Energy Development Board, Punjab Power Development Board, Government of Sindh and other stakeholders have been evaluated carefully. Some of the interveners/commentators pointed out that in the proposed EPC Cost, the margin for EPC Contractor (10 – 25%) was missing and needed to be included in the project cost. The Authority considers that the interveners/commentators concern in their regard is valid. In view thereof, the Authority has decided to incorporate the EPC Contractor's margin. Accordingly, the Authority has assessed EPC of US\$ 1.034 million/MW excluding the impact of degradation. The EPC cost will be inclusive of equipment cost, switchyard equipment, junction boxes and connectors, SCADA and elementary system, civil works including land development, boundary wall and water as well as the EPC contractor's margin. The choice of technology will be of the project sponsor based on his evaluation and assessment.





- 7.4 In the proposed tariff, the US\$ 20,000/MW was included in the Module Price for degradation which is based on 0.5% annual degradation from year 2 to 25. The levelized degradation of 3.62% was applied to module price of US\$ 0.55 million/MW to work out the degradation cost. The concept was to make the project sponsor enable to increase equivalent modules each year to offset the degradation. However it has been realized that in order to increase the number of modules, other equipment e.g. mounting structure, cables, civil works will also be required, therefore, the Authority has decided to apply 3.62% levelized degradation to EPC cost and enhanced the EPC cost to 1.0714 to account for the impact of degradation.
- 7.5 In line with the previous upfront tariff, the Authority has also decided to compensate the smaller projects on account of scale disadvantage with respect to 100 MW projects. Accordingly 2% EPC cost premium for $>20\text{MW} \leq 50\text{MW}$ projects and 4% EPC cost premium for $\geq 1\text{MW} \leq 20\text{MW}$ project has been included and EPC cost for smaller project has been enhanced.
- 7.6 The stakeholders have also raised concerns on the assumed land cost of Rs. 300,000/acre of barren land. According to a stakeholder demand of land is high in areas of grid availability and high solar irradiance and the cost of the land is about \$5000 per acre due to the scarcity of desirable land. Other stakeholders suggested land cost in the range of Rs. 350,000/acre to Rs. 600,000/acre. The Authority has considered the submissions made by the stakeholders regarding the cost of land. In the opinion of the Authority, the concerns raised by the stakeholders carry weight for reviewing the proposed land cost. Although the barren land in the country may be available well below Rs. 300,000/acre but sponsors will have to pay some premium for the land near the grid. Accordingly the Authority has decided to assess land cost @ Rs. 500,000/acre and 5 acres of land per MW.
- 7.7 Regarding the project development cost, the Authority has decided to maintain its earlier determined benchmark in the previous upfront tariff. Insurance during construction has been worked out on the basis of 1% of the EPC cost for respective construction period of three types of the projects. Financing fees and charges have been worked out on the basis of 3.5% of the 75% CAPEX in line with the previous upfront tariff. Interest during construction has also been worked out on the basis of construction period of 12 months, 10 months and 8 months for three types of small, medium and large capacity projects. LIBOR 0.31% with a premium of 4.5% has been used for calculation of interest during construction.
- 7.8 Based upon the decisions taken in the preceding paragraphs, the summary of the assessed project cost is provided hereunder:



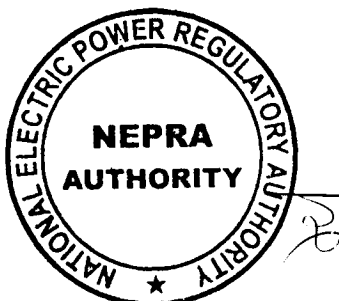


Description	>50 MW≤100MW	>20MW≤50MW	≥1MW≤20MW
	USD/MW	USD/MW	USD/MW
EPC Cost	1,071,431	1,092,859	1,114,288
Other Costs:			
Land Cost	23,810	23,810	23,810
Project Development Cost	36,658	38,490	40,320
Insurance during construction	10,714	9,107	7,429
CAPEX	1,142,613	1,164,266	1,185,846
Finance Cost:			
Financing Fees & Charges	29,994	30,562	31,128
Interest During Construction	21,334	16,043	10,565
Sub total	51,327	46,605	41,693
Total Project Cost	1,193,940	1,210,871	1,227,540

8. CAPACITY UTILIZATION FACTOR (CUF)

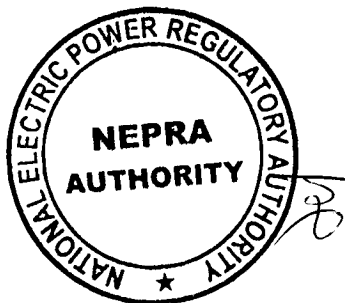
8.1 The submissions made by the interveners and commentators on account of capacity utilization factor have been summarized hereunder:

<p>- Punjab Power Development Board</p>	<p>- Bankable solar irradiation data for Pakistan is not available yet.</p> <p>- As per global practice, while determining the capacity factor, location specific annual global irradiance, direct normal irradiance, climate conditions and other site specific parameters are considered.</p> <p>- A higher capacity factor without bankable supporting data would not only discourage investors but will also make financing of the projects more challenging.</p> <p>- International lenders do not finance the projects on the Power Production work out at P-50.</p> <p>- It is suggested that a revision in the capacity factor, if required, should be made after recording of at least twelve months solar irradiation data for Pakistan, as this would provide a realistic picture including year round and seasonal variations.</p>
<p>- Government of Sindh</p>	<p>- Changing the capacity utilization factor without any detailed study or stakeholders consultations within a span of four months should not be considered as this will certainly halt the current development of solar</p>



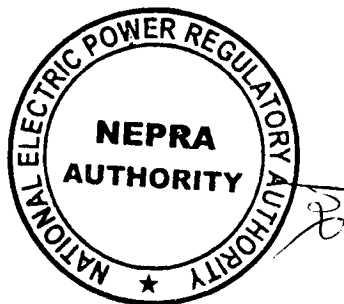


	power generation in Pakistan.
- Central Power Purchasing Agency (Guarantee) Limited	- Supports the increase in the annual CUF and suggests that the upfront tariff should be calculated on the highest achievable capacity factor so the maximum energy can be obtained at low price.
- MI Solar (Pvt.) Limited	- On the basis of study of data of last 7 years, suggested to maintain capacity factor of 17.5% as per current prevailing tariff.
- Zonergy Company Limited	- The proposed CUF of 19% does not have any basis in any bankable data set and will severely affect the bankability of the future projects.
- Nizam Energy (Pvt.) Limited	- Separate CUF factors should be considered for South and North. - The capacity factor has been abruptly increased on the basis of 4 months actual data which is not reasonable and technically not feasible. - None of the contractors are willing to guarantee a power curve based on 19% capacity factor at P90 probability of exceedance levels. - The guaranteed CUF are in the range of 16% to 17.5% at P90. - Lenders requirement is P90 estimate of the energy estimate other wise financing will not be available. - 19% CUF assumes the top of the line and cutting edge technology and can not be achieved with hugely discounted EPC and O&M.
- Siachen Energy Limited - Sinev Associates (Pvt.) Limited	- Base the capacity utilization factor on a credible study and in the absence of study requested to maintain CUF of 16.78% for entire Pakistan on the basis of prevailing upfront tariff.
- Zhenfa Energy Group Co. Limited - Qureshi Law Associates	- Recommended that Present utilization figure be retained if costs are not to increase dramatically.
- Asia Petroleum Limited	- A CUF of 19% is highly optimistic and recommended 17.5% CUF for south region.
- Master Solar Energy Limited	- Lenders require the project to achieve probability exceedance of P90 for financing. A P90 scenario can not achieve proposed CUF of 19% due to various external factors such as solar irradiance, uncertainties, PV technology etc. - Studies conducted in Pakistan in areas with the highest availability of solar resource estimate



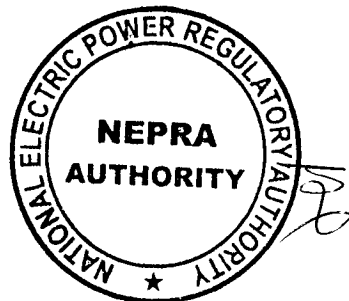


	<p>maximum CUF at around 16% to 17%.</p> <ul style="list-style-type: none">-It is known and proven through international studies that solar resource varies in different regions of the country. The capacity factor must be rational enough to represent every part of the country.-Annual plant capacity factor as in the current tariff be retained.
-Harappa Solar (Pvt) Limited	<ul style="list-style-type: none">-The demarcation of North and South zones with different assumed plant factors should be maintained in the new tariff.-Suggested plant factor 17% for North and 18% for south which is close to P75 yield and is also in line with wind upfront tariff where P75 yield has been used.
-8.2 Ingenieurpartnerschaft Obst & Ziehmann (Pakistan)	-Suggested CUF of 17% for North and 17.75% for South.
-National Water and Power Company (Pvt.) Limited	-Unrealistic target of 19% CUF in Pakistan is overly ambitious and should be brought down to realistic value closer to 17%.
-Infinity Technologies (Pvt.) Limited	-Requested to keep CUF at 17% minimum.
-Dawood Lawrancepur Limited	-Split be maintained for north and south. Annual CUF of 19% is ambitious even for south.
-Hydrochina Dawood Power (Pvt.) Limited	-Chinese have surveyed various sites in Punjab and Sindh but CUF of 19% could not be established.
-Siddiquesons Energy Limited	<ul style="list-style-type: none">-A CUF of 19% has no practical basis and is not achievable in North.-As per the PVSYST V6.38 analysis, the P-50 capacity factor based upon state of the art static poly crystalline modules works out 17.1% in the north zone.-Since financing requires CUF on the basis of P-90, the fair CUF to be used in planning ought to be 16.78%.-Requested to change the CUF from 19% to 16.78%.
-Fotowatio Renewable Ventures, B.V	-The annual Capacity Utilization Factor (CUF) for the PV plant has increased fixed from the former 17.5% to 19% at COD. We would like to understand the rationale of the increase.
-Gul Ahmed Energy Limited	-CUF of 19% is not correct as the lenders require P90 energy estimate.



