



PRESS INFORMATION BUREAU
(Research Unit)
Ministry of Information and Broadcasting
Government of India



Budget Series #11

Union Budget 2022-2023: India Embarks on a Solar Journey

₹19,500 crore allocated to achieve the goal of 280GW of installed solar capacity by 2030

Production linked incentives for manufacturing of high efficiency modules

India's solar energy capacity up from 2.63 GW to 49 GW in last 7 years

India pushes for One Sun, One World, One Grid (OSOWOG)

(Ministry of New and Renewable Energy)

March 03, 2022

“Solar energy is going to be a major source of energy needs not only today but in the 21st century, because solar energy is Sure, Pure and Secure.”

-Prime Minister Narendra Modi¹

The Union Budget 2022-23 has provided a budgetary allocation of **₹3365 crore** for the solar power sector, including both grid-interactive and off-grid projects. This is a **29 per cent increase** over the previous year budget of **₹2606 crore²**.

The budget has given a major push to the solar energy sector under renewable energy with an additional allocation of **₹19,500 crore for production linked incentives for manufacturing of high efficiency solar photo voltaic modules**.

The budget ensures the domestic manufacturing required for achieving the ambitious goal of **280 GW of installed solar capacity by 2030**.

The budget also provides for **Sovereign Green Bonds** to be issued for mobilizing resources for green infrastructure³.

¹<https://www.pib.gov.in/PressReleasePage.aspx?PRID=1637693>

²<https://www.indiabudget.gov.in/doc/eb/sbe71.pdf>

³<https://pib.gov.in/PressReleasePage.aspx?PRID=1794473>

Background: Solar Energy

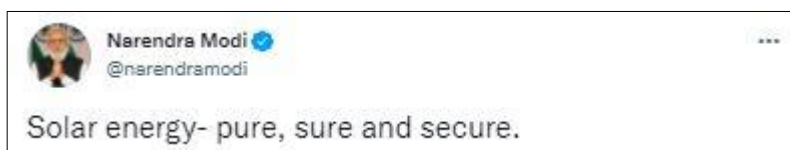
Overview⁴

India is endowed with vast solar energy potential. **About 5,000 trillion kWh per year energy is incident over India's land area with most parts receiving 4-7 kWh per sq. m per day.**

Solar photovoltaic power can effectively be harnessed providing huge scalability in India. Solar also provides the ability to generate power on a distributed basis and enables rapid capacity addition with short lead times.

From an energy security perspective, solar is the most secure of all sources due to its abundantly available. Theoretically, a small fraction of the total incident solar energy, if captured effectively can meet the entire country's power requirements.

Solar energy sector in India supports the government agenda of sustainable growth while emerging as an integral part of the solution to meet the nation's energy needs and an essential player for energy security.



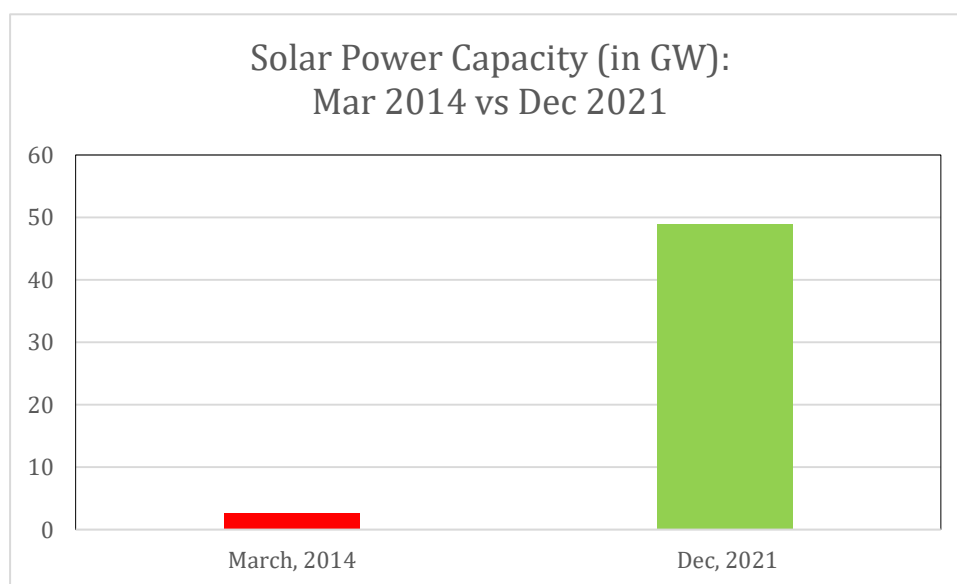
The National Institute of Solar Energy has assessed the country's solar potential of about 748 GW assuming 3 per cent of the waste land area to be covered by Solar PV modules. Solar energy has taken a central place in India's National Action Plan on Climate Change with National Solar Mission as one of the key missions.

