



India's Solar Power Dream

This editorial is based on "[Solar energy is not the best option for India](#)" which was published in the Hindu on 01/02/2023. It discusses misconceptions about Solar Energy and ways to harness solar power.

For Prelims: Clean Energy, Solar waste, International Solar Alliance, National Solar Mission, PM-KUSUM

For Mains: Solar Energy and Development in India, Challenges Related to Solar Energy, Government Schemes to Enhance Solar Energy Production in India

India has been **aggressively pushing towards a more sustainable future by investing heavily in renewable energy sources**, with solar energy at the forefront of its efforts. The Government of India has set the target to expand India's renewable energy installed capacity to 500 GW by 2030. India has promised to source **nearly half its energy from non-fossil fuel sources by 2030** and, in the shorter term, source at least 60% of its renewable energy from solar power.

India is committed to reducing the country's dependence on fossil fuels and transitioning towards a greener future, and the growth of the solar sector plays a crucial role in achieving this goal.

India is pushing towards renewable energy due to government's support for the transition. The recognition that solar energy is a free and abundant resource also plays a role. But there are some misconception regarding Solar energy which we need to consider first.

What are the Misconceptions about Solar Energy?

- **Levelized Cost of Solar Power is Coming Down:**
 - It is believed that the levelized cost of solar power coming down and some believe that the cost will decrease linearly over time, that the cost is the same for all regions, that the cost only takes into account the cost of solar panels, that it doesn't include maintenance costs, and that it ignores energy storage costs.
 - In reality, the **cost can be affected by various factors such as technology advancements, changes in market conditions, and government policies**, and the levelized cost takes into account all components of a solar power system including installation and ongoing maintenance costs, not just the cost of solar panels.
- **Financially Viable:**
 - Solar energy is made **financially viable by misguiding the people by leaving out storage battery cost**; handicapping it with subsidies and concessions that are front loaded by the government, and forcing it on the industry and hapless discoms through state policy.

What are the Benefits of Solar Energy?

- **Renewable:**
 - Solar energy is a renewable source of energy, meaning it can be produced indefinitely without depleting resources.
- **Clean:**
 - Solar energy is a clean source of energy, producing no harmful emissions or pollution.
- **Cost-effective:**
 - The cost of solar energy has decreased significantly in recent years, making it increasingly cost-effective as a source of energy.
- **Reliable:**
 - Solar energy systems are becoming increasingly reliable and durable, requiring little maintenance.
- **Versatile:**
 - Solar energy can be used for a wide range of applications, including electricity generation, heating, and lighting.
- **Decentralized:**
 - Solar energy systems can be installed on a small scale, making it possible to generate energy locally, reducing dependence on centralized energy sources.

What are the Challenges with Solar Energy in India?

- **High Initial Costs:**
 - Despite recent reductions in the cost of solar panel technology, the **upfront cost of installation remains high**, which can be a barrier to adoption for many households and businesses.
- **Limited Access to Finance:**
 - Access to finance for renewable energy projects can be limited, **particularly for smaller and rural projects**, which can make it challenging for individuals and organizations to invest in solar energy.
- **Infrastructure and Grid Connectivity:**
 - **A lack of adequate infrastructure and grid connectivity in some areas of the country can make it difficult** to transmit the electricity generated from solar panels to where it is needed.
- **Land Availability:**
 - **Finding suitable land for large-scale solar projects can be a challenge in India**, particularly given competing demands for land for other purposes such as agriculture and urban development.
- **Maintenance and Operation Issues:**
 - Poor maintenance and operation of solar power systems can **reduce their efficiency and effectiveness**, which can impact the long-term viability of renewable energy projects in India.
 - Cleaning solar panels currently is estimated to use about **10 billion gallons of water per year** — enough to supply drinking water for up to 2 million people.
 - Attempts at waterless cleaning are labor intensive and tend to cause irreversible scratching of the surfaces, which also reduces efficiency.
 - Now, **a team of researchers at MIT has devised a way of automatically cleaning solar panels**, or the mirrors of solar thermal plants, in a waterless, no-contact system that could significantly reduce the dust problem.

What are the Related Initiatives?

- **Solar Park Scheme:** The [Solar Park Scheme](#) plans to build a number of solar parks, each with a capacity of nearly 500 MW, across several states.
- **Rooftop Solar Scheme:** The [Rooftop Solar Scheme](#) aims to harness solar power by installing solar panels on the roof of houses.
- **National Solar Mission:** It is a major initiative of the Government of India and State Governments to promote ecologically sustainable growth while addressing India's energy security challenge.
- **SRISTI Scheme:** Sustainable rooftop implementation of Solar transfiguration of India (SRISTI) scheme to promote rooftop solar power projects in India.

- **International Solar Alliance:** [International Solar Alliance](#) is an action-oriented, member-driven, collaborative platform for increased deployment of solar energy technologies.
- **Kisan Urja Suraksha evam Utthaan Mahabhiyan (PM-KUSUM):** The [PM-KUSUM scheme](#) was launched by the Ministry of New and Renewable Energy (MNRE) to support installation of off-grid solar pumps in rural areas and reduce dependence on grid, in grid-connected areas.

What should be the Way Forward?

- **Utilising Large Hydro:**
 - With large hydro, **India can produce more renewable energy** at the least cost and with the least carbon footprint.
 - India has **utilised only about 15% of its hydro potential** whereas the U.S. and Europe have utilised 90% and 98% of their potential, respectively.
 - The **extent of utilisation of hydro potential seems to be an index of civilisational development** and evolution.
- **Expanding Infrastructure and Investment:**
 - India needs to **increase investment in renewable energy infrastructure**, including transmission and distribution networks, as well as in research and development of new solar technologies.
- **Encouraging Private Sector Participation:**
 - The **private sector can play a crucial role in developing and deploying solar energy in India**, and the government should create favorable policies and incentives to encourage private sector involvement.
- **Improving Energy Storage Solutions:**
 - Energy storage systems are **essential for ensuring that solar energy** can be effectively used, even when the sun is not shining. The Indian government should support the development of advanced energy storage solutions to make solar energy more accessible and reliable.
- **Promoting Rooftop Solar:**
 - [Rooftop solar systems](#) can be a **cost-effective and convenient way for households and businesses to generate their own energy**. The Indian government should encourage the growth of rooftop solar by providing incentives, subsidies and tax credits.
- **Building a Skilled Workforce:**
 - The growth of the **solar energy sector in India will require a skilled workforce**. The government **should invest in training and education programs** to build a pipeline of skilled workers who can help deploy and maintain solar energy systems.

Drishti Mains Question

What are the major challenges faced by India in promoting and implementing the use of solar energy as a sustainable source of energy?

UPSC Civil Services Examination Previous Year Question (PYQ)

Prelims

Q. Consider the following statements: (2016)

1. The International Solar Alliance was launched at the United Nations Climate Change Conference in 2015.
2. The Alliance includes all the member countries of the United Nations.

Which of the statements given above is/are correct?

- (a) 1 only
- (b) 2 only
- (c) Both 1 and 2
- (d) Neither 1 nor 2

Ans: (a)

Mains

Q. India has immense potential of solar energy though there are regional variations in its developments. Elaborate. **(2020)**

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