

GOVERNMENT OF INDIA
MINISTRY OF NEW AND RENEWABLE ENERGY
LOK SABHA
UNSTARRED QUESTION NO. 920
TO BE ANSWERED ON 27.06.2019

SOLAR POWER SYSTEMS

920. DR. SUKANTA MAJUMDAR
SHRI KHAGEN MURMU

Will the Minister of NEW AND RENEWABLE ENERGY be pleased to state:

- (a) whether Government proposes to install solar power systems in all Government offices/buildings in the country;
- (b) if so, the details thereof along with the cost involved therein;
- (c) the details of solar power systems installed in Government offices/buildings so far, State/UT-wise including West Bengal;
- (d) whether Government has made any assessment regarding the money likely to be saved by using solar systems in Government offices/buildings and if so, the details thereof; and
- (e) the details of international collaborations/ tie-ups made for technology transfer in the field of solar power by the Government so far, country-wise and year-wise?

ANSWER

THE MINISTER OF STATE (I/C) FOR NEW & RENEWABLE ENERGY AND POWER
(SHRI R. K. SINGH)

(a) to (c) To promote grid connected solar rooftop systems on Government offices/buildings in the country, achievement linked incentives were being provided by the Ministry of New and Renewable Energy under its erstwhile Achievement Linked Incentives scheme for Government /PSU sector. Incentives up to 25% of benchmark cost in general category States/UTs and upto 60 % of benchmark cost in special category States/UTs have been provided depending upon the achievements against the sanctioned target capacity. Phase-I of the Scheme is now over and no fresh sanction is being issued.

Further, Ministry of New and Renewable Energy has also requested various Union /State Government department to install solar rooftop system in various government offices/buildings.

The details of State/UT-wise grid connected rooftop solar power systems reported as installed in Government offices/buildings/institutions etc. as on 20.06.2019 are given in **Annexure I**.

(d) On an average it is estimated that 1.5 million units per MW per year is expected to be generated from solar rooftop plants. The average cost of generation solar power from rooftop plant is around Rs.4/- per unit, and in most of the States the power tariff for Government buildings is more than this. Thus, there has been a substantial saving due to installation of rooftop solar power plants on government buildings.

(e) Ministry of New and Renewable Energy (MNRE) has signed the Memorandum of Understanding (MoUs) / Agreements with various countries / International Institutions for cooperation in the field of Renewable Energy, which inter alia includes technical cooperation also. The list of MoUs / Agreements signed between MNRE and various countries / International Institutions is placed at **Annexure II** (attached).

Annexure I to part (a),(b) and (c) of Lok Sabha unstarred question no. 920 to be answered on 27/06/2019

PCR submitted in SPIN Web Application under Government Beneficiary Category as on 20.06.2019		
S.NO.	State	Capacity (MW)
1	ANDAMAN and NICOBAR ISLANDS	1.00
2	ANDHRA PRADESH	9.09
3	ARUNACHAL PRADESH	0.00
4	ASSAM	9.31
5	BIHAR	4.89
6	CHANDIGARH	20.70
7	CHHATTISGARH	5.64
8	DADRA and NAGAR HAVELI	0.36
9	DAMAN and DIU	0.29
10	GOA	0.57
11	GUJARAT	27.22
12	HARYANA	12.59
13	HIMACHAL PRADESH	0.21
14	JAMMU and KASHMIR	4.13
15	JHARKHAND	8.07
16	KARNATAKA	6.91
17	KERALA	11.03
18	LAKSHADWEEP	0.00
19	MADHYA PRADESH	20.51
20	MAHARASHTRA	16.46
21	MANIPUR	2.02
22	MEGHALAYA	0.05
23	MIZORAM	0.40
24	NAGALAND	0.00
25	NCT OF DELHI	61.37
26	ORISSA	7.20
27	PUDUCHERRY	0.02
28	PUNJAB	8.27
29	RAJASTHAN	4.42
30	SIKKIM	0.01
31	TAMIL NADU	14.23
32	TELANGANA	8.03
33	TRIPURA	1.92
34	UTTAR PRADESH	25.82
35	UTTARAKHAND	2.58
36	WEST BENGAL	21.32
	Total	316.67