The Mission targets installing 100 GW grid-connected solar power plants by the year 2022. This is line with India's Intended Nationally Determined Contributions (INDCs) target to achieve about 40 per cent cumulative electric power installed capacity from non-fossil fuel based energy resources and to reduce the emission intensity of its GDP by 33 to 35 per cent from 2005 level by 2030.

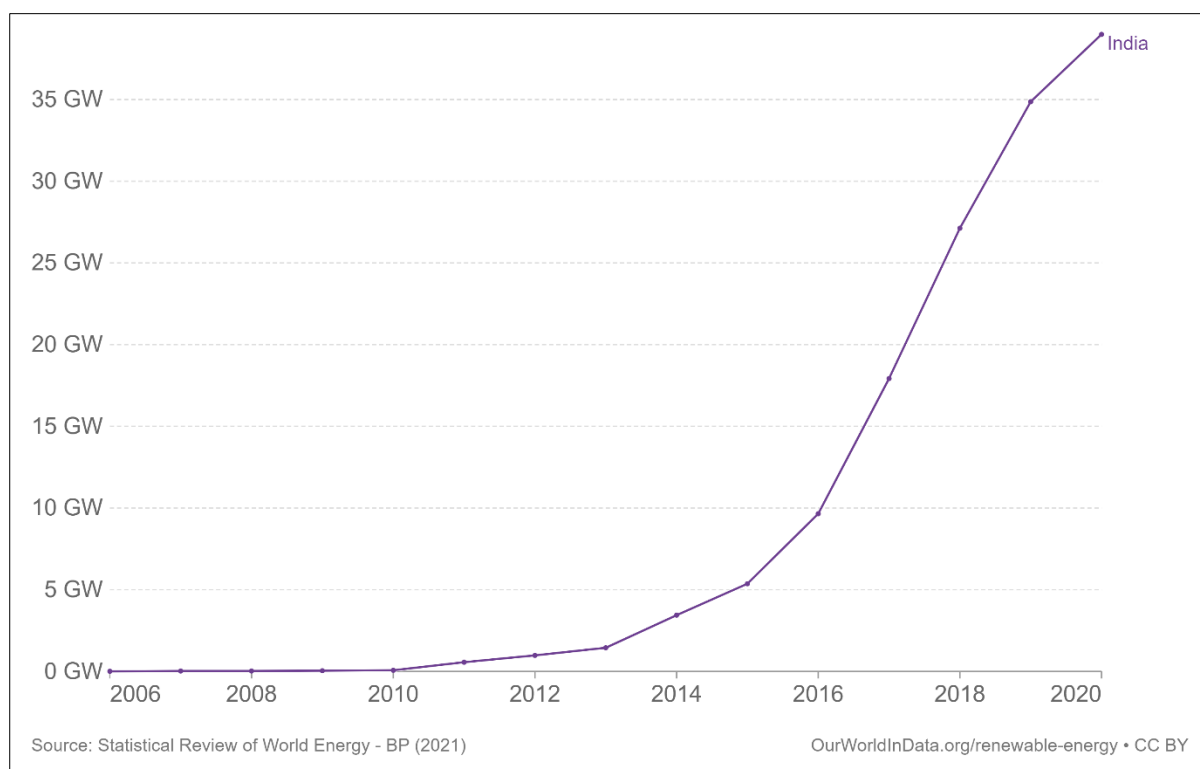
⁴<https://mnre.gov.in/solar/current-status/>

⁵<https://twitter.com/narendramodi/status/1281504200241762306>

Installed capacity of solar energy in India has increased from 2.63 GW in March 2014 to 49 GW in December 2021⁶



Installed Solar Energy Capacity in India: 2006-2020⁷



⁶<https://www.investindia.gov.in/team-india-blogs/budget-2022-state-solar-energy-sector>

