Vol. VI - No. 2 July - December, 2019

# Climate SAR सार

Climate Science And Research

## CLIMATE CHANGE AND SOLAR CITIES

Climate Change Research Institute
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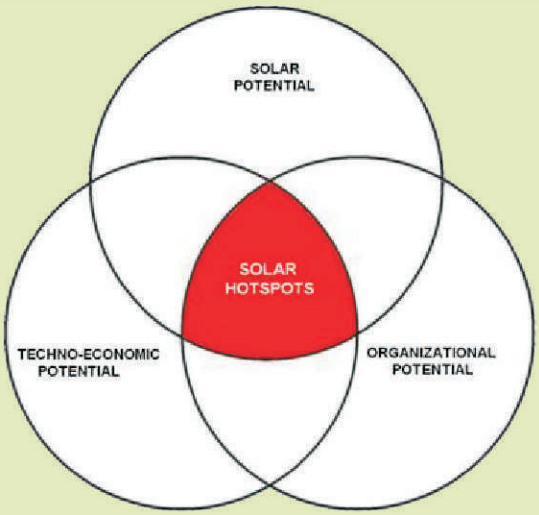
# FROM EDITOR

*"Life on earth is heliocentric as most of its energy is driven from the sun."*




*India being a tropical country, there is plenty of sunshine throughout the year and 'solar hotspots' are many. Solar as alternative for power generation among the available clean energy options, has high global warming mitigation potential. India is third largest carbon-emitting country in the world. Progress in solar energy will help in meeting India's NDCs of Paris Agreement of Climate Change.*

*India has set a laudable target to achieve the installed capacity of 175GW from renewable sources of energy by 2022, out of which 100GW is to be met from solar energy. A total of 36GW has been achieved by September 2019.*

*The Climate Change Research Institute has started Bulletin of Climate Science and Research – '**Climate SAR**' and is helping in knowledge dissemination about topics related to climate change. Ms. Komal Bora has painstakingly collated the information about solar cities in India.*

*In this issue you learn about development of solar cities in India. Please do send your feedback or information update to contactus@ccri.in*

**Dr. (Mrs.) Malti Goel**
President
Climate Change Research Institute

## BACKGROUND

**India is among 196 countries who have signed Paris Agreement on Climate Change in December 2015. Key features of India's Nationally Determined Contributions (NDCs) are;**

**(i) To reduce the emissions intensity of its GDP by 33 to 35 per cent by 2030 from 2005 level.**

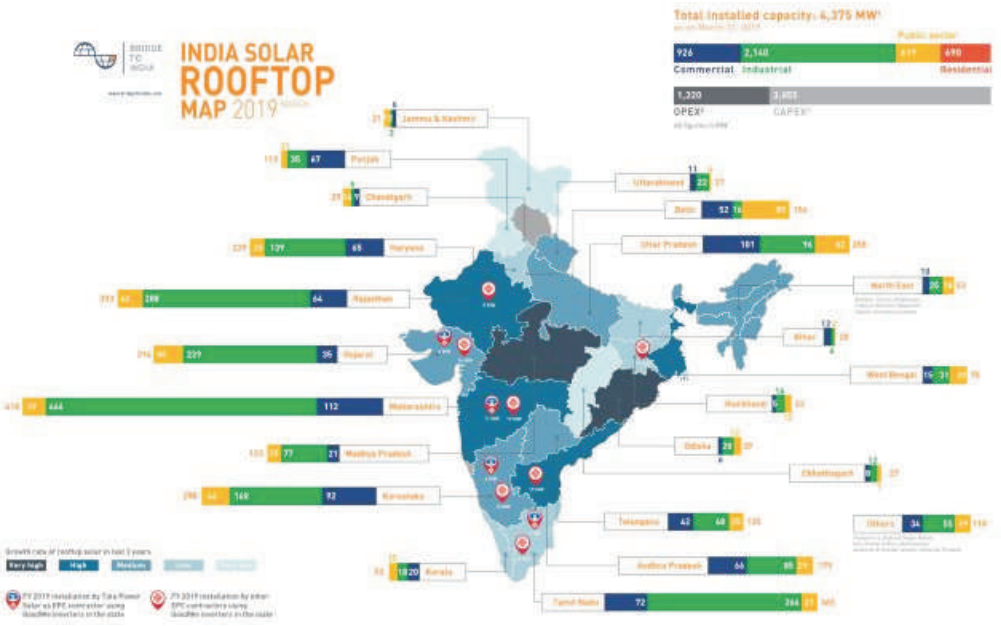
**(ii) To achieve about 40 per cent cumulative electric power installed capacity from non-fossil fuel based energy resources by 2030, with the help of transfer of technology and low cost international finance, including from Green Climate Fund.**

