

GOVERNMENT OF INDIA  
MINISTRY OF NEW AND RENEWABLE ENERGY  
**LOK SABHA**  
**STARRED QUESTION NO. 68**  
TO BE ANSWERED ON 28.04.2016

**SOLAR POWER PLANTS**

\*68. SHRI C.R. CHAUDHARY:  
SHRI LAKHAN LAL SAHU:

Will the Minister of New and Renewable Energy be pleased to state:

- (a) the number of solar power plants set up and the present status of setting up of the ongoing solar power plants along with their installed capacity, State/UT-wise;
- (b) whether the Government proposes to introduce grant/loan to promote use of solar energy in collaboration with the National Bank for Agriculture and Rural Development (NABARD), if so, the details thereof;
- (c) whether the Government proposes to provide necessary solar energy equipment for implementation of the said scheme and if so, the details thereof;
- (d) the details of proposals received by the Union Government from various State Governments including Rajasthan and Madhya Pradesh for setting up of solar power plants and developing solar cities during the last three years and the current year, and the action taken by the Union Government thereon, State-wise; and
- (e) the details of the guidelines issued by the Union Government to the States for setting up of solar power plants?

ANSWER

THE MINISTER OF STATE FOR POWER, COAL & NEW AND RENEWABLE ENERGY  
(INDEPENDENT CHARGE) (SHRI PIYUSH GOYAL)

**(a),(b),(c),(d)&e):** A Statement is laid on the Table of the House.

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STATEMENT

STATEMENT REFERRED TO IN REPLY TO LOK SABHA STARRED QUESTION  
NO. 68 FOR 28.4.2016

**(a):** Grid connected solar power plants of 6763 MW capacity in total have been installed in the country upto 31.3.2016. State-wise capacity of solar plants installed is given at Annexure-I. A capacity of around 10,500 MW has been planned for 2016-17 for which tenders of around 11,100 MW have been awarded.

**(b):** Yes, Madam. Ministry of New & Renewable Energy (MNRE) is implementing Solar Lighting and small solar systems through National Bank for Agriculture and Rural Development (NABARD) and is providing 40% capital subsidy with mandatory loan for installation of solar power packs of upto 300 Wp to individuals.

**(c):** MNRE has empanelled suppliers for providing Solar systems under NABARD Scheme and solar energy equipments are already available in the country.

**(d):** The Government has sanctioned the proposals received from various State Governments in accordance with respective scheme guidelines for setting up of solar power plants and developing solar cities. State-wise details of such projects including solar cities sanctioned during last three years are given at Annexure-II.

**(e):** For setting up of solar power plants, the Government has launched the following Grid Connected solar schemes, the details of which are given at Annexure-III:-

- (i) Scheme for Development of Solar Parks and Ultra Mega Solar Power Projects,
- (ii) Scheme for Development of Solar PV Power Plants on Canal Banks/ Canal Tops.
- (iii) Scheme for setting up 300 MW of Grid connected Solar PV Power Projects by Defence Establishments under Ministry of Defence and Para Military Forces with Viability Gap Funding.
- (iv) Implementation of scheme of setting up 1000 MW of Grid- Connected Solar PV Power Projects by Central Public Sector Undertakings with Viability Gap Funding.
- (v) Implementation of Scheme for setting up of 15000 MW of Grid connected Solar PV Power Projects by NTPC/NVVN.
- (vi) Setting up of 2000 MW Grid connected solar power with Viability Gap Funding through Solar Energy Corporation of India (SECI).

The schemes and the respective guidelines are uploaded on MNRE's website.

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**ANNEXURE-I REFERRED TO IN REPLY TO PART (a) OF LOK SABHA STARRED  
QUESTION NO. 68 FOR REPLY ON 28.4.2016  
COMMISSIONING STATUS OF GRID CONNECTED SOLAR POWER PROJECTS UNDER JNNSM**