⁷<https://ourworldindata.org/grapher/installed-solar-pv-capacity?time=2006..latest&country=~IND>

Policy Support from the Government⁸

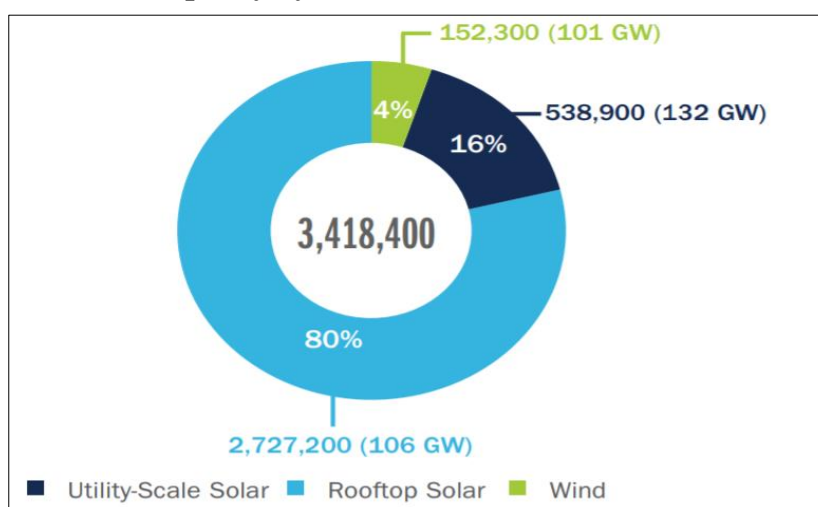
India's solar module manufacturing capacity is set to increase by four times in 2025 as compared to 2021, with 30-35 GW of fresh module capacity set to be commissioned following strong demand, favourable policies, likely improvement in energy efficiency, and price competitiveness.

- The imposition of basic customs duty (BCD) on imported solar cells (25%)/ modules (40%) is to promote domestic manufacturing by making the domestic cells/modules competitive.
- Government has also announced dedicated corridors to evacuate renewable power through Phase-2 of the Green Energy Corridor (20 GW).
- The scheme will facilitate grid integration and power evacuation of approximately 20 GW of Renewable Energy (RE) power projects in seven States namely, Gujarat, Himachal Pradesh, Karnataka, Kerala, Rajasthan, Tamil Nadu and Uttar Pradesh⁹.

Employment Generation

India can potentially create about 3.4 million jobs (short and long term) by installing 238 GW solar and 101 GW new wind capacity to achieve the 500 GW non-fossil electricity generation capacity by 2030. These jobs represent those created in the wind and on-grid solar energy sectors. A workforce of about one million can be employed to take up these green jobs¹⁰.

Sector-wise jobs creation potential by achieving 101 GW wind and 238 GW solar targets of non-fossil fuel capacity by 2030¹¹ :



⁸<https://www.investindia.gov.in/team-india-blogs/budget-2022-state-solar-energy-sector>

⁹<https://pib.gov.in/PressReleaseframePage.aspx?PRID=1788011>

¹⁰<https://www.investindia.gov.in/team-india-blogs/budget-2022-state-solar-energy-sector>

¹¹<https://www.ceew.in/publications/indias-expanding-clean-energy-workforce>

Major initiatives for SOLAR Energy Sector in the Budget: Transition to Carbon Neutral Economy¹²

- As a part of the government's overall market borrowings in 2022-23, **sovereign Green Bonds** will be issued for mobilizing resources for green infrastructure. The proceeds will be deployed in public sector projects.



- The Budget has proposed an additional allocation of

₹19,500crores for Production Linked Incentive for manufacture of high efficiency modules. This will also ensure the domestic manufacturing required for achieving the ambitious goal of 280 GW of installed solar capacity by 2030.



- This strategy opens up huge employment opportunities and the budget proposes several near-term and long-term actions in this regard.

¹²<https://www.pib.gov.in/PressReleasePage.aspx?PRID=1794470>

Major Ongoing Schemes¹³

- **Pradhan Mantri Kisan Urja Suraksha Evam Utthan Mahabhiyan (PM KUSUM)**

PM-KUSUM scheme is one of the largest initiatives in the world to provide clean energy to more than 3.5 million farmers by solarising their agriculture pumps. PM-KUSUM scheme aims to support installation of additional solar capacity of 30.80 GW.