**Annexure II to part (e) of of Lok Sabha unstarred question no. 920 to be answered on
27/06/2019**

**STATUS OF IMPLEMENTATION OF
MEMORANDUM OF UNDERSTANDINGS (MoUs)/PROGRAMME/
AGREEMENTS**

SIGNED WITH FOREIGN COUNTRIES/INSTITUTES/ORGANISATIONS

Sl no	Country	Ministry/department involved	Brief objective(s)	Year of signing and location
1.	Australia	MoU between MNRE and The Department of Resources, Energy and Tourism, Government of Australia	To identify areas of mutual interest cooperation for development of new and renewable energy technologies, systems, sub systems, devices, components, etc. and monitoring and evaluating cooperation activities with the indicative scope of areas of cooperation like Solar, Hydrogen/Fuel Cells, Geo thermal, Small Hydro, Clean Energy related services and any other area as mutually agreed.	Signed On 5 th February, 2010, At New Delhi
2.	Bangladesh	MoU between MNRE and Power Division, Ministry of Power, Energy and Mineral Resources, Government of People's Republic of Bangladesh	To establish the basis for a cooperative institutional relationship to encourage and promote technical bilateral cooperation on new and renewable energy (NRE) issues on the basis of mutual benefit, equality and reciprocity.	Signed On 6 th September, 2011, At Dhaka
3.	Belarus	MoU between MNRE and The State Committee on Science and Technology of the Republic of Belarus	To develop NRE technologies and decide upon project proposal related to design and development of various NRE technologies such as but not restricted to Solar Energy, Wind Energy, Bio Energy and Small Hydro	Signed On 14 th November, 2012, At New Delhi

			Power.	
4.	Belgium	MoU between MNRE and The Competent Belgian Authorities at Federal and Regional Level for Energy	To establish the basis for cooperative institutional relationship to encourage and promote technical bilateral cooperation on new and renewable energy issues on the mutual benefit, equality and reciprocity	Signed On 29 th September, 2015, At New Delhi
5.	Brazil; South Africa	MoU between Government of India, Government of Brazil and Government of South Africa	To establish the basis for cooperation in Wind Resources	Signed On 17 th October, 2007, At Pretoria
6.	Brazil; South Africa	MoU between Government of India, Government of Brazil and Government of South Africa	To establish trilateral task team on biofuel	Signed On 13 th September 2006, At Brasilia
7.	Brazil; South Africa	MoU between Government of India, Government of Brazil and Government of South Africa	To establish the basis for cooperation in the area of solar energy	Signed On 15 th April, 2010, At Brasilia
8.	Canada	MoU between MNRE and The University of Saskatchewan, Canada	To establish the basis of cooperation in research, design and development of new and renewable energy technologies	Signed On 28 th March, 2008, At New Delhi
9.	Chile	MoU between MNRE and The National Energy Commission of the Republic of Chile	To establish the basis of cooperative institutional relationship to encourage and promote technical bilateral cooperation on new and renewable energy issues on the basis of mutual benefit, equality and reciprocity	Signed On 17 th March, 2009, At New Delhi
10.	Denmark	MoU between MNRE and The Ministry of Climate and Energy, Government of Kingdom of Denmark	To establish New and Renewable Energy Cooperation between Danish and Indian entities with aim of developing new and renewable energy technologies	Signed On 6 th February, 2008, At New Delhi
11.	Denmark	Agreement between	To cooperate in	Signed On 6 th

	k	Government of the Republic of India and Government of the Kingdom of Denmark	political field, Economic and Commercial field, science and technology, environment, energy, education and culture.	February, 2008, At New Delhi
12.	Dominican Republic	MoU between MNRE and The Ministry of Energy and Mines Government of the Dominican Republic	To establish Cooperation between the Indian and the Dominican Republic entities with the aim of developing new and renewable energy technologies in the field of Solar Energy, Wind Energy and Biomass Energy.	Signed On 17 th February, 2015, At Santo Domingo, Dominican Republic
13.	Egypt	MoU between MNRE and Ministry of Electricity and Energy of the Arab Republic of Egypt	To collaborate in efforts in the field of renewable energy pursued on the basis of equality and joint benefit as mutually agreed upon by the Parties, taking into account their expertise and their development needs	Signed On 20 th January, 2011, At Cairo
14.	Fiji	MoU between MoU between MNRE and the Ministry of Infrastructure and Transport, Fiji	MoU is to establish the basis for a cooperative institutional relationship to encourage and promote bilateral technical cooperation on new and renewable energy specially in the field of Capacity building, Solar Energy, Biomass/Bio Energy and Small Hydro Energy, on the basis of mutual benefit, equality and reciprocity between the Parties.	Signed On 24 th May, 2017, At Suva
15.	Finland	MoU between MNRE and The Ministry of Employment and the Economy of the Government of the Republic of Finland	To establish the basis for a institutional cooperation to encourage and promote bilateral cooperation on new & renewable energy	Signed On 15 th October, 2014, At Helsinki, Finland