	-Upside of the efficiency should be passed on to the project.
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- 8.2 The system capacity utilization factor (CUF) is a key driver to the solar project's economics. A PV power plant's capacity factor is a function of the insolation at the project location, the performance of the PV panel (primarily as it relates to high temperature performance), the orientation of the PV panel to the sun, system electrical efficiencies and the availability of the power plant to produce power. Keeping all the other factors constant, a good quality solar PV system will be capable of achieving higher CUF as compared to a low quality solar PV system.
- 8.3 The Authority in its previous upfront solar tariffs used CUF of 17.5% for South Region and 16.78% for North Region and the solar PV tariff was based on these capacity utilization factors. The proposed tariff was based on capacity utilization factor of 19%. One of the stakeholders, Harappa Solar, requested to fix the CUF of 18% for South Region and 17% for North Region. Another Stakeholder, 8.2 INGENIEURPARTNERSCHAFT OBST & ZIEHMANN, requested to fix CUF at 17.75% and 17% for South and North respectively. Other stakeholders generally disagreed with the assumed CUF and requested to retain the existing CUFs for the respective regions. Central Power Purchasing Agency (Guarantee) Limited and Planning Commission supported the increase in the CUF.
- 8.4 Alternative Energy Development Board in its comments suggested that capacity utilization factor should be realistic. According to Alternative Energy Development Board prime inputs for capacity factor are the monthly and annual irradiance numbers and the well-established losses factors including direct losses and uncertainties and the capacity ratings of the panels and inverters. The direct losses help in determining the capacity factor for P50 power production estimates and through uncertainties probability of exceedence at P75 and P90 is worked out. According to Alternative Energy Development Board as per the feasibility studies received from the project developers, on the basis of satellite data, the average P50, P75 and P90 capacity factor for whole of Pakistan is around 17.84%, 17.47% and 16.69% respectively. The data provided by Alternative Energy Development Board showed that change of technology at the same location will give different output e.g. Thin film gives 18% CUF at P90 while polycrystalline gives 17.2% CUF at P90 at Jhampir Sindh. The AEDB data provides P75 figure in South only for Jhampir which is 20.5% for thin film and 18.30% for polycrystalline. The data provided by Alternative Energy Development Board has been further analyzed for south and north regions which shows that the average P90 CUF in South is 17.55% and in North 16.02%.
- 8.5 Satellite solar data is available from different data providers for example meteonorm, NASA etc. and the data available from these data providers vary with each other. The data available with meteonorm is generally considered as conservative. Most of the





feasibilities use meteorological data. The actual data and output may vary with the satellite data as has been observed in the Bahawalpur where actual output exceeded the estimated output on the basis of satellite data in August and September 2015 but was behind the estimate in October and November 2015. The Actual output for QA Solar (Pvt.) Limited power plant at Bahawalpur from April-November is 18.75%.

8.6 On the basis of discussions in the preceding paragraphs and submissions made by different stakeholders, the Authority has decided to fix the capacity utilization factor of 18% for South region and 17% for North region for calculation of the upfront tariff.

9. DEGRADATION

9.1 The submissions made by the interveners and commentators on account of degradation have been summarized hereunder:

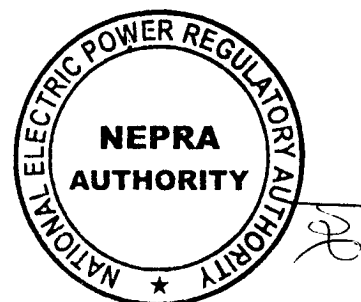
- Alternative Energy Development Board	- Fixing degradation factor to 0.5% is appropriate. - Since the degradation has been included in the capital cost, clarification is required as to how it will be applicable to tariff.
- Central Power Purchasing Agency (Guarantee) Limited	- The degradation limit should be equal to the degradation of best available solar panels in market e.g. less than 0.4% by Sunpower. - As per feasibility submitted by Apollo Solar Development (Pvt) Limited, the consultant stated annual degradation of 0.3%.
- Infinity Technologies (Pvt.) Limited	- Plant degradation should be 0.7% instead of 0.5%. - Degradation varies among the manufacturers and with the Poly Silicon wafers used in the modules. The effects become obvious after a few years.
- Zhenfa Energy Group Co. Limited - Qureshi Law Associates	- The actual power degradation in the first year is 2-2.5%, for the second year it is 1%, from 3rd to 5th year it is 0.7% annually and from the 5th year till the 25th year it is roughly 0.6% annually.
- Zonergy Company Limited	- NREL has determined a mean degradation of 0.8% per annum globally, for crystalline silicon panels. - Requested to revert to 0.7% of degradation. - Exclude the cost of degradation from the module price
- Siachen Energy Limited - Sinew Associates (Pvt.) Limited - Master Solar Energy Limited	- Requested to maintain the degradation terms already allowed in the prevailing upfront tariff.
- Infinity Technologies (Pvt.) Limited	- Recommended Degradation of 0.7% per annum
- Asia Petroleum Limited	- It is unclear from the Proposal as to how the amount of USD 0.02 million per MW was determined for degradation as it is not corresponding with the 0.5% per annum given over the 25 years of the Project life.





	- Recommended Degradation of 0.7% per annum.
- 8.2 Ingenieurpartnerschaft Obst & Ziehmann (Pakistan)	- Annual degradation of 0.5% is possible for good quality components
- Dawood Lawrencepur Limited	- Annual degradation of 0.5% be enhanced to the industry norm of 0.7%, even with good quality components
- Nizam Energy (Pvt.) Limited	- The global industry norm with regards to annual degradation is 0.7% and the same is requested to allow as has been done in the previous tariff.
- Gul Ahmed Energy Limited.	- Degradation should be up to 1.2%. - Degradation in 1 st year varies between 2.5%-3% and requested to incorporate an appropriate adjustment in the tariff.

- 9.2 In the previous upfront solar tariffs annual degradation of 0.7% from year 2 to 25 was allowed. However, as long as the actual generation remains beyond the minimum output at specified capacity utilization factors, the degradation was not applicable. In the proposed upfront tariff for 2016, degradation of 0.5% was assumed and was included in the module price. Alternative Energy Development Board endorsed the 0.5% assumption, however, asked to clarify how it will be applicable to tariff when it is included in the project cost. Other stakeholders, with the exception of one, generally opposed the 0.5% degradation and requested to maintain the earlier benchmark.
- 9.3 Good quality solar modules with 0.5% annual degradation are available in the market. The stakeholders acknowledge the availability of such solar modules; however, they are of the opinion that the cost of such modules is high. The fact is that the extra cost does not only cater for lower degradation but also ensures better power output over the life of the project and the project sponsor will be compensated through excess energy payment for extra output beyond the minimum required output. It is a tradeoff between the quality and cost and the project sponsor has to select the best technology keeping in view the climatic conditions, payback period, bankability of the project etc. Therefore, the Authority has decided to approve 0.5% annual degradation from year 2 to 25.
- 9.4 Another issue is the accounting/treatment of the degradation in tariff. In the previous upfront tariffs, degradation was allowed separately which is inconsistency with the global practice. Accordingly, in the proposed upfront tariff, 0.5% degradation from year 2-25 was levelized which works out 3.62% and was included in the module price to enable the sponsor to increase the number of modules corresponding to the annual degradation. However, it has been realized that to increase the number of modules require other equipment such as mounting structure, cables, inverters etc. therefore, the degradation cost should be calculated on the basis of EPC cost instead of module price only. Accordingly EPC cost has been increased by 3.62% to cater for degradation and no separate payment will be made during the tariff control period on account of degradation.





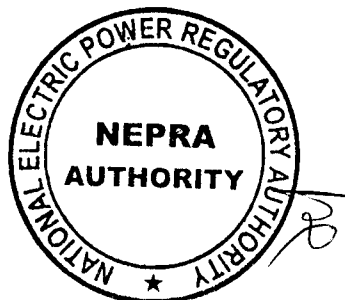
10. O&M COST

10.1 The submissions made by the interveners and commentators on account of O&M cost have been summarized hereunder:

- MI solar (Pvt.) Limited	- Requested to increase O&M Cost as to account for replacements of the modules and inverters over the life of the project.
- Siachen Energy Limited - Sinev Associates (Pvt.) Limited - Infinity Technologies (Pvt.) Limited	- Requested to index the already allowed O&M cost.
- Zhenfa Energy Group Co. Limited - Qureshi Law Associates	- Suggested that the previous cost of O&M of US\$ 31,114 /MW be retained if not increased.
- Asia Petroleum Limited	- The proposed O&M cost is too optimistic and recommended to maintain the earlier determined O&M cost of USD 36,114/MW.
- StormHarbour Partner LP	- No evidence of reduction in O&M cost.
- Dawood Lawrancepur Limited	- The reduction of O&M cost of 35.4% is not justified and is not sustainable for the developers - Current insurance cost of USD 14,113 /MW be retained. - The draft tariff is silent on the adjustment of insurance with actual.
- Gul Ahmed Energy Limited.	- Annual O&M and insurance is much lower than the previously allowed cost.

10.2 The proposed O&M component of tariff is based on estimated annual O&M expenses of US\$ 26,541/MW which is based on O&M budget of US\$ 25,391/MW allowed in the first upfront tariff adjusted by US CPI, Local CPI and Exchange Rate as stipulated. In the 2nd upfront tariff O&M cost of US\$ 36,114/MW was allowed which was based on O&M contract of QA Solar (Pvt.) Limited which was taken as a package along with discounted project cost. According to the Planning Commission, the O&M cost allowed in the existing tariff is unusually high and is double than the other regions. Other stakeholders objected the proposed O&M cost and requested to allow the existing O&M cost.

