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"Recent Development in India's National Solar Mission"

by Dr Juzer Vasi, Emeritus Professor IITB on line lecture held on
9th October 2020, 5.00 Pm

In the webinar Dr. Juzer Vasi*, Emeritus Professor IITB, shared overview on challenges and opportunities and information on* ***"Recent Development in India's National Solar Mission."*** *In this talk Dr.Juzer Vasi explained the Indian efforts in National Solar Mission and its position and role at international solar alliance. He also explained how India has achieved solar energy target more than the set targets. India is having third position globally in producing solar power. Discussion on the technologies and physics involved in solar panel development and deployments. His talk presented an overview of solar photovoltaics, challenges as well as opportunities provided by the National Solar Mission. The talk also covered important new technology developments world-wide, the effects on India's National Solar Mission.*

Introduction

The Jawaharlal Nehru National Solar Mission (JNNSM), or the National Solar Mission, is an initiative of the Government of India and State Governments to promote solar power in India inaugurated in January 2010. The International Solar Alliance (ISA) is an alliance of 121 countries initiated by India in 2015. The solar energy target was from 20GW to 100GW by 2022. In 2020 Government announced 450GW of renewable energy by 2030 of which 300GW would be solar energy with an investment of Rs. 10 lakh Crore. The session began with a unique short summary of Dr. Juzer Vasi's introduction, his work engagements, and his association with prestigious institutions like IIT Bombay, National Centre for Photovoltaic Research and Education (NCPRE) that was set up at IIT Bombay in 2010 to support JNNSM, fellow of IEEE, INAE. His association and contribution to the Dandi project. Talk was followed by engaging interactive Q & A Session.

Physics of Solar Energy

There are mainly two types of solar power generation technique. First one is the concentrating solar power where solar energy is used to produce steam that drives the turbo-generator set. The second method is and Photovoltaic (PV) solar energy, which converts solar radiations (photons) directly into electrical energy using semiconductor based solar cells. Solar photons upon hitting the semiconductor surfaces produce electrons and holes. Inbuilt PN junction separates electrons and holes which flow to the electrical circuits through good contacts on the semiconductor material.

Opportunities

India has good availability of sunlight throughout the year. PV is clean and sustainable electricity generation suitable for rural area as it is off-grid and highly scalable PVs are scalable from 10W to 1GW. Two largest solar parks in the world are in India. Solar module and system cost has reduced drastically – around 2.50 per unit. India has split 100GW target into 60GW of large solar parks and 40GW of rooftop solar.

Challenges for 100 to 350GW targets

Challenges needs to be converted into opportunities as power degradation percentage per year is more in India as compared to other countries. Losses due to soiling can be reduced by Robotic, waterless cleaning and development of anti-soiling coatings. To ensure 'Firm' availability of renewable power storage is necessary to take care of variation PV generation at different times of the day. However, cost of power storage is also high. Land availability is challenge in India which can be overcome by floating solar, Agrivoltaics and Rooftop solar.

Key takeaways

- Under Jawaharlal Nehru National Solar Mission (JNNSM), the solar energy target for India was from 20GW to 100GW by 2022.
- In 2020 Government announced 450GW of renewable energy by 2030 of which 300GW would be solar energy with an investment of Rs. 10 lakh Crore.
- Harnessing solar energy using Photovoltaics (PV) is clean and sustainable electricity generation suitable for rural area as it is off-grid and highly scalable PVs are scalable from 10W to 1GW.
- To ensure 'Firm' availability of renewable power storage is necessary to take care of variation PV generation at different times of the day.
- Land availability is challenge in India which can be overcome by floating solar, Agrivoltaics and Rooftop solar.