**(iii) To create an additional carbon sink of 2.5 to 3 billion tonnes of CO2 equivalent through additional forest and tree cover by 2030.**

## WHAT IS A SOLAR CITY?

*"It's all about small steps towards Solar Energy and Sustainability"*

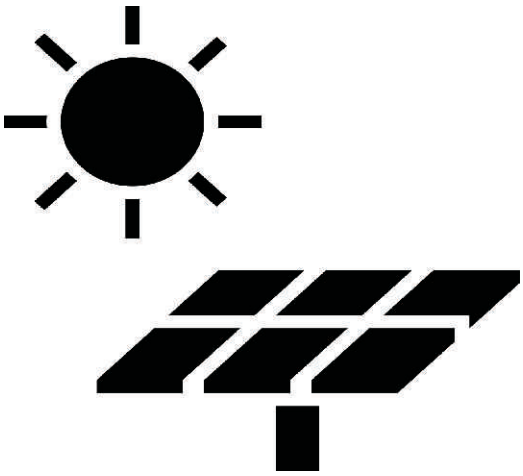
**According to the Solar City Programme, a solar city is the city which aims at achieving at least 10% reduction in projected demand of conventional energy at the end of five years, through a combination of enhanced supply from renewable energy sources as well as energy efficiency measures. In a Solar City, all types of renewable energy based projects like solar, wind, biomass, small hydro, waste to energy etc. are promoted along with possible energy efficiency measures depending on the need and resources availability in the city to achieve this target.**

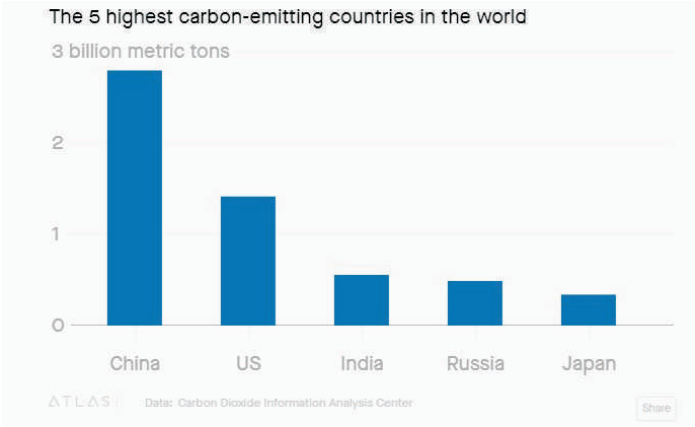


# WHY A SOLAR CITY?

Climate Change, urbanization, and increasing population are the factors, putting pressure not only on the land, but escalating energy demand. India being a developing country, several cities are experiencing rapid growth in their energy demand. They needed to come up with certain sustainable solutions using clean energy technology. “Solar city” is one such idea wherein the local bodies will be given opportunity to become “Renewable energy city” with the support from Government. Moreover, India needs to fulfill its NDCs, for which this programme would be of great help.

Being a tropical country with plenty of sunlight throughout the year, India has been striving to build solar cities for long. The first solar






city was proposed as Anandpur Sahib in Punjab promoted by Punjab Renewable Energy Development Agency (PEDA) in 1999. Ministry of New & Renewable Energy (MNRE) initiated a scheme for 'Development of Solar Cities' in 2008. To achieve the solar energy target, Government of India has modified and sanctioned the revised programme in 2014 for implementation during 12th five year plan. A total of 60 cities in the 29 states of India were proposed to be solar cities.

**Master Plan** for 49 cities has been prepared. Master plan comprises of base plan for energy consumed during 2008, and energy demand forecast for 2013 and 2018. Sector wise strategies and action plan for implementation are included. Although, a single state should have minimum one solar city, it can have up to seven solar cities.

# SURAT, GUJARAT

Surat is on way to become India's leading Smart-Solar City. It is the first city to mobilize consumer demand for Rooftop Solar in India. To harness this substantial solar resource available in the city a subsidy of Rs20,700 per kWp has been offered by MNRE. Gujarat Energy Development Agency (GEDA) also provides a subsidy of Rs10,000 kWp with a maximum limit of INR 20,000 per consumer.