<b>Sr. No.</b>	<b>State/UT</b>	<b>Total cumulative commissioned capacity till 31-03-16 (MW)</b>
1	Andhra Pradesh	572.966
2	Arunachal Pradesh	0.265
3	Bihar	5.100
4	Chhattisgarh	93.580
5	Gujarat	1119.173
6	Haryana	15.387
7	Jharkhand	16.186
8	Karnataka	145.462
9	Kerala	13.045
10	Madhya Pradesh	776.370
11	Maharashtra	385.756
12	Odisha	66.920
13	Punjab	405.063
14	Rajasthan	1269.932
15	Tamil Nadu	1061.820
16	Telangana	527.843
17	Tripura	5
18	Uttar Pradesh	143.495
19	Uttarakhand	41.145
20	West Bengal	7.772
21	Andaman & Nicobar	5.100
22	Delhi	14.28
23	Lakshadweep	0.750
24	Puducherry	0.025
25	Chandigarh	6.806
26	Daman & Diu	4
27	J&K	1
28	Himachal Pradesh	0.201
29	Mizoram	0.100
30	Others(PSU/channel partner )under Rooftop	58.311
<b>TOTAL</b>		<b>6762.853</b>

**ANNEXURE-II REFERRED TO IN REPLY TO PART (d) OF LOK SABHA  
STARRED QUESTION NO. 68 FOR REPLY ON 28.4.2016**

**(a) List of Solar Parks approved**

Sl. No.	State	Capacity (MW)	Land identified at
1.	Andhra Pradesh	1500	NP Kunta of Anantpuramu & Galiveedu of Kadapa Districts
2.	Andhra Pradesh	1000	Kurnool District
3.	Andhra Pradesh	1000	Galiveedu Madal, Kadapa district
4.	Andhra Pradesh	500	Talaricheruvu Village, Tadipathri Mandal, Anathapuramu District of Andhra Pradesh
5.	Arunachal Pradesh	100	Tezu township in Lohit district
6.	Assam	69	Amguri in Sibsagar district
7.	Chhattisgarh	500	Rajnandgaon, Janjgir Champa districts
8.	Gujarat	700	Radhanesda, Vav, Distt. Banaskantha
9.	Haryana	500	Bugan in Hisar district, Baralu and Singhani in Bhiwani district and Daukhera in Mahendergarh district
10.	Himachal Pradesh	1000	Spiti Valley of Lahaul & Spiti District
11.	Jammu & Kashmir	100	Mohagarh and Badla Brahmana, District-Samba
12.	Karnataka	2000	Pavagada taluk Tumkur dist.

Sl. No.	State	Capacity (MW)	Land identified at
13.	Kerala	200	Paivalike, Meenja, Kinanoor, Kraindalam and Ambalathara villages of Kasargode district
14.	Madhya Pradesh	750	Rewa, MP
15	Madhya Pradesh	1000	Neemuch, Agar and Mandsaur
16.	Madhya Pradesh	500	Rajgarh and Shajapur
17.	Madhya Pradesh	500	Chhattarpur and Morena
18.	Maharashtra	500	Sakri, Dhule district of Maharashtra
19.	Maharashtra	500	Dondaicha, district Dhule, Maharashtra
20.	Maharashtra	500	Taluka Patoda, district Beed, Maharashtra
21.	Meghalaya	20	West Jaintia Hills & East Jaintia Hills districts
22.	Nagaland	60	Dimapur, Kohima and New Peren districts
23.	Odisha	1000	Balasore, Keonjhar, Deogarh, Boudh, Kalahandi and Angul
24.	Rajasthan	680	Bhadla Phase II, Bhadla, Rajasthan
25.	Rajasthan	1000	Bhadla Phase III, Bhadla, Rajasthan
26.	Rajasthan	750	Villages Ugraas, Nagnechinagar & Dandhu, tehsil Phalodi, dist Jodhpur (450 MW) and villages Lavan &

Sl. No.	State	Capacity (MW)	Land identified at
			Purohitsar, tehsil Pokaran, dist Jaisalmer (300 MW)
27.	Rajasthan	500	Bhadla Phase IV, Bhadla, Jodhpur Rajasthan
28.	Rajasthan (321 MW through support of Gol out of 1500 MW)	321	Fatehgarh & Pokaran, Jaisalmer, Rajasthan
29.	Telangana	500	Gattu, Mehboob Nagar Distt.
30.	Uttar Pradesh	600	Jalaun, Allahabad, Mirzapur and Kanpur Dehat districts
31.	Uttarakhand	50	Industrial Area, Sitarganj (Phase I), Industrial Area, Sitarganj (Phase II) and Industrial Area, kashipur
32.	West Bengal	500	East Mednipur, West Mednipur, Bankura
33.	<b>TOTAL</b>	<b>19400</b>	