10.3 CERC India assessed O&M cost of US\$ 20,951/MW for the first year of operation, thereafter, O&M cost is increased by a constant escalation factor of 5.72% for each year. The proposed O&M cost in Pakistan is US\$ 26,541/MW which is also subject to Exchange Rate, US CPI and Local CPI. The higher proposed O&M as compared to the neighboring country is justified considering the nascent stage of solar PV projects development in the country. Accordingly, the Authority has decided to approve the O&M cost of US\$ 26,541/MW for the solar PV projects.





11. INSURANCE COST

11.1 Actual Insurance cost during operation subject to maximum of 1% of the EPC cost was allowed in the previous upfront solar tariff and other technologies and the same is being approved.

12. FINANCING OF THE PROJECT AND COST OF CAPITAL

12.1 The projects will be financed through debt and equity. Debt may be raised in local as well as foreign currency and mix of local/foreign debt financing may also be allowed.

12.2 Debt servicing component has been worked out on the basis of debt equity ratio of 75:25, debt repayment period of 10 years with equal quarterly installments and cost of debt of LIBOR 0.31% +4.5% premium. In case of local financing KIBOR+3% premium will be applicable.

12.3 ROE component has been worked out on the basis of 17% IRR on equity and construction period of 12 months, 10 months and 8 months for three sizes of projects in line with the previous upfront tariff.

12.4 Some of the stakeholders have requested to allow Debt Service Reserve Account (DSRA). The request has not been considered because spread has already been fixed on the higher side. Similarly returns being offered are unprecedented. If this risk has to be covered separately, then the spread and return shall need to be adjusted downward.

13. SUMMARY OF TARIFF

13.1 On the basis of discussion/recommendations in preceding paragraphs, the summary of tariff is provided hereunder:

NORTH REGION

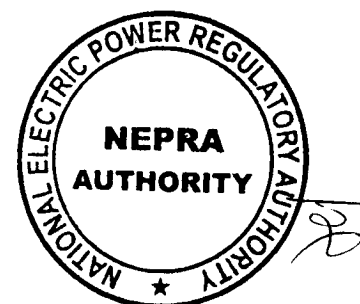
Description	≥1≤20MW	>20≤50MW	>50≤100MW
Tariff:	Cents/kWh	Cents/kWh	Cents/kWh
1-10 Years	14.0604	13.9394	13.8145
11-25 Year	6.2363	6.2215	6.2045
Levelized for 25 Years	11.5327	11.4460	11.3560

SOUTH REGION

Description	≥1≤20MW	>20≤50MW	>50≤100MW
Tariff:	Cents/kWh	Cents/kWh	Cents/kWh
1-10 Years	13.2793	13.1650	13.0471
11-25 Year	5.8898	5.8758	5.8598
Levelized for 25 Years	10.8920	10.8101	10.7251

13.2 The following indexation will apply on the reference components of the determined tariff:

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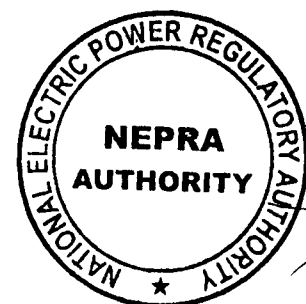
Component	Indexation
O&M-Local	Local CPI (General)
O&M-Foreign	PKR/US\$, US CPI
Insurance	Actual with maximum of 1% of EPC cost
Return on Equity	PKR/US\$
Principal Repayments (Foreign Loan)	PKR/US\$ or the applicable currency
Interest Payments	LIBOR/KIBOR, PKR/US\$

14. EXCESS ENERGY MECHANISM

- 14.1 According to Harappa Solar, there should be no sharing of any excess energy produced by solar projects. Sharing discourages innovation and use of technologies such as tracking which involve higher capital expenditure. Since the downside revenue risk is entirely borne by the project company, any upside should be to the company's account as well so that the motivation is to produce maximum energy with a high quality plant rather than setting up the cheapest plant.
- 14.2 In the previous upfront tariff, excess energy beyond the benchmark capacity factors was required to be shared between the power producer and the power purchaser in the ratio of 75:25 for 1st 1% and 80:20 for the 2nd 1% beyond this 100% benefit was allowed to be retained by the power producer. This means that if the actual output is established 2% higher than the benchmark output, 0.45% out of 2% will be transferred to the power purchaser free of cost, thereby increasing the benchmark capacity factor to 17.95% in case of South Region (17.23% for North).
- 14.3 The Authority has considered the submissions of the stakeholders and the impact of excess energy on the effective capacity utilization factor. Since the Authority has set the benchmark capacity utilization factors well below the proposed 19%, therefore, the Authority has decided to continue the excess energy sharing mechanism. However, the power producers' share has been increased from 75% to 80% for the 1st 1% and 80% to 90% for the next 1% beyond that the 100% benefit will continue to be retained by the power producer. The increased benefit will promote investment in better technologies as the increased capital cost will be compensated by corresponding payment in the shape of for excess energy payment.

15. APPROVAL OF INTERCONNECTION/LEVEL OF INDUCTION

- 15.1 Regarding the approval of interconnection studies, Harappa Solar submitted that DISCOs be allowed to review and approve grid studies for projects interconnecting up to 132 kV subject to any overall limits set by NTDC. Gul Ahmed Energy Limited submitted following in this regard:



- i. The studies may be carried out by the power producer and reviewed/approved by NTDC.
- ii. For projects interconnecting at 11KV the studies may be reviewed by the relevant distribution company, if the power producer desires.
- iii. A time period may be determined during which NTDC would be required to communicate its recommendations to NEPRA.
- iv. Recommendations on suitability should be limited to power evacuation and interconnection and not the commercial/financial aspects of the project.

15.2 In line with its decision in the previous upfront solar tariff, the Authority has decided that as a condition precedent for opting the upfront solar tariff, approval of NTDC/DISCO for power evacuation and interconnection will be mandatory. NEPRA will consider only those projects for approval of upfront tariff, which submit NTDC's/DISCO's explicit approval in this respect. Accordingly the Authority directs the following:

- The studies for power evacuation and interconnections may be carried out by the power producer and reviewed/approved by NTDC/DISCO.
- For projects interconnecting at 11kV the studies may be reviewed by the relevant distribution company.

16. BIFURCATION OF REGIONS

16.1 In accordance with the previous upfront solar tariff, the country has been divided in to two regions South and North. South Region comprises of Sindh Province, Baluchistan Province and Southern Punjab. All other parts of country are included in the North Region. The following districts are included in the Southern Punjab:

- Rahim Yar Khan
- Bahawalpur Cholistan)
- Rajanpur
- Dera Ghazi Khan
- Muzaffargarh
- Multan
- Lodhran
- Vehari
- Bahawalnagar



17. ORDER

- I. The Authority hereby determines and approves the following upfront tariff and adjustments/indexations for solar power generation for delivery of electricity to the power purchaser based on solar PV power plants:

Specified Reference Tariff NORTH REGION

Description	≥1≤20MW	>20≤50MW	>50≤100MW	Indexations
	Rs./kWh	Rs./kWh	Rs./kWh	
O&M	1.8714	1.8714	1.8714	CPI , US CPI, PKR/US\$
Insurance	0.7857	0.7705	0.7554	Actual on annual basis
ROE	3.8911	3.8907	3.8880	PKR/US\$
Debt Servicing (1-10 Years only)	8.2154	8.1038	7.9905	PKR/US\$ & LIBOR/KIBOR
Total Tariff 1-10 Years	14.7634	14.6364	14.5053	
Total Tariff 11-25 Years	6.5481	6.5326	6.5148	

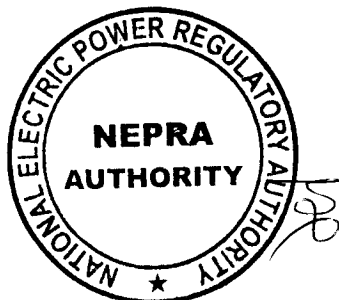
SOUTH REGION

Description	≥1≤20MW	>20≤50MW	>50≤100MW	Indexations
	Rs./kWh	Rs./kWh	Rs./kWh	
O&M	1.7674	1.7674	1.7674	CPI , US CPI, PKR/US\$
Insurance	0.7420	0.7277	0.7135	Actual on annual basis
ROE	3.6749	3.6745	3.6720	PKR/US\$
Debt Servicing (1-10 Years only)	7.7590	7.6536	7.5466	PKR/US\$ & LIBOR/KIBOR
Total Tariff 1-10 Years	13.9432	13.8232	13.6994	
Total Tariff 11-25 Years	6.1843	6.1696	6.1528	

- i. The detailed tariff tables and debt service schedules for each project size are attached as Annexures.
- ii. The debt servicing component shall be paid in 1st 10 years only.

II. ONE TIME ADJUSTMENT AT COD

- i) Since the exact timing of payment to EPC contractor is not known at this point of time, therefore, an adjustment for the relevant foreign currency fluctuation for the 90% of the EPC portion of payment in the foreign currency will be made against the reference exchange rate of Rs. 105/US\$ on the basis of monthly average exchange rates prevailing on 1st day of each month during the construction period. The adjustment shall be made only for the currency fluctuation against the reference parity values.
- ii) Interest during construction will be reestablished on the basis of actual project financing and weighted average quarterly LIBOR/KIBOR and applicable premiums





4.5% and 3% respectively. Saving in premium shall be shared in the ratio of 60:40 between power purchaser and power producer.