- **Roof Top Solar (RTS) Program**

Rooftop Phase-I of RTS program was launched on 30th December, 2015 in which incentives and subsidies were provided for residential, institutional and social sectors. Achievement linked incentives were also provided for government sector. Rooftop Phase-II was launched in February 2019 with a target of achieving cumulative capacity of 40,000 MW by the year 2022.

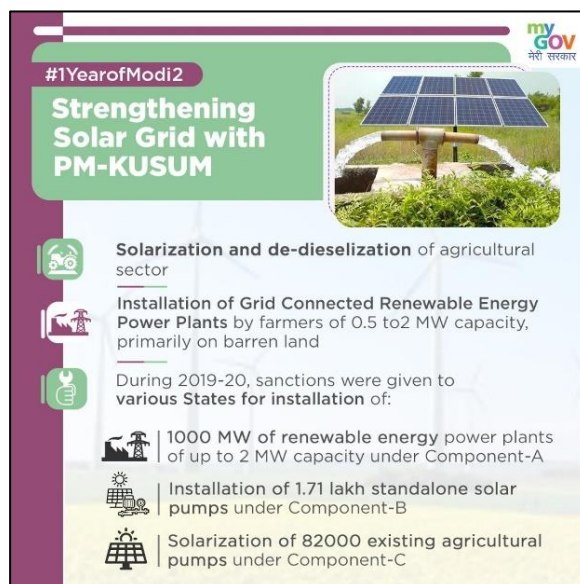
- **Solar Parks**

The scheme for development of solar parks has a target capacity of 40 GW. All States and Union Territories are eligible for getting benefits under the scheme. Solar parks are being developed by agencies of Central/State Governments, Joint Ventures between agencies of the Central and the state governments and also by private entrepreneurs.

- **Green Energy Corridors**

The Inter-State Transmission System (ISTS) component consisting of 3200 km transmission lines and 17,000 MVA substations has been completed in March 2020. The Intra-State Transmission System (InSTS) component has been sanctioned to eight RE rich states of Tamil Nadu, Rajasthan, Karnataka,

Andhra Pradesh, Maharashtra, Gujarat, Himachal Pradesh and Madhya Pradesh for evacuation of over 20,000 MW of renewable power.



Infographic Source: MyGov



#Cabinet approves Intra-State Transmission System – Green Energy Corridor Phase-II

Around 12,000 crores will be spent on the scheme and 10,750 circuit kilometers of the transmission line to be constructed approximately: Union Minister

@ianuragthakur

Cabinet Decision dated 6 Jan 2022

¹³ https://mnre.gov.in/img/documents/uploads/file_f-1618564141288.pdf

- **Greening of Islands**

The Government intends to fully convert Andaman and Nicobar, Lakshadweep islands to Green Energy where energy needs will be met using RE sources. The Greening of Islands program aims to deploy 52 MW of distributed grid-connected solar PV power projects.

- **Solar Cities**

At least one city (either the state capital city or a well-known tourist destination) in each of the states of India is being developed as a solar city. All electricity needs of the city will be fully met from RE sources, primarily from solar energy.

- **Waiver of Inter State Transmission System Charges**

Inter State Transmission System charges and losses for inter-state sale of power from solar and wind power projects have been waived for all projects to be commissioned up to June 30, 2023.