**(b) Canal Top and Canal Bank projects approved**

**State-wise Allocation of 50 MW Canal-Top Solar PV projects**

Sl. No.	State	Implementing Agency in the State	Capacity for which in-principle approval has been given (MW)
1	Andhra Pradesh	New and Renewable Energy Development Corporation of Andhra Pradesh (NREDCAP)	1 MW canal-top
2	Gujarat	SardarSarovar Narmada Nigam Limited (SSNNL)	10 MW canal-top
3	Karnataka	Krishna Bhagya Jala Nigam Limited (KBJNL)	10 MW canal-top
4	Kerala	Kerala State Electricity Board	2 MW canal-top

		Limited (KSEB)	
5	Punjab	Punjab Energy Development Agency (PEDA)	20 MW canal-top
6	Uttarakhand	Uttarakhand Jal Vidyut Nigam Limited	1 MW canal-top
7	Uttar Pradesh	Uttar Pradesh Irrigation Department	6 MW canal-top (3.5 MW + 2.5 MW)
	<b>Total</b>		<b>50 MW canal-top</b>

#### **State-wise Allocation of 50 MW Canal-Bank Solar PV Projects**

<b>Sl. No.</b>	<b>State</b>	<b>Implementing Agency in the State</b>	<b>Capacity for which in-principle approval has been given (MW)</b>
1	Andhra Pradesh	Andhra Pradesh Power Generation Corporation Limited (APGENCO)	5 MW canal-bank
2	Gujarat	SardarSarovar Narmada Nigam Limited (SSNNL)	15 MW canal-bank
3	Kerala	Kerala State Electricity Board Limited (KSEB)	1 MW canal-bank
4	Uttarakhand	Uttarakhand Jal Vidyut Nigam Limited	19 MW canal-bank
5	West Bengal	West Bengal State Electricity Development Corporation Limited (WBSEDCL)	10 MW canal-bank
	<b>Total</b>		<b>50 MW canal-bank</b>

#### **(c) List of Selected Solar Cities under “Development of Solar Cities Programme”**

<b>Sr. No</b>	<b>State</b>	<b>Approved Solar Cities</b>
1	Andhra Pradesh	1. Vijayawada
		2. Narsapur Town
		3. Kakinada
2	Assam	4. Guwahati
		5. Jorhat
3	Arunachal Pradesh	6. Itanagar
4	Bihar	7. Gaya
5	Chandigarh	8. Chandigarh
6	Chhattisgarh	9. Bilaspur
		10. Raipur
7	Gujarat	11. Rajkot
		12. Gandhinagar
		13. Surat
8	Goa	14. Panaji City
9	Haryana	15. Gurgaon
		16. Faridabad
10	Himachal Pradesh	17. Shimla

Sr. No	State	Approved Solar Cities
		18. Hamirpur
11	Karnataka	19. Mysore
		20. Hubli-Dharwad
12	Kerala	21. Thiruvananthapuram
		22. Kochi
13	Maharashtra	23. Nagpur
		24. Thane
		25. Kalyan-Dombivli
		26. Aurangabad
		27. Nanded
		28. Shirdi
		29. Pune
14	Madhya Pradesh	30. Indore
		31. Gwalior
		32. Bhopal
		33. Rewa
		34. Jabalpur
15	Manipur	35. Imphal
16	Mizoram	36. Aizawl
17	Nagaland	37. Kohima
		38. Dimapur
18	Delhi	39. New Delhi (NDMC area)
19	Orissa	40. Bhubaneswar
20	Punjab	41. Amritsar
		42. Ludhiana
		43. SAS Nagar (Mohali)
21	Rajasthan	44. Ajmer
		45. Jaipur
		46. Jodhpur
22	Tamil Nadu	47. Coimbatore
23	Telangana	48. Mahbubnagar
24	Tripura	49. Agartala
25	Uttarakhand	50. Dehradun
		51. Haridwar & Rishikesh
		52. Chamoli –Gopeshwar
26	Uttar Pradesh	53. Agra
		54. Moradabad
		55. Allahabad
27	West Bengal	56. Howrah
		57. Madhyamgram
		58. New Town Kolkata
28	Jammu & Kashmir	59. Leh
29	Puducherry	60. Puducherry