- iii) In case Sinosure fee or export credit agency fee on foreign financing is payable, the benchmark established in the coal upfront tariff will be applicable subject to maximum of 7% and appropriate adjustment in the project cost shall be made.

III. ADJUSTMENT IN INSURANCE AS PER ACTUAL

The actual insurance cost for the minimum cover required under contractual obligations with the Power Purchaser not exceeding 1% of the EPC cost will be treated as pass-through. Insurance component of reference tariff shall be adjusted annually as per actual upon production of authentic documentary evidence according to the following formula:

AIC	=	$Ins_{(Ref)} / P_{(Ref)} * P_{(Act)}$
Where		
AIC	=	Adjusted Insurance Component of Tariff
Ins _(Ref)	=	Reference Insurance Component of Tariff
P _(Ref)	=	Reference Premium 1% of the EPC cost at Rs. 105/US\$.
P _(Act)	=	Actual Premium or 1% of the EPC cost in Pak Rupees on exchange rate prevailing on the 1st day of the insurance coverage period whichever is lower

IV. INDEXATIONS:

The following indexations shall be applicable to the reference tariff;

i) INDEXATION OF RETURN ON EQUITY (ROE)

After COD, ROE component of tariff will be quarterly indexed on account of variation in PKR/US\$ parity according to the following formula:

ROE _(Rev)	=	$ROE_{(Ref)} * ER_{(Rev)} / ER_{(Ref)}$
Where;		
ROE _(Rev)	=	Revised ROE Component of Tariff
ROE _(Ref)	=	ROE Component of Tariff established at the time of COD
ER _(Rev)	=	The revised TT & OD selling rate of US dollar as notified by the National Bank of Pakistan
ER _(Ref)	=	Reference Exchange Rate at the time of COD





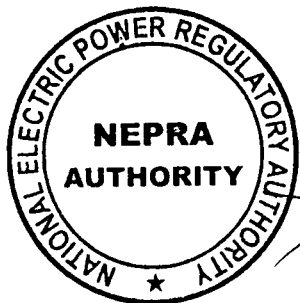
ii) INDEXATION APPLICABLE TO O&M

The O&M component of tariff will be adjusted on account of local Inflation (CPI) and foreign inflation (US CPI) and exchange rate quarterly on 1st July, 1st October, 1st January and 1st April based on the latest available information with respect to CPI notified by the Pakistan Bureau of Statistics (PBS), US CPI issued by US Bureau of Labor Statistics and revised TT & OD selling rate of US Dollar notified by the National Bank of Pakistan as per the following mechanism:

$L O\&M_{(REV)}$	=	$70\% \text{ of } O\&M_{(REF)} * CPI_{(REV)} / CPI_{(REF)}$
$F O\&M_{(REV)}$	=	$30\% \text{ of } O\&M_{(REF)} * US CPI_{(REV)} / US CPI_{(REF)} * ER_{(REV)} / ER_{(REF)}$
Where:		
$L O\&M_{(REV)}$	=	the revised applicable Local O&M Component of tariff
$F O\&M_{(REV)}$	=	the revised applicable Foreign O&M Component of tariff
$O\&M_{(REF)}$	=	the reference O&M component of tariff for North Region Rs. 1.8714/kWh and for South Region Rs. 1.7674/kWh
$CPI_{(REV)}$	=	the revised Consumer Price Index (General) published by Pakistan Bureau of Statistics.
$CPI_{(REF)}$	=	the reference Consumer Price Index (General) of 201.620 for the month of July 2015
$US CPI_{(REV)}$	=	the revised US CPI (All Urban Consumers) published by US Bureau of Labor Statistics
$US CPI_{(REF)}$	=	the reference US CPI (All Urban Consumers) of 238.654 for the month of July 2015
$ER_{(REV)}$	=	the revised TT & OD selling rate of US dollar published by National Bank of Pakistan
$ER_{(REF)}$	=	the reference TT & OD selling rate of RS. 105/US dollar

iii) INDEXATION FOR LIBOR VARIATION

The interest part of fixed charge component will remain unchanged throughout the term except for the adjustment due to variation in interest rate as a result of variation in 3 months LIBOR according to the following formula;





ΔI	=	$P_{(REV)} * (LIBOR_{(REV)} - 0.31\%) / 4$
Where:		
ΔI	=	the variation in interest charges applicable corresponding to variation in 3 months LIBOR. ΔI can be positive or negative depending upon whether $LIBOR_{(REV)}$ is $>$ or $<$ 0.31%. The interest payment obligation will be enhanced or reduced to the extent of ΔI for each quarter under adjustment applicable on quarterly basis.
$P_{(REV)}$	=	The outstanding principal (as indicated in the attached debt service schedule to this order) on a quarterly basis on the relevant quarterly calculation date. Period 1 shall commence on the date on which the 1 st installment is due after availing the grace period.

V. TERMS AND CONDITIONS OF TARIFF

The above tariff and terms and conditions, stipulated hereunder, shall be incorporated in the Energy Purchase Agreement between the Power Purchaser and the Power Producer:

- i. All plant and equipment shall be new and shall be designed, manufactured tested and certified against quality and safety in accordance with the applicable IEC or other relevant standards.
- ii. The verification of the new machinery will be done by the independent engineer at the time of the commissioning of the plant duly verified by the power purchaser.
- iii. The companies interested in availing upfront tariff will submit unconditional formal application to NEPRA for approval by the Authority in accordance with the NEPRA Upfront Tariff (Approval and Procedure) Regulations 2011.
- iv. Capacity Utilization Factors for North and South regions will be 17% and 18% respectively.
- v. In case the actual output exceeds the minimum output, the excess energy shall be charged in accordance with the following mechanism:

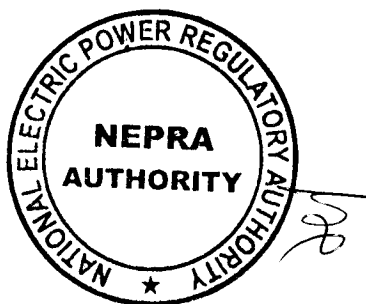
Net Annual Plant Capacity Factors	% of the prevalent tariff
Above 17%/18% to 18%/19%	80%
Above 18%/19% to 19%/20%	90%
Above 19%/20%	100%

- vi. The risk of lower solar irradiation will be on the power producer.



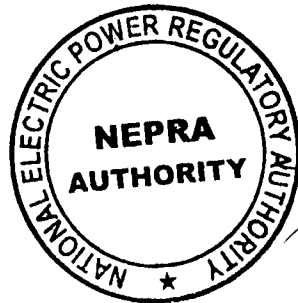


- vii. This upfront tariff will be applicable w.e.f. 1st January 2016 and will remain valid for a period of 6 months i.e. 30th June 2016.
- viii. The applicant will have to achieve financial close within one year from the date of approval of the upfront tariff in favor of the applicant. The upfront tariff granted to the applicant will no longer remain applicable/valid, if financial close is not achieved by the applicant within the stipulated time or generation license is declined to the applicant.
- ix. The tariff control period will be 25 years from the date of commercial operation.
- x. The dispatch will be at appropriate voltage level from 11kV to 220kV mutually agreed between the power purchaser and the power producer.
- xi. The targeted maximum construction period after financial close is 8 months, 10 months and 12 months for $\geq 1\text{MW} \leq 20\text{MW}$, $> 20\text{MW} \leq 50\text{MW}$ and $> 50\text{MW} \leq 100\text{MW}$ projects respectively. No adjustment will be allowed in this tariff to account for financial impact of any delay in project construction. However, the failure of the applicant to complete construction within the stipulated time will not invalidate the tariff granted to it.
- xii. The eligibility criteria for opting upfront solar tariff will be as under:
 - a. The projects whose proposed plant & machinery is confirmed to be new as per undertaking/affidavit to be provided by the project sponsors along with their applications to the Authority for acceptance of upfront tariff.
 - b. The projects having obtained the approval of NTDC/DISCO for Grid connectivity and simulation studies to the effect that solar based power will be evacuated in accordance with the project timeline and further that the power injected through the project will not have any adverse effect on the national grid as required under the Grid Code.
- xiii. The impact of degradation has been accounted for in the tariff and there shall be no separate payment on account of degradation during the entire term of the tariff control period.
- xiv. Pre COD sale of electricity to the power purchaser, if any, shall be allowed subject to the terms and conditions of EPA, at the applicable tariff excluding principal repayment of debt component and interest component.
- xv. In the Upfront Tariff no adjustment for certified emission reductions has been accounted for. However, upon actual realization of carbon credits, the same shall be distributed between the power purchaser and the power producer in accordance with the Policy for Development of Renewable Energy for Power Generation 2006, as amended from time to time.
- xvi. The decision to opt for upfront tariff once exercised will be irrevocable.
- xvii. Debt part of the project financing has been assumed on foreign financing. However, the debt part of the project can also be financed through local financing or mix of local and foreign financing and the debt servicing component will be adjusted accordingly.





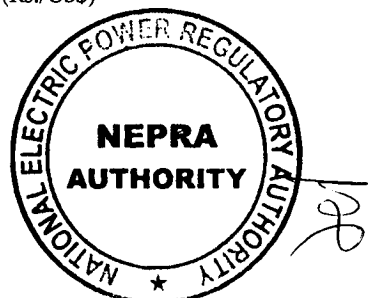
- xviii. The adjustment/indexation of upfront tariff will be made on the basis of benchmarks assumed by the Authority for Upfront Tariff in accordance with the indexation mechanism stipulated herein above and respective Upfront Tariff will be applicable to the solar PV projects coming under the Upfront Tariff regime. No project specific adjustments shall be taken into account.
- xix. In case the company is obligated to pay any tax on its income from generation of electricity, or any duties and/or taxes, not being of refundable nature, are imposed on the company, the exact amount paid by the company on these accounts shall be reimbursed on production of original receipts. This payment shall be considered as a pass-through payment spread over a period of twelve months. However, withholding tax on dividend will not be passed through.
- xx. General assumptions, which are not covered in this determination and National Electric Power Regulatory Authority Upfront Tariff (Approval & Procedure) Regulations, 2011, may be dealt with as per the standard terms of the Energy Purchase Agreement.
- VI. The above Order of the Authority along with 12 Annexes shall be notified in the Official Gazette in terms of Section 31(4) of the Regulations of Generation, Transmission and Distribution of Electric Power Act, 1997.