			issues on basis of mutual benefit, equality and reciprocity	
16.	France	MoU between MNRE and The Ministry of Ecology, Sustainable Development and Energy of the French Republic	To establish the basis for a cooperative institutional relationship to encourage and promote technical bilateral cooperation on new and renewable energy issues on the basis of mutual benefit, equality and reciprocity	Signed on 10 th April, 2015, At Paris
17.	Germany	MoU between MNRE and The Federal Ministry of Economic Cooperation & Development of Federal Republic of Germany	To establish the cooperation in the field of Solar Rooftop, Development of Solar parks and Solar Zones and Solar Off grid application to improve the access to clean and sustainable energy	Signed On 5 th October, 2015, At New Delhi
18.	Germany	Implementation Agreement between MNRE and Deutsche Gesellschaft Fur Internationale Zusammenarbeit (GIZ)	Implementation Agreement concerning the project Indo-German Energy Programme-Green Energy Corridors (IGEN-GEC)	Signed on 28 th August, 2017 At New Delhi
19.	Germany	Implementation Agreement between MNRE and Deutsche Gesellschaft Fur Internationale Zusammenarbeit (GIZ)	Implementation Agreement concerning the project Indo-German Energy Programme-Access to Energy in Rural Areas (IGEN-ACCESS)	Signed on 21 st November, 2017 At New Delhi
20.	Germany	MoU between NISE and Fraunhofer Institute Fur Solare Energiesysteme (ISE)	To implement, research/ demonstration / pilot projects between NISE and ISE in solar energy	Signed On 11 th April, 2013, At Berlin
21.	Greece	MoU between MNRE and the Ministry of Environment and Energy of Hellenic Republic	To establish the basis for a cooperative institutional relationship to encourage and promote bilateral technical cooperation on new and renewable energy especially in the field of Capacity	Signed On 27 th November, 2017, At New Delhi

			Building, Solar Energy, Wind Energy, Biomass/Bio Energy and Small Hydro Energy, on the basis of mutual benefit, equality and reciprocity between the Parties.	
22.	Guyana	MoU signed between MNRE and Ministry of Public Infrastructure of Guyana	To establish Cooperation between Indian and Guyanese entities with the aim of developing New and Renewable Energy Technologies	Signed On: 30 th January, 2018 At New Delhi
23.	Iceland	MoU between MNRE and Ministry of Industry of the Republic of Iceland	To cooperate in the field of Geothermal Energy	Signed On 9 th October, 2007 At New Delhi
24.	Indonesia	MoU between MNRE and Ministry of Energy and Mineral Resources of the Republic of Indonesia	To encourage and promote bilateral technical cooperation on new and renewable energy on the basis of mutual benefit, equality and reciprocity	Signed On 2 nd November, 2015, At Jakarta
25.	Iran	MoU between MNRE and Ministry of Power of the Islamic Republic of Iran	To establish the basis for a cooperative institutional relationship to encourage and promote technical bilateral cooperation on NRE issues	Signed On 9 th July, 2010, At New Delhi
26.	Italy	MoU between MNRE and The Ministry of Environment, Land and sea of the Republic of Italy	To establish new and renewable energy cooperation between Italian and Indian entities with the Aim of Developing new and renewable energy technologies	Signed On 24 th May, 2007, At Havana
27.	Italy	MoU signed between MNRE and the Ministry of Environment of the Italian Republic	To confirm the commitment of the Parties to collaborate in the field of new and renewable energy with special attention to technologies and/or resources based on wind energy, solar	Signed On 30 th October, 2017, At New Delhi