**(d) State-wise details of projects approved for which funds allocated and released, during last 3 years for grid connected solar rooftops (Rs. in Crore)**

Sl. No.	State/UTs	Year 2013-14	Year 2014-15	Year 2015 -16	Total
		Released amount	Released amount	Released amount	Released amount
1	Andhra Pradesh		2.41	3.87	6.28
2	Chhattisgarh			3.60	3.60
3	Delhi			5.76	5.76
4	Gujarat	1.03		4.50	5.53
5	Goa			1.44	1.44
6	Haryana			3.60	3.60
7	Kerala			4.68	4.68
8	Madhya Pradesh			1.24	1.24
9	Odisha			2.88	2.88
10	Punjab			9.22	9.22
11	Rajasthan			4.26	4.26
12	Tamil Nadu	0.51		8.23	8.74
13	Telangana			3.08	3.08
14	Uttarakhand		0.01	22.13	22.14
15	Uttar Pradesh			5.86	5.86
16	West Bengal			3.09	3.09
17	Chandigarh	0.62	6.12	9.79	16.54
18	Manipur			0.91	0.91
	<b>Sub- Total</b>	<b>2.16</b>	<b>8.54</b>	<b>98.13</b>	<b>108.84</b>
19	PSU/Govt. Departments			18.52	18.52
20	Solar Energy Corporation of India			128	128
21	Capacity Building programme			2.73	2.73
	<b>Total</b>	<b>2.16</b>	<b>8.54</b>	<b>247.38</b>	<b>258.09</b>

**(e) State-wise details of standalone solar plants installed under  
Off-Grid programme**

<b>Power Plants</b>	
<b>State/UT</b>	<b>Stand Alone (KWp)</b>
Andhra Pradesh	3632
Arunachal Pradesh	600
Assam	1605
Bihar	1021
Chhattisgarh	22898
Delhi	698
Goa	32
Gujarat	13576
Haryana	2321
Himachal Pradesh	1512
Jammu & Kashmir	7561
Jharkhand	3539
Karnataka	4676
Kerala	3894
Madhya Pradesh	2726
Maharashtra	3857
Manipur	1241
Meghalaya	884
Mizoram	1185
Nagaland	1292
Orissa	567
Punjab	1202
Rajasthan	15540
Sikkim	795
Tamil Nadu	7297
Tripura	369
Uttar Pradesh	6263
Uttarakhand	628
West Bengal	1126
Andaman & Nicobar	167
Chandigarh	730
Dadra & Nagar Haveli	0
Daman & Diu	0
Delhi	571
Lakshadweep	1090
Puducherry	40
Telangana	1833
Others	23885
<b>Total</b>	<b>140853</b>

**ANNEXURE-III REFERRED TO IN REPLY TO PART (e) OF LOK SABHA  
STARRED QUESTION NO. 68 FOR REPLY ON 28.4.2016**

**DETAILS OF SCHEMES UNDER JNNSM**

**(I) Scheme for Development of Solar Parks and Ultra Mega Solar Power Projects.**

The scheme for development of Solar Parks and Ultra Mega Solar Power Projects has been rolled out by Ministry of New & Renewable Energy on 12-12-2014. Government has proposed to set up at least 25 Solar Parks and Ultra Mega Solar Power Projects targeting over 20,000 MW of solar power installed capacity within a span of 5 years starting from 2014-15. The capacity of the Solar Parks shall be 500 MW and above. However, smaller parks may be considered in Himalayan Region & other hilly States.

Under the scheme, the Ministry provides Central Financial Assistance (CFA) of Rs. 25 lakh per solar park for preparation of Detailed Project Report (DPR), conducting surveys, etc. Beside this, CFA of up to Rs. 20.00 lakh per MW or 30% of the project cost, including Grid-connectivity cost, whichever is lower, is also provided on achieving the milestones prescribed in the scheme.

**(II) Scheme for Development of Solar PV Power Plants on Canal Banks/ Canal Tops.**

The Government has approved the implementation of "Pilot-cum-Demonstration Project for Development of Grid Connected Solar PV Power Plants on Canal Banks and Canal Tops" on 5<sup>th</sup> December, 2014. A target of 100 MW Grid Connected Solar PV Power Plants on Canal Banks and Canal Tops (50 MW on Canal Tops and 50 MW on Canal Banks) has been set.

