

GOVERNMENT OF INDIA
MINISTRY OF NEW AND RENEWABLE ENERGY
LOK SABHA
UNSTARRED QUESTION NO. 832

TO BE ANSWERED ON 21.11. 2019

INSTALLATION OF SOLAR PLANTS

832. SHRI BHAGWANTH KHUBA:
SHRI VINOD KUMAR SONKAR:
SHRI BHOLA SINGH:
DR. SUKANTA MAJUMDAR:
SHRI RAJA AMARESHWARA NAIK:

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

- (a) whether the Government proposes to install adequate number of solar plants to meet all energy demands of Union Territory of Ladakh completely through renewable energy sources;
- (b) if so, the details thereof;
- (c) whether the Government also proposes to achieve the target of 175 GW of renewable energy generation by 2022;
- (d) if so, the details thereof along with the cost involved therein; 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 and year-wise?

ANSWER

THE MINISTER OF STATE (I/C) FOR NEW & RENEWABLE ENERGY, POWER and MoS
for SKILL DEVELOPMENT AND ENTREPRENEURSHIP

(SHRI R. K. SINGH)

- (a) and (b) The Ministry of New and Renewable Energy has planned to set up solar power projects with cumulative capacity of around 14 MW with battery storage capacity of 42 MWh in Leh and Kargil under Prime Minister Development Package (PMDP)-2015 for Jammu and Kashmir.
- c) and (d) The Government has set a target of installation of 175 GW of grid connected renewable power capacity by 2022. Of this, 100 GW will come from solar, 60 GW from wind, 5 GW from Small Hydro and 10 GW from Bio-energy. The Ministry of New and Renewable Energy has launched various schemes for achieving the target. Most of the projects in RE sector are implemented through private investment. Assuming average investment costs of Rs.4,000, 6000, 10000, and 7000 Crore per GW for Solar, Wind, Small Hydro and Bio-energy projects respectively, an investment of Rs. 8,80,000 crore is involved for setting up of 175 GW capacity in the Country.
- (e) The country and year-wise details of Memorandums of Understanding (MoU)/Agreements signed with other countries are given in **Annexure**. These MoUs/Agreements have overarching framework for cooperation in Renewable Energy sector including technical cooperation.

ANNEXURE**ANNEXURE REFERRED TO IN REPLY TO PART (E) OF LOK SABHA UNSTARRED QUESTION NO. 832 FOR 21.11.2019 REGARDING INSTALLATION OF SOLAR PLANTS****DETAILS OF MEMORANDUM OF UNDERSTANDINGS (MoUs)/PROGRAMME/ AGREEMENTSIGNED 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, Geothermal, 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	Signed On 6 th September, 2011, At Dhaka

			renewable energy (NRE) issues on the basis of mutual benefit, equality and reciprocity.	
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 Power.	Signed On 14 th November, 2012, At New Delhi
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	To establish the basis for cooperation in the area of solar	Signed On 15 th April, 2010, At Brasilia

		South Africa	energy	
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 Government of the Republic of India and Government of the Kingdom of Denmark	To cooperate in political field, Economic and Commercial field, science and technology, environment, energy, education and culture.	Signed On 6 th 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	Signed On 17 th February, 2015, At Santo Domingo, Dominican

			with the aim of developing new and renewable energy technologies in the field of Solar Energy, Wind Energy and Biomass Energy.	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	To establish the basis for a institutional	Signed On 15 th October, 2014, At Helsinki,

		Economy of the Government of the Republic of Finland	cooperation to encourage and promote bilateral cooperation on new & renewable energy issues on basis of mutual benefit, equality and reciprocity	Finland
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- Access to Energy in Rural Areas (IGEN-ACCESS)	Signed on 19 th February, 2016 At New Delhi
19.	Germany	Implementation Agreement between MNRE and Deutsche Gesellschaft Fur	Implementation Agreement concerning the project Integration	Signed on 19 th February, 2016 At New Delhi