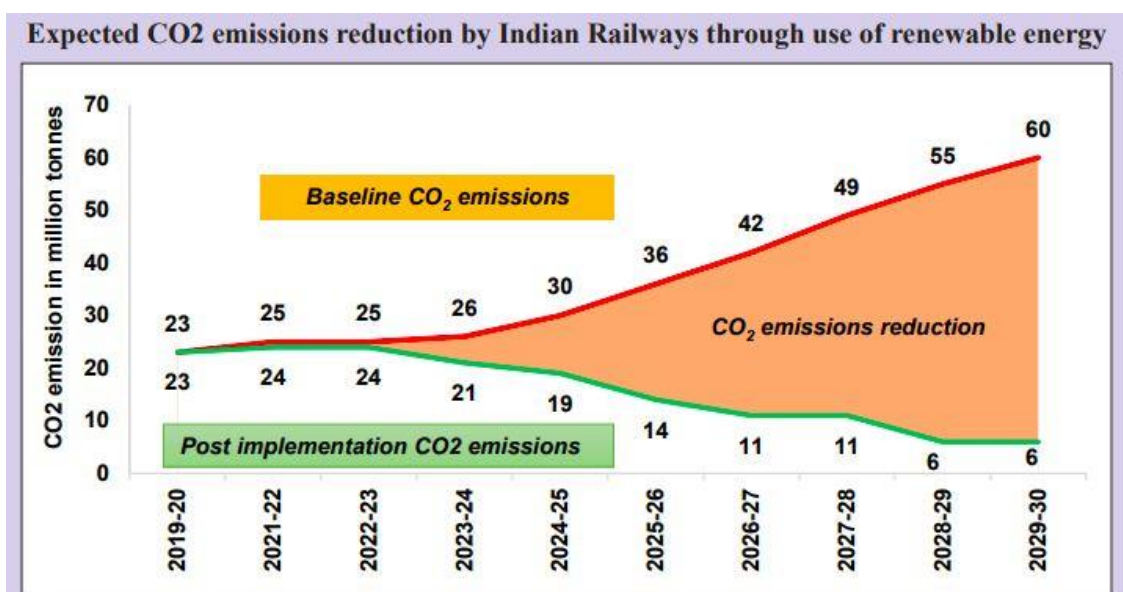
Major Initiatives and Achievements¹⁴

- India has launched the Pradhan Mantri Kisan Urja Suraksha evam Utthaan Mahabhiyan (PM-KUSUM) Scheme to provide energy and water security, de-dieselize the farm sector and generate additional income for farmers by producing solar power. The scheme aims to add 30.8 GW of solar capacity with central financial support of over **₹34,000 crore**.
- As of 31st December, 2021 over 77,000 standalone solar pumps, 25.25 MW capacity solar power plants and over 1026 pumps were solarised under individual pump solarisation variant.
- To facilitate large scale grid connected solar power projects, a scheme for “Development of Solar Parks and Ultra Mega Solar Power Projects” is under implementation with a target capacity of 40 GW capacity by March 2024.
- So far, 50 solar parks have been sanctioned with a combined capacity of 33.82 GW in 14 states. Solar power projects of an aggregate capacity of around 9.2 GW have already been commissioned in these parks.
- Roof Top Solar programme Phase-II for accelerated deployment of solar roof top systems, with a target of 40 GW installed capacity by December 2022, is also under implementation. The scheme provides for financial assistance for up to 4 GW of solar roof top capacity to residential sector and there is a provision to incentivise the

¹⁴<https://www.indiabudget.gov.in/economicsurvey/doc/echapter.pdf>

distribution companies for incremental achievement over the previous year. So far, a cumulative 5.87 GW solar roof top projects have been set up in the country.

- A scheme for setting up 12 GW Grid-Connected Solar PV Power Projects by government entities (including Central Public Sector Undertakings) is under implementation. Government has so far sanctioned around 8.2 GW of projects.
- Till December 2021 over 1.45 lakh solar street lights were installed, 9.14 lakh solar study lamps were distributed and about 2.5 MW solar power packs were set-up as reported by State Nodal agencies.
- As of 31st December 2021, capacity of around 4.25 GW of wind-solar hybrid have been awarded, out of which 0.2 GW is already commissioned and additional capacity of 1.2 GW wind-solar hybrid projects are at various stages of bidding.
- Indian Railways has set a target of Net Zero Carbon Emission by 2030, primarily through sourcing its energy requirements through renewable energy sources. By December 2023, the Railways is aiming for 100 per cent electrification of its network.



India and the World: One Sun One World One Grid¹⁵

Prime Minister Narendra Modi conceptualised “One Sun, One World, One Grid” for interconnected solar energy infrastructure at a global scale. Taking this vision forward, the United Kingdom and the Government of India, International Solar Alliance with the support of the World Bank, jointly launched the global “**Green Grids Initiative – One Sun One World One Grid**”, at COP26. This will include a political declaration at the World Leaders’

¹⁵<https://isolaralliance.org/work/osowog/>

Summit and increased technical, financial and research cooperation to help deliver India's vision of 'One Sun, One World, One Grid'.

Aim

To help ensure that clean, efficient power is the most economical, accessible, and reliable option for all countries to meet their power needs by 2030.