**Implementation Arrangements**

- 1. Eligibility:** State Power Generation Companies/ State Government Utilities/ any other State Government Organization/ PSUs/ GoI PSUs or GoI organisations. Proposals from States in Project mode will also be acceptable on completion during 2014-15 or later.
- 2. Scheme Manager:** The Scheme manager on behalf of MNRE would be Solar Energy Corporation of India (SECI) under the MNRE. SECI will handle funds to be made available under the scheme on behalf of GOI, for which they will be provided service charge of 1% of the funds handled/ routed through them.
- 3. Mode of Operation of Scheme:** The Implementing Agency will submit the application / proposal for setting up Grid-connected Solar PV Power Plants on Canal Banks/ Canal Tops to MNRE. MNRE/SECI will analyze/ scrutinize the application/ proposal and if found appropriate, MNRE will sanction the project. Thereafter, SECI shall release the capital subsidy of upto Rs. 3cr./MW for Canal Top SPV projects and Rs. 1.5cr/MW for Canal Bank SPV Projects.

**Central Financial Assistance**

- Rs.3 crore/MW or 30% of the project cost, whichever is lower, for Canal Top SPV projects and Rs. 1.5 crore/MW or 30% of the project cost, whichever is lower, for Canal Bank SPV projects.

- CFA of upto Rs.225 crore for 100 MW (50 MW on Canal Tops and 50 MW on Canal Banks) to be disbursed over a period of maximum 2 years post sanctioning of the plants as under:
  - upto 40% on sanctioning of the projects.
  - 60% on successful commissioning of the projects.
- Service charge to SECI @1%: Rs.2.25 crore.

**(III) Scheme for setting up 300 MW of Grid connected Solar PV Power Projects by Defense Establishments under Ministry of Defense and Para Military Forces with viability Gap Funding under Batch-IV of Phase-II/III of JNNSM.**

The Scheme was launched on 07<sup>th</sup> January, 2015.

**Salient Features**

- A capacity of 300 MW will be set up in various Establishments of Ministry of Defence i.e. Establishments of Army, Navy, Air Force, Ordnance Factory Board, Defence Laboratories and Defence PSUs etc. Para Military Forces would also be covered under this scheme. Minimum size of the project shall be 1 MW.
- Inter-Ministerial group has recommended NCEF Support of Rs. 750 Cr @ Rs. 2.5 Cr./MW with DCR content.
- The projects under this Scheme will mandatorily use solar cells/modules which are made in India.
- The aforesaid Establishments would identify locations for developing solar projects, anywhere in the country including border areas from time to time.
- The Defence organisations/Establishments will be free to own the power projects i.e. get a EPC contractor to build the project for them or get a developer who makes the investment and supplies power at a fixed tariff of Rs.5.50 per unit for 25 years (or Rs. 4.75 with AD). EPC has been recommended by MHA, Planning Commission and MoD)
- The MoD or the Defence Organization would be free to follow their own procurement systems or develop detailed guidelines or procedures for tendering. Tendering for inviting solar project developers to bid for developing projects, would be done by the Defence Establishments themselves. They may also lay down guidelines to cover security aspects related to working in Defence/Paramilitary Establishments. They can also take services of SECI on a turnkey basis.
- The solar project developers will be provided VGF based on the bid. The bidders will be selected on the basis of bids for minimum VGF requirement for the project with commitment to supply solar power at Rs. 5.50/KWh for 25 years. However, the upper limits of the VGF are as follows:

Category-I: Rs.2.5 Cr./MW for project capacity upto 5 MW or 30% of the project cost whichever is lower;

Category-II: Rs. 2 Cr./MW for project capacity greater than 5 MW upto 25 MW or 30% of the project cost whichever is lower; and

Category-III: Rs. 1.5 Cr./MW for project capacity greater than 25 MW or 30% of the project cost whichever is lower.

**(IV) Implementation of scheme of setting up 1000 MW of Grid-Connected Solar PV Power Projects by CPSUs with Viability Gap Funding under Batch-V of Phase-II of JNNSM.**

CPSUs and Government of India organisations participate in various Central/State Government Tenders, from time to time, for sale of solar power to State Utilities/ Discoms/ self-use/3<sup>rd</sup> party sale/merchant sale. Such CPSUs and Government of India organisations are eligible under the scheme. The Cabinet has approved the Scheme in its meeting held on 10<sup>th</sup> December, 2014. The Ministry has issued Administrative Approval on 16<sup>th</sup> January, 2015.