			energy, small hydropower and biomass, innovation in the field of energy (i.e. storage) and their promotion and use.	
28.	Japan	MoU among DEA, NEDO, VIOM, MeITY, MNRE, GTL Infrastructure	To contribute to the efficient use of energy and the protection of environment in India by installing PV Power.	Signed On 6 th August, 2014, At New Delhi
29.	Japan	MoU signed between MNRE and Japan Bank for International Cooperation (JBIC)	Development of Renewable Energy Projects, Including Canal Top Solar Power projects on pan India basis, in general and in Gujarat in particular.	Signed On 1 st September, 2014, At Tokyo
30.	Malaysia	MoU between MNRE and The Ministry of Energy, Green Technology and Water of the Government of Malaysia.	To encourage and promote cooperation in renewable energy but not limited to Biomass and Biogas; Micro and Pico Hydropower, solar Energy including thermal and photovoltaic; Energy from domestic and agriculture waste; and Wind Power.	7 th November, 2012, At New Delhi
31.	Mauritius	MoU between MNRE and Ministry of Public Utilities Government of Republic of Mauritius	To Develop and promote the economic and scientific technical cooperation in the field of non conventional energy sources	Signed On 21 st November, 2003, At New Delhi
32.	Mexico	MoU between MNRE and Secretariat of Energy of the United Mexican States	To establish the basis of cooperative institutional relationship to encourage and promote technical bilateral cooperation in the field of New and Renewable Energy	Signed On 17 th April, 2008, At Mexico City
33.	Mongolia	MoU between MNRE and Ministry of Energy of the Government of Mongolia	To encourage and promote bilateral technical cooperation on new and renewable energy on the basis of mutual benefit,	Signed On 17th May, 2015, At Ulaanbaatar

			equality and reciprocity.	
34.	Mozambique	MoU between MNRE and THE REPUBLIC OF MOZAMBIQUE	To establish the basis for a cooperative institutional relationship to encourage and promote technical bilateral cooperation, investment promotion and partnership on new and renewable energy issues on the basis of mutual benefit, equality and reciprocity	Signed On 5 th August, 2015, At New Delhi
35.	Myanmar	MoU between MNRE and The Ministry of Education of the Government of the Republic of the Union of Myanmar	To encourage and promote bilateral cooperation on new and renewable energy on the basis of mutual benefit, equality and reciprocity.	Signed On 29 th August, 2016, At New Delhi
36.	The Netherlands	MoU between MNRE and Ministry of Economic Affairs, Agriculture and Innovation of The Netherlands	To establish the basis for cooperative institutional relationship to encourage and promote technical bilateral cooperation on new and renewable energy issues on the basis of mutual benefit, equality and reciprocity	Signed On 11 th February, 2014, At New Delhi
37.	Philippines	MoU between MNRE and The Department of Energy, Republic of Philippines	To establish cooperation in research, design and demonstration of renewable energy technologies; Solar Photovoltaic, Solar Heating, Biogas, Biomass, Geothermal, Small Hydro, Wind, Waste to Energy, Tidal Ocean and other Renewable Sources as identified through mutual discussions and also to undertake collective efforts for the	Signed On 5 th October, 2007, At New Delhi

			preparation and effective implementation of a “Programme for Cooperation”	
38.	Portugal	MoU between Ministry of New and Renewable Energy and The Ministry of Economy of the Portuguese Republic on Renewable Energy	To promote the establishment of the basis for a cooperative institutional relationship and to encourage programmes and activities between the signatories in the field of renewable energy.	Signed On 6 th January, 2017, At New Delhi
39.	Russia	MoU between Solar Energy Cooperation of India and Russian Energy Agency, Regarding construction of Solar power Plants in Republic of	To cooperate in good faith to realize the potential projects in of construction of large stage photovoltaic power plants (PVP) during year 2016 22. To Setup the 500 MW in the year 2016 17 (Pilot Project as per Government Scheme Norms)	Signed On 24 th December, 2015, At Moscow
40.	Rwanda	MoU between MNRE And Ministry of Infrastructure, Government of the Republic of Rwanda	To promote bilateral cooperation on new and renewable energy issues on the basis of mutual benefit, equality and reciprocity.	Signed On 15 th February, 2012, At Kigali
41.	Scotland	MoU between MNRE and The Government of Scotland	To establish New and Renewable Energy Corporation Between Ministry of New and Renewable Energy, Government of India and the Government of Scotland	Signed On 14 th October, 2009, At New Delhi
42.	Seychelles	MoU between MNRE and The Government of the Republic of Seychelles	To Strengthen, promote and develop renewable energy cooperation between two countries on the basis of equality and mutual benefit	Signed on 11 th March, 2015, At Victoria, SEYCHELLES
43.	Spain	MoU between MNRE	To confirm the	Signed On 30 th