**Upfront Solar Tariff for $\geq 1\text{MW} \leq 20\text{MW}$
Reference Tariff Table (North)**

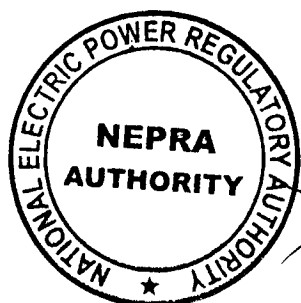
Year	O&M	Insurance	Return on Equity	Debt Servicing	Total Tariff	
	Rs./kWh	Rs./kWh	Rs./kWh	Rs./kWh	Rs./kWh	¢ per kWh
1	1.8714	0.7857	3.8911	8.2154	14.7634	14.0604
2	1.8714	0.7857	3.8911	8.2154	14.7634	14.0604
3	1.8714	0.7857	3.8911	8.2154	14.7634	14.0604
4	1.8714	0.7857	3.8911	8.2154	14.7634	14.0604
5	1.8714	0.7857	3.8911	8.2154	14.7634	14.0604
6	1.8714	0.7857	3.8911	8.2154	14.7634	14.0604
7	1.8714	0.7857	3.8911	8.2154	14.7634	14.0604
8	1.8714	0.7857	3.8911	8.2154	14.7634	14.0604
9	1.8714	0.7857	3.8911	8.2154	14.7634	14.0604
10	1.8714	0.7857	3.8911	8.2154	14.7634	14.0604
11	1.8714	0.7857	3.8911	-	6.5481	6.2363
12	1.8714	0.7857	3.8911	-	6.5481	6.2363
13	1.8714	0.7857	3.8911	-	6.5481	6.2363
14	1.8714	0.7857	3.8911	-	6.5481	6.2363
15	1.8714	0.7857	3.8911	-	6.5481	6.2363
16	1.8714	0.7857	3.8911	-	6.5481	6.2363
17	1.8714	0.7857	3.8911	-	6.5481	6.2363
18	1.8714	0.7857	3.8911	-	6.5481	6.2363
19	1.8714	0.7857	3.8911	-	6.5481	6.2363
20	1.8714	0.7857	3.8911	-	6.5481	6.2363
21	1.8714	0.7857	3.8911	-	6.5481	6.2363
22	1.8714	0.7857	3.8911	-	6.5481	6.2363
23	1.8714	0.7857	3.8911	-	6.5481	6.2363
24	1.8714	0.7857	3.8911	-	6.5481	6.2363
25	1.8714	0.7857	3.8911	-	6.5481	6.2363
Levelized	1.8714	0.7857	3.8911	5.5613	12.1093	11.5327

Installed Capacity (MWp)	20.000
Minimum Annual Energy (GWh)	29.784
CPI (General) July 2015	201.620
US CPI (All Urban Consumers) July 2015	238.654
Exchange Rate (Rs./US\$)	105.000



**Upfront Solar Tariff for $\geq 1\text{MW} \leq 20\text{MW}$
Debt Servicing Schedule**

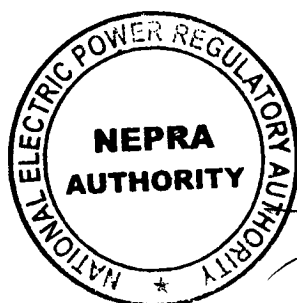
Period	Foreign Debt					Annual Principal Repayment	Annual Interest	Annual Debt Servicing
	Principal	Repayment	Mark-up	Balance	Debt Service			
	US\$/MW	US\$/MW	US\$/MW	US\$/MW	US\$/MW			
1	920,655	18,058	11,071	902,596	29,129	5.19	3.03	8.2154
	902,596	18,276	10,854	884,321	29,129			
	884,321	18,495	10,634	865,825	29,129			
	865,825	18,718	10,412	847,107	29,129			
	847,107	18,943	10,190	828,164	29,129			
	828,164	19,171	9,959	808,994	29,129			
	808,994	19,401	9,728	789,593	29,129			
2	789,593	19,635	9,495	769,958	29,129	5.44	2.78	8.2154
	847,107	77,149	39,368	769,958	116,517			
	769,958	19,871	9,259	750,087	29,129			
	750,087	20,110	9,020	729,978	29,129			
	729,978	20,351	8,778	709,627	29,129			
3	709,627	20,596	8,533	689,030	29,129	5.71	2.51	8.2154
	769,958	80,928	35,590	689,030	116,517			
	689,030	20,844	8,286	668,187	29,129			
	668,187	21,094	8,035	647,092	29,129			
	647,092	21,348	7,781	625,744	29,129			
4	625,744	21,605	7,525	604,139	29,129	5.99	2.23	8.2154
	689,030	84,891	31,626	604,139	116,517			
	604,139	21,865	7,265	582,275	29,129			
	582,275	22,127	7,002	560,147	29,129			
	560,147	22,394	6,736	537,754	29,129			
5	537,754	22,663	6,466	515,091	29,129	6.28	1.94	8.2154
	604,139	89,049	27,469	515,091	116,517			
	515,091	22,935	6,194	492,156	29,129			
	492,156	23,211	5,918	468,944	29,129			
	468,944	23,490	5,639	445,454	29,129			
6	445,454	23,773	5,357	421,681	29,129	6.59	1.63	8.2154
	515,091	93,410	23,108	421,681	116,517			
	421,681	24,059	5,071	397,623	29,129			
	397,623	24,348	4,781	373,275	29,129			
	373,275	24,641	4,489	348,634	29,129			
7	348,634	24,937	4,192	323,697	29,129	6.91	1.31	8.2154
	421,681	97,984	18,533	323,697	116,517			
	323,697	25,237	3,892	298,460	29,129			
	298,460	25,540	3,589	272,920	29,129			
	272,920	25,847	3,282	247,072	29,129			
8	247,072	26,158	2,971	220,914	29,129	7.25	0.97	8.2154
	323,697	102,783	13,734	220,914	116,517			
	220,914	26,473	2,656	194,441	29,129			
	194,441	26,791	2,338	167,650	29,129			
	167,650	27,113	2,016	140,537	29,129			
9	140,537	27,439	1,690	113,097	29,129	7.60	0.61	8.2154
	220,914	107,817	8,701	113,097	116,517			
	113,097	27,769	1,360	85,328	29,129			
	85,328	28,103	1,026	57,224	29,129			
	57,224	28,441	688	28,783	29,129			
10	28,783	28,783	346	(0)	29,129	7.97	0.24	8.2154
	113,097	113,097	3,420	(0)	116,517			



**Upfront Solar Tariff for >20MW≤50MW
Reference Tariff Table (North)**

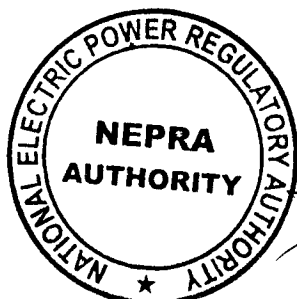
Year	O&M	Insurance	Return on Equity	Debt Servicing	Total Tariff	
	Rs./kWh	Rs./kWh	Rs./kWh	Rs./kWh	Rs./kWh	¢ per kWh
1	1.8714	0.7705	3.8907	8.1038	14.6364	13.9394
2	1.8714	0.7705	3.8907	8.1038	14.6364	13.9394
3	1.8714	0.7705	3.8907	8.1038	14.6364	13.9394
4	1.8714	0.7705	3.8907	8.1038	14.6364	13.9394
5	1.8714	0.7705	3.8907	8.1038	14.6364	13.9394
6	1.8714	0.7705	3.8907	8.1038	14.6364	13.9394
7	1.8714	0.7705	3.8907	8.1038	14.6364	13.9394
8	1.8714	0.7705	3.8907	8.1038	14.6364	13.9394
9	1.8714	0.7705	3.8907	8.1038	14.6364	13.9394
10	1.8714	0.7705	3.8907	8.1038	14.6364	13.9394
11	1.8714	0.7705	3.8907	-	6.5326	6.2215
12	1.8714	0.7705	3.8907	-	6.5326	6.2215
13	1.8714	0.7705	3.8907	-	6.5326	6.2215
14	1.8714	0.7705	3.8907	-	6.5326	6.2215
15	1.8714	0.7705	3.8907	-	6.5326	6.2215
16	1.8714	0.7705	3.8907	-	6.5326	6.2215
17	1.8714	0.7705	3.8907	-	6.5326	6.2215
18	1.8714	0.7705	3.8907	-	6.5326	6.2215
19	1.8714	0.7705	3.8907	-	6.5326	6.2215
20	1.8714	0.7705	3.8907	-	6.5326	6.2215
21	1.8714	0.7705	3.8907	-	6.5326	6.2215
22	1.8714	0.7705	3.8907	-	6.5326	6.2215
23	1.8714	0.7705	3.8907	-	6.5326	6.2215
24	1.8714	0.7705	3.8907	-	6.5326	6.2215
25	1.8714	0.7705	3.8907	-	6.5326	6.2215
Levelized	1.8714	0.7705	3.8907	5.4858	12.0183	11.4460

Installed Capacity (MWp) 50.000
 Minimum Annual Energy (GWh) 74.460
 CPI (General) July 2015 201.620
 US CPI (All Urban Consumers) July 2015 238.654
 Exchange Rate (Rs./US\$) 105.000