		Internationale Zusammenarbeit (GIZ)	of Renewable Energies in the Indian Electricity System (I-RE)	
20.	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
21.	Germany	Implementation Agreement between MNRE and Deutsche Gesellschaft Fur Internationale Zusammenarbeit (GIZ)	Implementation Agreement concerning the project Indo-German Solar Energy Partnership– PV Rooftop (IGSP-PVRT 2”	Signed on 03 rd August, 2018 At New Delhi
22.	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 II)	Signed on 01 st November, 2019 At New Delhi
23.	Germany	Implementation Agreement between MNRE and Deutsche Gesellschaft Fur Internationale Zusammenarbeit (GIZ)	Implementation Agreement concerning the project – Promotion of Solar Water Pumps (PSWP).	Signed on 01 st November, 2019 At New Delhi
24.	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 Building, Solar Energy, Wind Energy,	Signed On 27 th November, 2017, At New Delhi

			Biomass/Bio Energy and Small Hydro Energy, on the basis of mutual benefit, equality and reciprocity between the Parties.	
25.	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
26.	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
27.	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
28.	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
29.	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	Signed On 24 th May, 2007, At Havana

			Developing new and renewable energy technologies	
30.	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 energy, small hydropower and biomass, innovation in the field of energy (i.e. storage) and their promotion and use.	Signed On 30 th October, 2017, At New Delhi
31.	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
32.	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
33.	Malaysia	MoU between MNRE and The Ministry of Energy, Green Technology and Water of the Government of	To encourage and promote cooperation in renewable energy but not limited to Biomass and	7 th November, 2012, At New Delhi

		Malaysia.	Biogas; Micro and Pico Hydropower, solar Energy including thermal and photovoltaic; Energy from domestic and agriculture waste; and Wind Power.	
34.	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
35.	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
36.	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, equality and reciprocity.	Signed On 17 th May, 2015, At Ulaanbaatar
37.	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	Signed On 5 th August, 2015, At New Delhi

			promotion and partnership on new and renewable energy issues on the basis of mutual benefit, equality and reciprocity	
38.	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
39.	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
40.	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, Geo thermal, Small Hydro, Wind, Waste to Energy, Tidal Ocean and other Renewable	Signed On 5 th October, 2007, At New Delhi

			Sources as identified through mutual discussions and also to undertake collective efforts for the preparation and effective implementation of a “Programme for Cooperation”	
41.	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
42.	Russia	MoU between Solar Energy Cooperation of India and Russian Energy Agency, Regarding construction of Solar power Plants in Republic of India.	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
43.	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	Signed On 15 th February, 2012, At Kigali

			benefit, equality and reciprocity.	
44.	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
45.	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
46.	Spain	MoU between MNRE and Ministry of Energy, Tourism and Digital Agenda of the Kingdom of Spain	To confirm the commitment of both parties to collaborate in the field of New and Renewable Energy	Signed On 30 th May, 2017, At Madrid
47.	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
48.	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

49.	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
50.	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
51.	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
52.	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
53.	Uruguay	MoU between MNRE and the Government of Uruguay	To establish the basis for a cooperative	Signed On 25 th February, 2011, At New Delhi

			institutional relationship to encourage and promote bilateral cooperation on NRE issues	
54.	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
55.	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
56.	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	Signed On 30 th June, 2015

			energy (PACE)	
57.	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
58.	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
59.	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 technical cooperation on new and renewable energy especially in the field of Capacity Building, Solar Energy, Biomass/Bio-Energy and Small Hydro Energy	Signed on 10 th April, 2018
60.	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
61.	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	Signed on 11 th May, 2018

			renewable energy	
62.	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 15th July 2018
63.	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, equality and reciprocity between the Parties. The cooperation will focus in the domain of renewable	Signed on 03 rd October, 2018

			<p>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>	
64.	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 á l'Énergie Atomique Et Aux Energies Alternatives (CEA), French state-owned research entity and Blue Storage 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>
65.	Tajikistan	Memorandum of	The objective of	Signed on 08 th

		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 Republic of Tajikistan	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, equality and reciprocity between the Parties. The cooperation will focus on development & deployment of new and renewable energy and storage technologies.	October, 2018
66.	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
67.	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	The objectives of the cooperation agreement are as follows: • Technical capacity building for management of off-shore wind project	Signed on 6 th March 2019

		<p>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>	<ul style="list-style-type: none"> • 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>	
68.	Guinea	MoU between MNRE and of the Ministry of Energy of the Republic of Guinea	<p>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.</p>	signed on 20 th September 2019 at Guinea