		and Ministry of Energy, Tourism and Digital Agenda of the Kingdom of Spain	commitment of both parties to collaborate in the field of New and Renewable Energy	May, 2017, At Madrid
44.	Spain	MoU between MNRE and Centre for the Development of Industrial Technology, Spain	To establish the basis for a programme for Industrial R&D Cooperation in the field of Renewable Energy	Programme Signed On 23 rd November, 2011, At New Delhi
45.	Sweden	MoU between MNRE and Ministry of Enterprise, Energy and Communications of Sweden	Bilateral cooperation between the participants on new and renewable energy	Signed On 19 th April, 2010, At New Delhi
46.	Thailand	MoU between MNRE and The Ministry of Energy Government of Kingdom of Thailand	To Collaborate research and development in field of renewable energy specifically in the field of Photovoltaic, Solar Thermal, Biogas, Biomass, Small Hydro, Wind Energy & Other Technological Application	Signed On 26 th June, 2007, At New Delhi
47.	UAE	MoU between MNRE and Ministry of Foreign Affairs of the United Arab Emirates on Renewable Energy Corporation	To collaborate in efforts to establish the basis for a framework through which extensive projects, investments, other forms of commercial endeavors, cooperation in R&D in Renewable and Clean Energy and knowledge Sharing platforms.	Signed On 11 th February, 2016, At New Delhi
48.	UAE	MoU between MNRE and Ministry of foreign affairs, DECC of the UAE	To establish the basis for Institutional relationship to encourage and promote RE cooperation	Signed On 18 th January, 2014, At Abu Dhabi
49.	United Kingdom	MoU between Government of India and Government of United Kingdom of Great Britain and Northern Ireland	Establish a framework for strategic cooperation covering technical, policy, research and commercial aspects of development of energy sector	Signed On 11 th November, 2015, At London
50.	Uruguay	MoU between MNRE	To establish the basis	Signed On 25 th

		and the Government of Uruguay	for a cooperative institutional relationship to encourage and promote bilateral cooperation on NRE issues	February, 2011, At New Delhi
51.	USA	MoU between MNRE and USA	To foster cooperation between India and USA in the area of renewable energy to Facilitate a new track known as “Promoting Energy Access through Clean Energy” (PEACE)	Signed On 27 th September, 2013, At Washington, USA And 29 th January, 2014, At New Delhi
52.	USA	MOU between MNRE and The Department of Energy, USA on Cooperation in the field of Biofuel.	To encourage a framework of cooperation covering scientific, policy, technical aspects of production conversion, utilization, distribution and marketing of biofuels in sustainable and environment friendly manner in accordance with national priorities and socio economic development strategic and goals.	Signed On 3 rd February, 2009 At New Delhi
53.	USA	MoU between MNRE and USA	To establish a fund to support the Promoting Energy Access Through Clean Energy (PEACE) track of the US India partnership to advance clean energy (PACE)	Signed On 30 th June, 2015
54.	USA	MoU between NISE and NREL	To establish the basis for Collaboration on Solar Energy Research and development	Signed On: 23 rd November, 2009 At Golden Colorado
55.	USA	MoU between NIWE and NREL	To establish the basis for Cooperation in the Area of Wind Energy	Signed On 23 rd November, 2009, At Golden Colorado
56.	Morocco	MoU between MNRE and Ministry of Energy, Mines and Sustainable Development of the Kingdom of Morocco	To establish the basis for a cooperative institutional relationship to encourage and promote bilateral	Signed on 10 th April, 2018