**Upfront Solar Tariff for >20MW≤50MW
Debt Servicing Schedule**

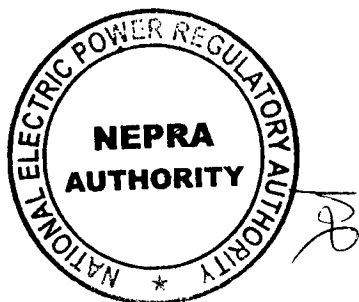
Period	Foreign Debt					Annual Principal Repayment	Annual Interest	Annual Debt Servicing
	Principal	Repayment	Mark-up	Balance	Debt Service			
	US\$/MW	US\$/MW	US\$/MW	US\$/MW	US\$/MW			
1	908,153	17,813	10,921	890,340	28,734	5.12	2.99	8.1038
	890,340	18,027	10,706	872,312	28,734			
	872,312	18,244	10,490	854,068	28,734			
	854,068	18,464	10,270	835,604	28,734			
	908,153	72,549	42,387	835,604	114,935			
	835,604	18,686	10,048	816,919	28,734			
	816,919	18,910	9,823	798,008	28,734			
2	798,008	19,138	9,596	778,871	28,734	5.37	2.74	8.1038
	778,871	19,368	9,366	759,503	28,734			
	835,604	76,102	38,834	759,503	114,935			
	759,503	19,601	9,133	739,902	28,734			
	739,902	19,836	8,897	720,065	28,734			
	720,065	20,075	8,659	699,990	28,734			
	699,990	20,316	8,417	679,674	28,734			
3	759,503	79,829	35,107	679,674	114,935	5.63	2.48	8.1038
	679,674	20,561	8,173	659,113	28,734			
	659,113	20,808	7,926	638,305	28,734			
	638,305	21,058	7,676	617,247	28,734			
	617,247	21,311	7,422	595,936	28,734			
	679,674	83,738	31,197	595,936	114,935			
	595,936	21,568	7,166	574,368	28,734			
4	574,368	21,827	6,907	552,541	28,734	5.90	2.20	8.1038
	552,541	22,089	6,644	530,452	28,734			
	530,452	22,355	6,379	508,096	28,734			
	595,936	87,839	27,096	508,096	114,935			
	508,096	22,624	6,110	485,473	28,734			
	485,473	22,896	5,838	462,577	28,734			
	462,577	23,171	5,562	439,405	28,734			
5	439,405	23,450	5,284	415,955	28,734	6.50	1.61	8.1038
	508,096	92,141	22,794	415,955	114,935			
	415,955	23,732	5,002	392,223	28,734			
	392,223	24,017	4,716	368,206	28,734			
	368,206	24,306	4,428	343,900	28,734			
	343,900	24,598	4,135	319,301	28,734			
	415,955	96,654	18,281	319,301	114,935			
6	319,301	24,894	3,840	294,407	28,734	6.81	1.29	8.1038
	294,407	25,194	3,540	269,214	28,734			
	269,214	25,497	3,237	243,717	28,734			
	243,717	25,803	2,931	217,914	28,734			
	319,301	101,387	13,548	217,914	114,935			
	217,914	26,113	2,620	191,801	28,734			
	191,801	26,427	2,306	165,373	28,734			
7	165,373	26,745	1,989	138,628	28,734	7.15	0.96	8.1038
	138,628	27,067	1,667	111,561	28,734			
	217,914	106,353	8,582	111,561	114,935			
	111,561	27,392	1,342	84,169	28,734			
	84,169	27,722	1,012	56,447	28,734			
	56,447	28,055	679	28,392	28,734			
	28,392	28,392	341	(0)	28,734			
8	111,561	111,561	3,374	(0)	114,935	7.87	0.24	8.1038
	111,561	111,561	3,374	(0)	114,935			



**Upfront Solar Tariff for >50MW≤100MW
Reference Tariff Table (North)**

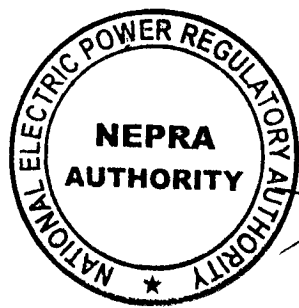
Year	O&M	Insurance	Return on Equity	Debt Servicing	Total Tariff	
	Rs./kWh	Rs./kWh	Rs./kWh	Rs./kWh	Rs./kWh	¢ per kWh
1	1.8714	0.7554	3.8880	7.9905	14.5053	13.8145
2	1.8714	0.7554	3.8880	7.9905	14.5053	13.8145
3	1.8714	0.7554	3.8880	7.9905	14.5053	13.8145
4	1.8714	0.7554	3.8880	7.9905	14.5053	13.8145
5	1.8714	0.7554	3.8880	7.9905	14.5053	13.8145
6	1.8714	0.7554	3.8880	7.9905	14.5053	13.8145
7	1.8714	0.7554	3.8880	7.9905	14.5053	13.8145
8	1.8714	0.7554	3.8880	7.9905	14.5053	13.8145
9	1.8714	0.7554	3.8880	7.9905	14.5053	13.8145
10	1.8714	0.7554	3.8880	7.9905	14.5053	13.8145
11	1.8714	0.7554	3.8880	-	6.5148	6.2045
12	1.8714	0.7554	3.8880	-	6.5148	6.2045
13	1.8714	0.7554	3.8880	-	6.5148	6.2045
14	1.8714	0.7554	3.8880	-	6.5148	6.2045
15	1.8714	0.7554	3.8880	-	6.5148	6.2045
16	1.8714	0.7554	3.8880	-	6.5148	6.2045
17	1.8714	0.7554	3.8880	-	6.5148	6.2045
18	1.8714	0.7554	3.8880	-	6.5148	6.2045
19	1.8714	0.7554	3.8880	-	6.5148	6.2045
20	1.8714	0.7554	3.8880	-	6.5148	6.2045
21	1.8714	0.7554	3.8880	-	6.5148	6.2045
22	1.8714	0.7554	3.8880	-	6.5148	6.2045
23	1.8714	0.7554	3.8880	-	6.5148	6.2045
24	1.8714	0.7554	3.8880	-	6.5148	6.2045
25	1.8714	0.7554	3.8880	-	6.5148	6.2045
Levelized	1.8714	0.7554	3.8880	5.4091	11.9238	11.3560

Installed Capacity (MWp)	100.000
Minimum Annual Energy (GWh)	148.920
CPI (General) July 2015	201.620
US CPI (All Urban Consumers) July 2015	238.654
Exchange Rate (Rs./US\$)	105.000



**Upfront Solar Tariff for >50MW≤100MW
Debt Servicing Schedule**

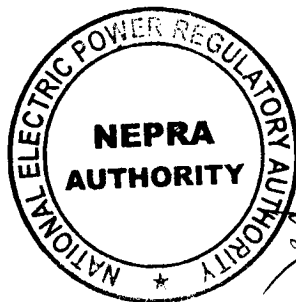
Period	Foreign Debt					Annual Principal Repayment	Annual Interest	Annual Debt Servicing
	Principal	Repayment	Mark-up	Balance	Debt Service			
	US\$/MW	US\$/MW	US\$/MW	US\$/MW	US\$/MW			
1	895,455	17,564	10,768	877,891	28,332	5.04	2.95	7.9905
	877,891	17,775	10,557	860,115	28,332			
	860,115	17,989	10,343	842,126	28,332			
	842,126	18,205	10,127	823,921	28,332			
	895,455	71,534	41,794	823,921	113,328			
	823,921	18,424	9,908	805,496	28,332			
	805,496	18,646	9,686	786,850	28,332			
2	786,850	18,870	9,462	767,980	28,332	5.29	2.70	7.9905
	767,980	19,097	9,235	748,883	28,332			
	823,921	75,038	38,291	748,883	113,328			
	748,883	19,327	9,005	729,556	28,332			
	729,556	19,559	8,773	709,997	28,332			
3	709,997	19,794	8,538	690,203	28,332	5.55	2.44	7.9905
	690,203	20,032	8,300	670,171	28,332			
	748,883	78,712	34,616	670,171	113,328			
	670,171	20,273	8,059	649,897	28,332			
	649,897	20,517	7,815	629,380	28,332			
4	629,380	20,764	7,568	608,617	28,332	5.82	2.17	7.9905
	608,617	21,013	7,319	587,603	28,332			
	670,171	82,567	30,761	587,603	113,328			
	587,603	21,266	7,066	566,337	28,332			
	566,337	21,522	6,810	544,815	28,332			
5	544,815	21,781	6,551	523,035	28,332	6.11	1.88	7.9905
	523,035	22,043	6,289	500,992	28,332			
	587,603	86,611	26,717	500,992	113,328			
	500,992	22,308	6,024	478,684	28,332			
	478,684	22,576	5,756	456,109	28,332			
6	456,109	22,847	5,485	433,261	28,332	6.41	1.58	7.9905
	433,261	23,122	5,210	410,139	28,332			
	500,992	90,853	22,475	410,139	113,328			
	410,139	23,400	4,932	386,739	28,332			
	386,739	23,681	4,651	363,058	28,332			
7	363,058	23,966	4,366	339,091	28,332	6.72	1.27	7.9905
	339,091	24,254	4,078	314,837	28,332			
	410,139	95,302	18,026	314,837	113,328			
	314,837	24,546	3,786	290,291	28,332			
	290,291	24,841	3,491	265,449	28,332			
8	265,449	25,140	3,192	240,309	28,332	7.05	0.94	7.9905
	240,309	25,442	2,890	214,867	28,332			
	314,837	99,970	13,358	214,867	113,328			
	214,867	25,748	2,584	189,119	28,332			
	189,119	26,058	2,274	163,061	28,332			
9	163,061	26,371	1,961	136,690	28,332	7.39	0.60	7.9905
	136,690	26,688	1,644	110,001	28,332			
	214,867	104,866	8,462	110,001	113,328			
	110,001	27,009	1,323	82,992	28,332			
	82,992	27,334	998	55,658	28,332			
10	55,658	27,663	669	27,995	28,332	7.76	0.23	7.9905
	27,995	27,995	337	(0)	28,332			
	110,001	110,001	3,327	(0)	113,328			