**Salient Features**

- i. Grid-connected solar PV power projects of 1000 MW by CPSUs and Government of India organisations.
- ii. Period of Implementation: 2014-15 to 2016-17
- iii. VGF would be provided through Solar Energy Corporation of India (SECI) at a fixed rate of Rs.1 Cr/MW for projects where domestically produced Cells and Modules are used, and Rs.50 lakh/MW would be provided in cases where domestically produced modules are used.
- iv. Alternatively, VGF can also be released directly to Domestic Manufacturers through SECI instead of releasing the VGF to CPSUs/Government of India Organizations if so, required. This will be released to the manufacturer who will be supplying cells and modules to the CPSU/Government of India Organizations for that particular power plant based on order placed by the CPSU/Government of India Organization/their EPC contractor. The release will be made after the project is commissioned and the CPSU/Government of India Organizations makes a request for release of VGF to SECI.
- v. Inter-Ministerial group has recommended NCEF Support of Rs. 1000 Cr.
- vi. The CPSUs may also sign Power Purchase Agreements (PPAs)/ Power Sale Agreements (PSAs) with State Utilities/ Discoms at tariff determined by Central Electricity Regulatory Commission (CERC) or State Regulators or may develop projects for their own use or for sale of power to a third party at mutually negotiated rates.

**(V) Implementation of Scheme for Setting up of 15000 MW of Grid connected Solar PV Power Projects under Batch II of Phase II of National Solar Mission (by NTPC/NVVN)**

The Cabinet has approved the Implementation of Scheme for setting up of 15,000 MW of Grid-connected Solar PV Power projects under National Solar Mission through NTPC/ NVVN in three tranches as follows :

<b>Tranche-I</b>	:	3,000 MW: 2014-15 to 2016-17
<b>Tranche-II</b>	:	5,000 MW: 2015-16 to 2017-18
<b>Tranche-III</b>	:	7,000 MW: 2016-17 to 2018-19

In Tranche-I, which will be Batch-II of Phase-II of National Solar Mission, 3000 MW capacity of solar PV power plants will be based on bundling of solar power (3000 MW) with unallocated thermal power (1500 MW) in the ratio of 2:1 (in MW terms), for which the required 1500 MW unallocated thermal power has been made available by the Ministry of Power.

**(VI) Setting up of 2000 MW Grid connected solar power with Viability Gap Funding through Solar Energy Corporation of India (SECI).**

The scheme envisages setting up of 2000 MW Solar PV Projects by Solar Project Developers (SPDs) on “Build, Own, Operate” basis. The Solar Projects of 2000 MW Capacity under the State Specific VGF Scheme will be set up in the Solar Parks of various states, to be developed through coordinated efforts of Central and State Agencies. As implementation of solar parks have begun recently, it could be possible that Solar Parks in some of the States do not become available soon. For such States, Solar Projects would be allowed to be located outside solar parks with land being provided either by the State Government, or arranged by the Solar Power Developers (SPDs). A Viability Gap Funding (VGF) shall be given to the selected SPDs to enable them to supply power to SECI at a pre-fixed tariff. The Project developer will be provided a viability gap funding based on his bid. The upper limit for VGF is kept at Rs.1.0 Crore/MW for open category (Rs. 1.31 Crore/MW for projects in DCR category).

Selection of the Projects will be through competitive bidding based on the VGF requirement with the provision of reduction in tariff in case of negative VGF sought by bidders. Out of total capacity of 2000 MW, a capacity of 250 MW will be earmarked for bidding with Domestic Content Requirement (DCR).

The tariff payable to the Project developer is fixed at Rs. 5.43/ kWh for the initial year and then escalated annually by Rs. 0.05/ kWh for next 20 years, resulting in the maximum allowable tariff of Rs 6.43 / kWh at the end of 21st year. The tariff would thereafter, remain fixed at Rs. 6.43/kWh. The levelized tariff for the term of the Power Purchase Agreement thus becomes Rs. 5.79/kWh.

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