			technical cooperation on new and renewable energy especially in the field of Capacity Building, Solar Energy, Biomass/Bio-Energy and Small Hydro Energy	
57.	France	National Institute of Solar Energy (NISE) and Commissariat a l'Energie Atomique et aux Energies Alternatives (CEA), the National Solar Energy Institute (INES), France	To identify research/demonstration/ pilot project between NISE and CEA in the mutually identified areas	Signed on 10 th March, 2018
58.	Peru	MNRE and the Ministry of Energy and Mining of the Republic of Peru	To establish the basis for a cooperative institutional relationship to encourage and promote bilateral technical cooperation in new and renewable energy	Signed on 11 th May, 2018
59.	Bahrain	Ministry of New and Renewable Energy of the Republic of India and the Ministry of Electricity and Water Authority of the Kingdom of Bahrain	To establish the basis for a cooperative institutional relationship to encourage and promote bilateral technical cooperation on new and renewable energy on the basis of mutual benefit, equality and reciprocity between the Parties. The cooperation will focus on Solar Energy, Small Hydro, Wind Energy, Biomass/ Bio-energy and Capacity building as the areas for development of new and renewable energy technologies	Signed on 15 th July 2018
60.	France	Memorandum of Understanding (MoU) between the Solar Energy Corporation of India Limited Government of the Republic of India and The Agence Francaise De Developpement, French Public entity governed by French Law.	The objective of the Memorandum of Understanding (MoU) is to establish the basis for a cooperative institutional relationship to encourage and promote bilateral technical cooperation on new and renewable energy on the basis of mutual benefit,	Signed on 03 rd October, 2018

			<p>equality and reciprocity between the Parties. The cooperation will focus in the domain of renewable energies, and solar energy technologies in particular. The areas of technical cooperation will include energy storage, integrated renewable energy network managements in islands or isolated areas, solar energy powered charging infrastructure for e-vehicles, floating solar technology, rooftop solar system, manufacturing of solar cells in India and integration of farming with solar power plant.</p>	
61.	France	<p>Memorandum of Understanding (MoU) between the Solar Energy Corporation of India Limited (SECI), a Central Public Sector Undertaking of Government of the Republic of India; Commissariat à l'Énergie Atomique Et Aux Energies Alternatives (CEA), French state-owned research entity and BlueStorage SAS, a French Company</p>	<p>The objective of the Memorandum of Understanding (MoU) is to define the modalities of discussions concerning, in particular, the future collaboration in a pilot project to provide SECI an e-vehicle charging station with embedded batteries, powered by solar panels and optimized connection to the grid in order to support the Government's ambitious plan for the deployment of electrical vehicles by maximizing solar mobility and minimizing its grid impact.</p>	<p>Signed on 03rd October, 2018</p>
62.	Tajikistan	<p>Memorandum of Understanding (MoU) between the Ministry of New and Renewable Energy of the Government of the Republic of India and the Ministry of Energy and Water Resources of the Government of the</p>	<p>The objective of the Memorandum of Understanding (MoU) is to establish the basis for a cooperative institutional relationship to encourage and promote bilateral technical cooperation on new and renewable</p>	<p>Signed on 08th October, 2018</p>

		Republic of Tajikistan	energy on the basis of mutual benefit, equality and reciprocity between the Parties. The cooperation will focus on development & deployment of new and renewable energy and storage technologies.	
63.	Denmark	Memorandum of Understanding (MoU) between Ministry of New and Renewable Energy and Denmark Technical University	The objective of the Memorandum of Understanding (MoU) is to establish the basis for a cooperative institutional relationship to encourage and promote research and technical cooperation in the areas identified for collaboration on the basis of mutual benefit, equality and reciprocity between the Parties.	Signed on 17 th December, 2018
64.	Denmark	Cooperation Agreement between Ministry of New and Renewable Energy of the Republic of India and Ministry for Energy, Utilities and Climate of the Kingdom of Denmark on Strategic Sector Cooperation in the field of Renewable Energy with a focus on Offshore Wind Energy and Letter of Intent (LoI) to establish an Indo-Danish Centre of Excellence for Integrated Renewable Power in India	<p>The objectives of the cooperation agreement are as follows:</p> <ul style="list-style-type: none"> • Technical capacity building for management of off-shore wind project • Measures to develop and sustain a highly efficient wind industry, onshore as well as offshore • Measures to ensure high quality of wind turbines, components, and certification requirements • Forecasting and scheduling of off-shore wind • Any other area as may be mutually agreed upon <p>The objective of the Letter of Intent is to document the intent of India and Denmark to establish a Centre of Excellence for Integrated Renewable Power in India</p>	Signed on 6 th March 2019