Goal

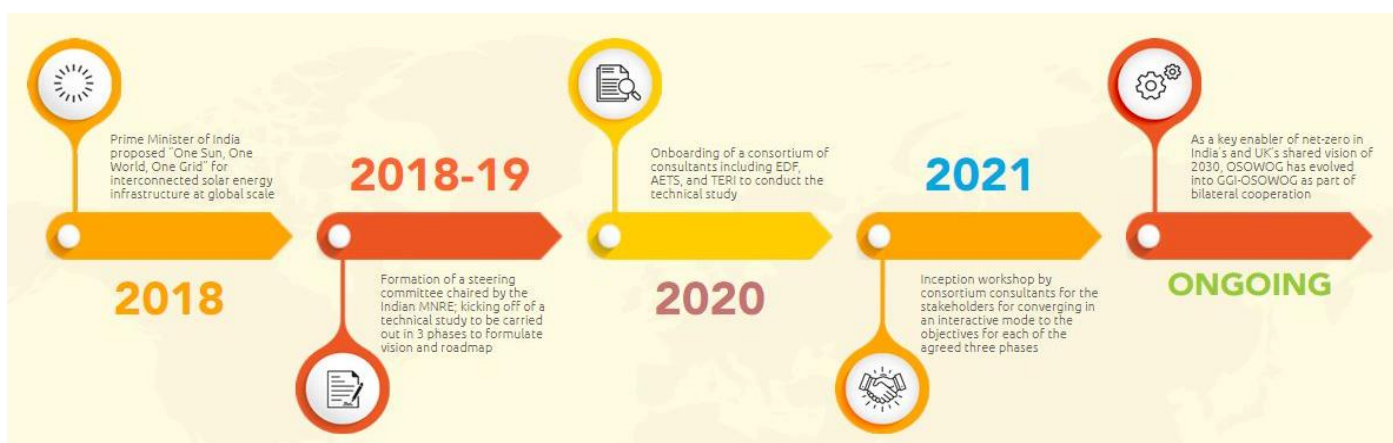
To build a framework for a global cooperation initiative targeted at effective utilisation of renewable sources across the globe and accelerate the mobilisation of technical and financial resources needed to advance action on green grids. The solar grid will connect across countries and merge wind farms, community grids and large-scale solar power plants to ensure an affordable, clean energy supply for everyone.

Framework

Green Grid Initiative – One Sun One World One Grid aims to achieve global grid interconnection through three key pillars:

- **Political engagement** and trust building between countries spearheaded by an intergovernmental steering group including representatives from each region – Asia, Africa, Europe, North America, Latin America and India.
- **Institutional engagement** among international financial and technical institutions spearheaded by a joint coordination committee that includes the ISA and other partners such as the World Bank.
- **Research and knowledge sharing** through the Green Powered Future mission, a newly launched international innovation program with peer-to-peer learning.

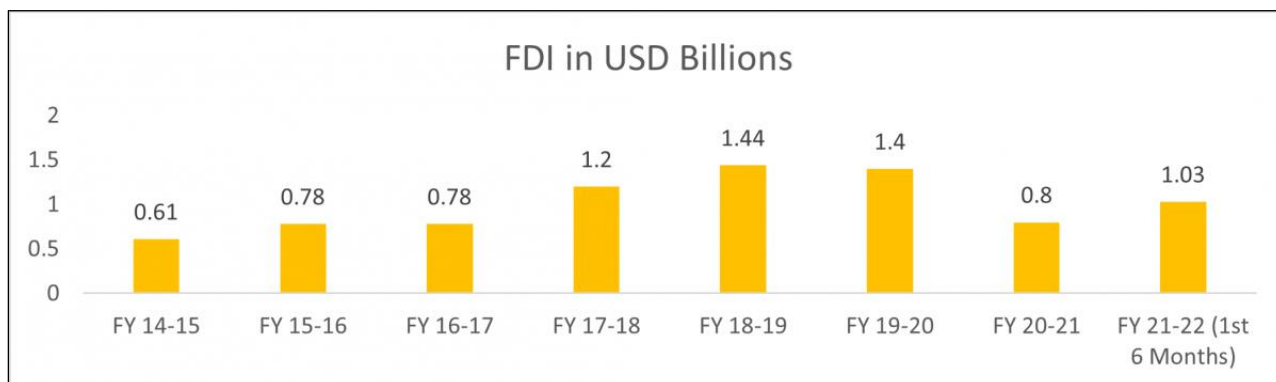
Timeline¹⁶ of OSOWOG



¹⁶ <https://isolaralliance.org/work/osowog/>

Foreign Direct Investment in the Renewable Sector¹⁷

- The renewable energy targets set by governments have helped the investors to make an informed choice and give them policy stability assurance for the future.
- **The sector has received a cumulative FDI of \$ 8 billion since 2014 till September 2021.**
- India is on track to achieve FDI of USD 1.5 billion in the current fiscal year.