Solar Rooftop program was launched on September 22, 2016; which is now celebrated as the "Solar Equinox Day", a Mega Event on Rooftop Solar Energy for Surat Smart City". A study by TERI has estimated that, the solar rooftop potential of 124 GW is distributed amongst various smart cities of the country; of which nearly 418 MW (3.5%) exists in Surat.

Public awareness through workshops on 'Advantages of installing Grid Connected Rooftop (GCRT) systems and Net Metering' to encourage Solar Rooftop and mass publicity for the common public by creating a team of solar friends were carried out through various means.

Surat becomes first district to have 100% solar powered health centers (PHCs). Surat has a total of 52 PHCs in the district.

The city is also in the process of converting nearly 208 schools under SMC into Model Green Schools under the 'Green Campus Scheme' of MNRE, by combining GCRT and energy-efficiency (EE) measures.

# AGARTALA, TRIPURA

Agratala in Tripura was seen as emerging first Solar City of North East in 2012. Various schemes including Remote Village Electrification Programme, Jawaharlal Nehru Solar Mission, Solar City Programme, National Biogas and Manure Implementation Programme, Unnat Chulha Abhiyan Programme and Solar Lantern Programme are helping the city to achieve its target faster.

A 50kW plant was inaugurated in September 2012. 700 hamlets and 50 villages in Tripura state are already using solar energy benefitting more than 350,000 families. Tripura Gas Based Power Project (101MW), Monarchak, is located 70 kilometers from Agartala is the largest Grid Interactive Solar Power Plant in the Region of India.

**CHANDIGARH is on the path of becoming second solar city and has launched projects to solarize the city.**

# SOLAR VILLAGES

**Dharnai village in Bihar has become India's first solar powered village powered entirely by solar electricity with solar powered micro-grid of 100 kW system. It is the first Indian village to declare itself an energy-independent village on 20July 2014.**

**Baripatha, a tribal village about 25 km southwest of Bhubaneswar became the solar powered village in Orrisa. This rural village model is quite different as set up individual units for each household is proposed unlike other projects which have a central unit which supplies power to all the households. The model followed in this village is low-cost, low-maintenance and community-owned-elements to be replicated in 3900 villages in Orrisa.**

**Bacha, Madhya Pradesh is the first village in India to run solar energy dependent kitchen. All the 75 households rely on the solar-powdered stoves.**

# SOLAR CITY NEWS


**Cochin International Airport, Kerala, India became the world's fully solar powered airport in 2015 with a 12 MW solar power plant. The airport has received the highest environmental honour "Champion of the Earth Award" by United Nations. (World Economic Forum)**

**Kamuthi Solar Plant, Tamil Nadu is one of the largest solar power plant of capacity 648 MW of clean and green energy spanning in 10 sq km: enough space to organize 476 parallel football matches. The solar power plant contains 25 lakh individual solar panels.**

**Island Diu has two solar parks spread over 0.2 sq. km and the solar rooftops on 112 government buildings, meeting its electricity needs completely from solar energy during the day.**

**Pavagada, Karnatka is a 2000MW park named as Shakti Sthal. It spans 13,000 acres spread over five villages.**

**Bhadla Solar Park near Jodhpur has proposed capacity of 2255 MW in 10,000 acres.**

# NEW INITIATIVES IN SOLAR ROOFTOP

**Gujarat Government** has launched Solar Rooftop scheme and made a provision of 1,000 crores provide direct benefits more than 2 Lakh families, who will adopt solar in the financial year 2019-20. In this Scheme, beneficiaries receive a subsidy of 40% for up to 3 kilowatts (kW) system and a subsidy of 20% for a system of 3 kW to 10kW.

**"Solarise Dwarka"**, is an initiative by BSES Rajdhani Power Limited aimed to promote 506KW of grid connected rooftop. It is being implemented by BRPL in collaboration with TERI and GIZ (Deutsche Gesellschaft für Internationale Zusammenarbeit), India and the first plant has been installed with 100kW capacity.

**The I-SMART Program** is a GIZ and MNRE(Ministry of New and Renewable Energy) supported initiative aimed at promoting the rooftop solar market across India to contribute to the NDCs. This program aims to aggregate demand for 1GW rooftop solar systems across three States (Gujurat, Himachal Pradesh and Uttarakhand ) and three Union territories (Daman & Diu, Dadra & Nagar Haveli and Jammu & Kashmir).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