**Upfront Solar Tariff for $\geq 1\text{MW} \leq 20\text{MW}$
Reference Tariff Table (South)**

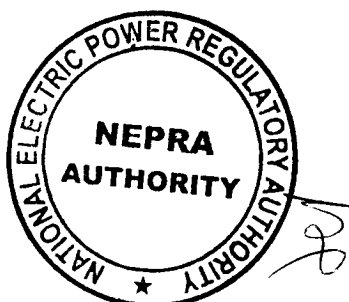
Year	O&M	Insurance	Return on Equity	Debt Servicing	Total Tariff	
	Rs./kWh	Rs./kWh	Rs./kWh	Rs./kWh	Rs./kWh	¢ per kWh
1	1.7674	0.7420	3.6749	7.7590	13.9432	13.2793
2	1.7674	0.7420	3.6749	7.7590	13.9432	13.2793
3	1.7674	0.7420	3.6749	7.7590	13.9432	13.2793
4	1.7674	0.7420	3.6749	7.7590	13.9432	13.2793
5	1.7674	0.7420	3.6749	7.7590	13.9432	13.2793
6	1.7674	0.7420	3.6749	7.7590	13.9432	13.2793
7	1.7674	0.7420	3.6749	7.7590	13.9432	13.2793
8	1.7674	0.7420	3.6749	7.7590	13.9432	13.2793
9	1.7674	0.7420	3.6749	7.7590	13.9432	13.2793
10	1.7674	0.7420	3.6749	7.7590	13.9432	13.2793
11	1.7674	0.7420	3.6749	-	6.1843	5.8898
12	1.7674	0.7420	3.6749	-	6.1843	5.8898
13	1.7674	0.7420	3.6749	-	6.1843	5.8898
14	1.7674	0.7420	3.6749	-	6.1843	5.8898
15	1.7674	0.7420	3.6749	-	6.1843	5.8898
16	1.7674	0.7420	3.6749	-	6.1843	5.8898
17	1.7674	0.7420	3.6749	-	6.1843	5.8898
18	1.7674	0.7420	3.6749	-	6.1843	5.8898
19	1.7674	0.7420	3.6749	-	6.1843	5.8898
20	1.7674	0.7420	3.6749	-	6.1843	5.8898
21	1.7674	0.7420	3.6749	-	6.1843	5.8898
22	1.7674	0.7420	3.6749	-	6.1843	5.8898
23	1.7674	0.7420	3.6749	-	6.1843	5.8898
24	1.7674	0.7420	3.6749	-	6.1843	5.8898
25	1.7674	0.7420	3.6749	-	6.1843	5.8898
Levelized	1.7674	0.7420	3.6749	5.2523	11.4366	10.8920

Installed Capacity (MWp)	20.000
Minimum Annual Energy (GWh)	31.536
CPI (General) July 2015	201.620
US CPI (All Urban Consumers) July 2015	238.654
Exchange Rate (Rs./US\$)	105.000



**Upfront Solar Tariff for $\geq 1\text{MW} \leq 20\text{MW}$
Debt Servicing Schedule**

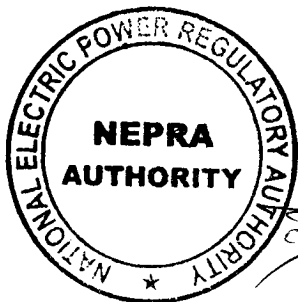
Period	Foreign Debt					Annual Principal Repayment	Annual Interest	Annual Debt Servicing
	Principal	Repayment	Mark-up	Balance	Debt Service			
	US\$/MW	US\$/MW	US\$/MW	US\$/MW	US\$/MW			
1	920,655	18,058	11,071	902,596	29,129	4.90	2.86	7.7590
	902,596	18,276	10,854	884,321	29,129			
	884,321	18,495	10,634	865,825	29,129			
	865,825	18,718	10,412	847,107	29,129			
	920,655	73,547	42,970	847,107	116,517			
	847,107	18,943	10,186	828,164	29,129			
	828,164	19,171	9,959	808,994	29,129			
	808,994	19,401	9,728	789,593	29,129			
2	789,593	19,635	9,495	769,958	29,129	5.14	2.62	7.7590
	847,107	77,149	39,368	769,958	116,517			
	769,958	19,871	9,259	750,087	29,129			
	750,087	20,110	9,020	729,978	29,129			
3	729,978	20,351	8,778	709,627	29,129	5.39	2.37	7.7590
	709,627	20,596	8,533	689,030	29,129			
	769,958	80,928	35,590	689,030	116,517			
	689,030	20,844	8,286	668,187	29,129			
	668,187	21,094	8,035	647,092	29,129			
	647,092	21,348	7,781	625,744	29,129			
4	625,744	21,605	7,525	604,139	29,129	5.65	2.11	7.7590
	689,030	84,891	31,626	604,139	116,517			
	604,139	21,865	7,265	582,275	29,129			
	582,275	22,127	7,002	560,147	29,129			
	560,147	22,394	6,736	537,754	29,129			
5	537,754	22,663	6,466	515,091	29,129	5.93	1.83	7.7590
	604,139	89,049	27,469	515,091	116,517			
	515,091	22,935	6,194	492,156	29,129			
	492,156	23,211	5,918	468,944	29,129			
	468,944	23,490	5,639	445,454	29,129			
	445,454	23,773	5,357	421,681	29,129			
6	515,091	93,410	23,108	421,681	116,517	6.22	1.54	7.7590
	421,681	24,059	5,071	397,623	29,129			
	397,623	24,348	4,781	373,275	29,129			
	373,275	24,641	4,489	348,634	29,129			
	348,634	24,937	4,192	323,697	29,129			
7	421,681	97,984	18,533	323,697	116,517	6.52	1.23	7.7590
	323,697	25,237	3,892	298,460	29,129			
	298,460	25,540	3,589	272,920	29,129			
	272,920	25,847	3,282	247,072	29,129			
	247,072	26,158	2,971	220,914	29,129			
8	323,697	102,783	13,734	220,914	116,517	6.84	0.91	7.7590
	220,914	26,473	2,656	194,441	29,129			
	194,441	26,791	2,338	167,650	29,129			
	167,650	27,113	2,016	140,537	29,129			
	140,537	27,439	1,690	113,097	29,129			
9	220,914	107,817	8,701	113,097	116,517	7.18	0.58	7.7590
	113,097	27,769	1,360	85,328	29,129			
	85,328	28,103	1,026	57,224	29,129			
	57,224	28,441	688	28,783	29,129			
10	28,783	28,783	346	(0)	29,129	7.53	0.23	7.7590
	113,097	113,097	3,420	(0)	116,517			



**Upfront Solar Tariff for >20MW≤50MW
Reference Tariff Table (South)**

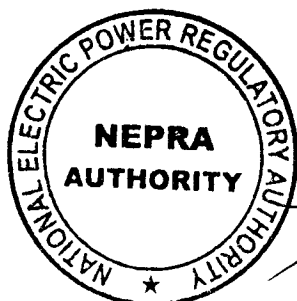
Year	O&M	Insurance	Return on Equity	Debt Servicing	Total Tariff	
	Rs./kWh	Rs./kWh	Rs./kWh	Rs./kWh	Rs./kWh	¢ per kWh
1	1.7674	0.7277	3.6745	7.6536	13.8232	13.1650
2	1.7674	0.7277	3.6745	7.6536	13.8232	13.1650
3	1.7674	0.7277	3.6745	7.6536	13.8232	13.1650
4	1.7674	0.7277	3.6745	7.6536	13.8232	13.1650
5	1.7674	0.7277	3.6745	7.6536	13.8232	13.1650
6	1.7674	0.7277	3.6745	7.6536	13.8232	13.1650
7	1.7674	0.7277	3.6745	7.6536	13.8232	13.1650
8	1.7674	0.7277	3.6745	7.6536	13.8232	13.1650
9	1.7674	0.7277	3.6745	7.6536	13.8232	13.1650
10	1.7674	0.7277	3.6745	7.6536	13.8232	13.1650
11	1.7674	0.7277	3.6745	-	6.1696	5.8758
12	1.7674	0.7277	3.6745	-	6.1696	5.8758
13	1.7674	0.7277	3.6745	-	6.1696	5.8758
14	1.7674	0.7277	3.6745	-	6.1696	5.8758
15	1.7674	0.7277	3.6745	-	6.1696	5.8758
16	1.7674	0.7277	3.6745	-	6.1696	5.8758
17	1.7674	0.7277	3.6745	-	6.1696	5.8758
18	1.7674	0.7277	3.6745	-	6.1696	5.8758
19	1.7674	0.7277	3.6745	-	6.1696	5.8758
20	1.7674	0.7277	3.6745	-	6.1696	5.8758
21	1.7674	0.7277	3.6745	-	6.1696	5.8758
22	1.7674	0.7277	3.6745	-	6.1696	5.8758
23	1.7674	0.7277	3.6745	-	6.1696	5.8758
24	1.7674	0.7277	3.6745	-	6.1696	5.8758
25	1.7674	0.7277	3.6745	-	6.1696	5.8758
Levelized	1.7674	0.7277	3.6745	5.1810	11.3506	10.8101

Installed Capacity (MWp) 50.000
 Minimum Annual Energy (GWh) 78.840
 CPI (General) July 2015 201.620
 US CPI (All Urban Consumers) July 2015 238.654
 Exchange Rate (Rs./US\$) 105.000