International Solar Alliance¹⁸

International Solar Alliance will be the First International and Inter-Governmental Organisation of 121 Countries to have Headquarters in India with United Nations as Strategic Partner



ISA has attained a Permanent Observer Status at the UN General Assembly. It has signed a Memorandum of Understanding with United Nations Framework Convention on Climate Change (UNFCCC) at COP 26 to support ISA membership in developing a roadmap for, and implementing, their respective NDCs under the Paris Agreement.

ISA is mandated to facilitate mobilization of USD 1 trillion in solar investments by 2030 for massive scale-up of solar energy deployment.

The Strategic Plan of the ISA for 2021-2026 identifies three key global issues – Energy Access, Energy Security, and Energy Transition. ISA has launched eight thematic programs to address the above issues and an overarching program to facilitate mobilization of affordable finance for large-scale deployment of solar energy across ISA membership.

¹⁷ <https://www.investindia.gov.in/team-india-blogs/budget-2022-state-solar-energy-sector>

¹⁸ <https://www.indiabudget.gov.in/economicsurvey/doc/eschapter/echap06.pdf>

Solar projects under Government of India's Line of Credit¹⁹

S. No	Country	Good to be covered	Amount(US\$)	Date of Approval	Status
1	Mauritius	Design, supply, installation, testing and commissioning of an 8 MW ac solar PV Farm at Henrietta (Phase-II) Mauritius.	10,000,000	25-05-17	Under implementation
2	Mozambique	Turnkey project for setting up of Solar PV modules manufacturing plant of 5 MW per year capacity on turnkey Basis in Mozambique.	12,995,000	08-05-12	Completed
3	Niger	Project Management Consultancy for construction of solar thermal plant of 5 MW in Malbaza and electrification of 30 villages through solar system in Niger.	1,899,700	27-03-15	Under implementation
4	Niger	Design, engineering, procurement & supply, erection, testing and commissioning of electrification works of 50 villages by Crystalline Solar PV system (micro power plant and individual stand-alone solar kits).	9,273,000	02-11-16	Under implementation
5	Niger	Design, engineering, procurement & supply, erection, testing and commissioning of Solar PV 7 MW power plant in Malbaza, Niger.	15,670,000	02-11-16	Under implementation
6	Niger (through EBID LOC)	Solar electrification of 50 villages in Niger.	10,000,000	NA	Under implementation
7	Nigeria	Solar mini grid electrification and solar street lighting project in the state of Kaduna, Nigeria.	27,590,025	29-06-17	Under implementation
8	Sierra Leone (through EBID LOC)	Supply and installation of solar street lighting.	20,000,000	10-07-12	Completed
9	Sudan	Solar PV module manufacturing plant.	576,900	29-06-04	Completed
10	Sudan	Supply of equipment for solar electrification.	5,000,000	25-04-07	Completed
11	Sudan	Solar PV Modules.	1,000,000	10-07-07	Completed
12	Suriname	High frequency communication equipment, solar lanterns.	1,500,000	24-03-05	Completed
13	Senegal	Supply, transportation and installation of equipment for electrical network in different regions of Senegal.	27,499,970	13-12-16	Under implementation

¹⁹ <https://www.mea.gov.in/bilateral-documents.htm?dtl/29604>

Further Reading:

- https://mnre.gov.in/img/documents/uploads/file_f-1618564141288.pdf
- <https://www.indiabudget.gov.in/economicsurvey/doc/eschapter/echap06.pdf>
- <https://www.investindia.gov.in/siru/one-sun-one-world-one-grid-osowog-india-lynchpin-international-solar-alliance-isa>
- <https://isolaralliance.org/>
- <https://mnre.gov.in/solar/schemes>

AG/HP/RC/TS