**Upfront Solar Tariff for >20MW≤50MW
Debt Servicing Schedule**

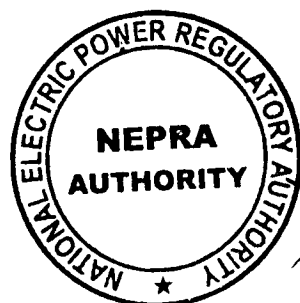
Period	Foreign Debt					Annual Principal Repayment	Annual Interest	Annual Debt Servicing
	Principal	Repayment	Mark-up	Balance	Debt Service			
	US\$/MW	US\$/MW	US\$/MW	US\$/MW	US\$/MW			
1	908,153	17,813	10,921	890,340	28,734	4.83	2.82	7.6536
	890,340	18,027	10,706	872,312	28,734			
	872,312	18,244	10,490	854,068	28,734			
	854,068	18,464	10,270	835,604	28,734			
	908,153	72,549	42,387	835,604	114,935			
	835,604	18,686	10,048	816,919	28,734			
2	816,919	18,910	9,823	798,008	28,734	5.07	2.59	7.6536
	798,008	19,138	9,596	778,871	28,734			
	778,871	19,368	9,366	759,503	28,734			
	835,604	76,102	38,834	759,503	114,935			
	759,503	19,601	9,133	739,902	28,734			
	739,902	19,836	8,897	720,065	28,734			
3	720,065	20,075	8,659	699,990	28,734	5.32	2.34	7.6536
	699,990	20,316	8,417	679,674	28,734			
	759,503	79,829	35,107	679,674	114,935			
	679,674	20,561	8,173	659,113	28,734			
	659,113	20,808	7,926	638,305	28,734			
	638,305	21,058	7,676	617,247	28,734			
4	617,247	21,311	7,422	595,936	28,734	5.58	2.08	7.6536
	679,674	83,738	31,197	595,936	114,935			
	595,936	21,568	7,166	574,368	28,734			
	574,368	21,827	6,907	552,541	28,734			
	552,541	22,089	6,644	530,452	28,734			
	530,452	22,355	6,379	508,096	28,734			
5	595,936	87,839	27,096	508,096	114,935	5.85	1.80	7.6536
	508,096	22,624	6,110	485,473	28,734			
	485,473	22,896	5,838	462,577	28,734			
	462,577	23,171	5,562	439,405	28,734			
	439,405	23,450	5,284	415,955	28,734			
	508,096	92,141	22,794	415,955	114,935			
6	415,955	23,732	5,002	392,223	28,734	6.14	1.52	7.6536
	392,223	24,017	4,716	368,206	28,734			
	368,206	24,306	4,428	343,900	28,734			
	343,900	24,598	4,135	319,301	28,734			
	415,955	96,654	18,281	319,301	114,935			
	319,301	24,894	3,840	294,407	28,734			
7	294,407	25,194	3,540	269,214	28,734	6.44	1.22	7.6536
	269,214	25,497	3,237	243,717	28,734			
	243,717	25,803	2,931	217,914	28,734			
	319,301	101,387	13,548	217,914	114,935			
	217,914	26,113	2,620	191,801	28,734			
	191,801	26,427	2,306	165,373	28,734			
8	165,373	26,745	1,989	138,628	28,734	6.75	0.90	7.6536
	138,628	27,067	1,667	111,561	28,734			
	217,914	106,353	8,582	111,561	114,935			
	111,561	27,392	1,342	84,169	28,734			
	84,169	27,722	1,012	56,447	28,734			
	56,447	28,055	679	28,392	28,734			
9	28,392	28,392	341	(0)	28,734	7.08	0.57	7.6536
	111,561	111,561	3,374	(0)	114,935			
	111,561	111,561	3,374	(0)	114,935			
10	111,561	111,561	3,374	(0)	114,935	7.43	0.22	7.6536



**Upfront Solar Tariff for >50MW≤100MW
Reference Tariff Table (South)**

Year	O&M	Insurance	Return on Equity	Debt Servicing	Total Tariff	
	Rs./kWh	Rs./kWh	Rs./kWh	Rs./kWh	Rs./kWh	¢ per kWh
1	1.7674	0.7135	3.6720	7.5466	13.6994	13.0471
2	1.7674	0.7135	3.6720	7.5466	13.6994	13.0471
3	1.7674	0.7135	3.6720	7.5466	13.6994	13.0471
4	1.7674	0.7135	3.6720	7.5466	13.6994	13.0471
5	1.7674	0.7135	3.6720	7.5466	13.6994	13.0471
6	1.7674	0.7135	3.6720	7.5466	13.6994	13.0471
7	1.7674	0.7135	3.6720	7.5466	13.6994	13.0471
8	1.7674	0.7135	3.6720	7.5466	13.6994	13.0471
9	1.7674	0.7135	3.6720	7.5466	13.6994	13.0471
10	1.7674	0.7135	3.6720	7.5466	13.6994	13.0471
11	1.7674	0.7135	3.6720	-	6.1528	5.8598
12	1.7674	0.7135	3.6720	-	6.1528	5.8598
13	1.7674	0.7135	3.6720	-	6.1528	5.8598
14	1.7674	0.7135	3.6720	-	6.1528	5.8598
15	1.7674	0.7135	3.6720	-	6.1528	5.8598
16	1.7674	0.7135	3.6720	-	6.1528	5.8598
17	1.7674	0.7135	3.6720	-	6.1528	5.8598
18	1.7674	0.7135	3.6720	-	6.1528	5.8598
19	1.7674	0.7135	3.6720	-	6.1528	5.8598
20	1.7674	0.7135	3.6720	-	6.1528	5.8598
21	1.7674	0.7135	3.6720	-	6.1528	5.8598
22	1.7674	0.7135	3.6720	-	6.1528	5.8598
23	1.7674	0.7135	3.6720	-	6.1528	5.8598
24	1.7674	0.7135	3.6720	-	6.1528	5.8598
25	1.7674	0.7135	3.6720	-	6.1528	5.8598
Levelized	1.7674	0.7135	3.6720	5.1085	11.2614	10.7251

Installed Capacity (MWp)	100.000
Minimum Annual Energy (GWh)	157.680
CPI (General) July 2015	201.620
US CPI (All Urban Consumers) July 2015	238.654
Exchange Rate (Rs./US\$)	105.000



**Upfront Solar Tariff for >50MW≤100MW
Debt Servicing Schedule**

Period	Foreign Debt					Annual Principal Repayment	Annual Interest	Annual Debt Servicing
	Principal	Repayment	Mark-up	Balance	Debt Service			
	US\$/MW	US\$/MW	US\$/MW	US\$/MW	US\$/MW			
1	895,455	17,564	10,768	877,891	28,332	4.76	2.78	7.5466
	877,891	17,775	10,557	860,115	28,332			
	860,115	17,989	10,343	842,126	28,332			
	842,126	18,205	10,127	823,921	28,332			
	895,455	71,534	41,794	823,921	113,328			
	823,921	18,424	9,908	805,496	28,332			
	805,496	18,646	9,686	786,850	28,332			
2	786,850	18,870	9,462	767,980	28,332	5.00	2.55	7.5466
	767,980	19,097	9,235	748,883	28,332			
	823,921	75,038	38,291	748,883	113,328			
	748,883	19,327	9,005	729,556	28,332			
	729,556	19,559	8,773	709,997	28,332			
3	709,997	19,794	8,538	690,203	28,332	5.24	2.31	7.5466
	690,203	20,032	8,300	670,171	28,332			
	748,883	78,712	34,616	670,171	113,328			
	670,171	20,273	8,059	649,897	28,332			
	649,897	20,517	7,815	629,380	28,332			
4	629,380	20,764	7,568	608,617	28,332	5.50	2.05	7.5466
	608,617	21,013	7,319	587,603	28,332			
	670,171	82,567	30,761	587,603	113,328			
	587,603	21,266	7,066	566,337	28,332			
	566,337	21,522	6,810	544,815	28,332			
5	544,815	21,781	6,551	523,035	28,332	5.77	1.78	7.5466
	523,035	22,043	6,289	500,992	28,332			
	587,603	86,611	26,717	500,992	113,328			
	500,992	22,308	6,024	478,684	28,332			
	478,684	22,576	5,756	456,109	28,332			
6	456,109	22,847	5,485	433,261	28,332	6.05	1.50	7.5466
	433,261	23,122	5,210	410,139	28,332			
	500,992	90,853	22,475	410,139	113,328			
	410,139	23,400	4,932	386,739	28,332			
	386,739	23,681	4,651	363,058	28,332			
7	363,058	23,966	4,366	339,091	28,332	6.35	1.20	7.5466
	339,091	24,254	4,078	314,837	28,332			
	410,139	95,302	18,026	314,837	113,328			
	314,837	24,546	3,786	290,291	28,332			
	290,291	24,841	3,491	265,449	28,332			
8	265,449	25,140	3,192	240,309	28,332	6.66	0.89	7.5466
	240,309	25,442	2,890	214,867	28,332			
	314,837	99,970	13,358	214,867	113,328			
	214,867	25,748	2,584	189,119	28,332			
	189,119	26,058	2,274	163,061	28,332			
9	163,061	26,371	1,961	136,690	28,332	6.98	0.56	7.5466
	136,690	26,688	1,644	110,001	28,332			
	214,867	104,866	8,462	110,001	113,328			
	110,001	27,009	1,323	82,992	28,332			
	82,992	27,334	998	55,658	28,332			
10	55,658	27,663	669	27,995	28,332	7.33	0.22	7.5466
	27,995	27,995	337	(0)	28,332			
	110,001	110,001	3,327	(0)	113,328			

