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Why the Rooftop Solar Market is on fire in India?

Despite the 'growth of sorts' achieved in the past few years, India has miles to go before it achieves the solar rooftop target. According to the Bloomberg New Energy Finance report, the pace of new installations needs to double every year between now and 2022 if we were to achieve the 2022 target.

INTERVIEW

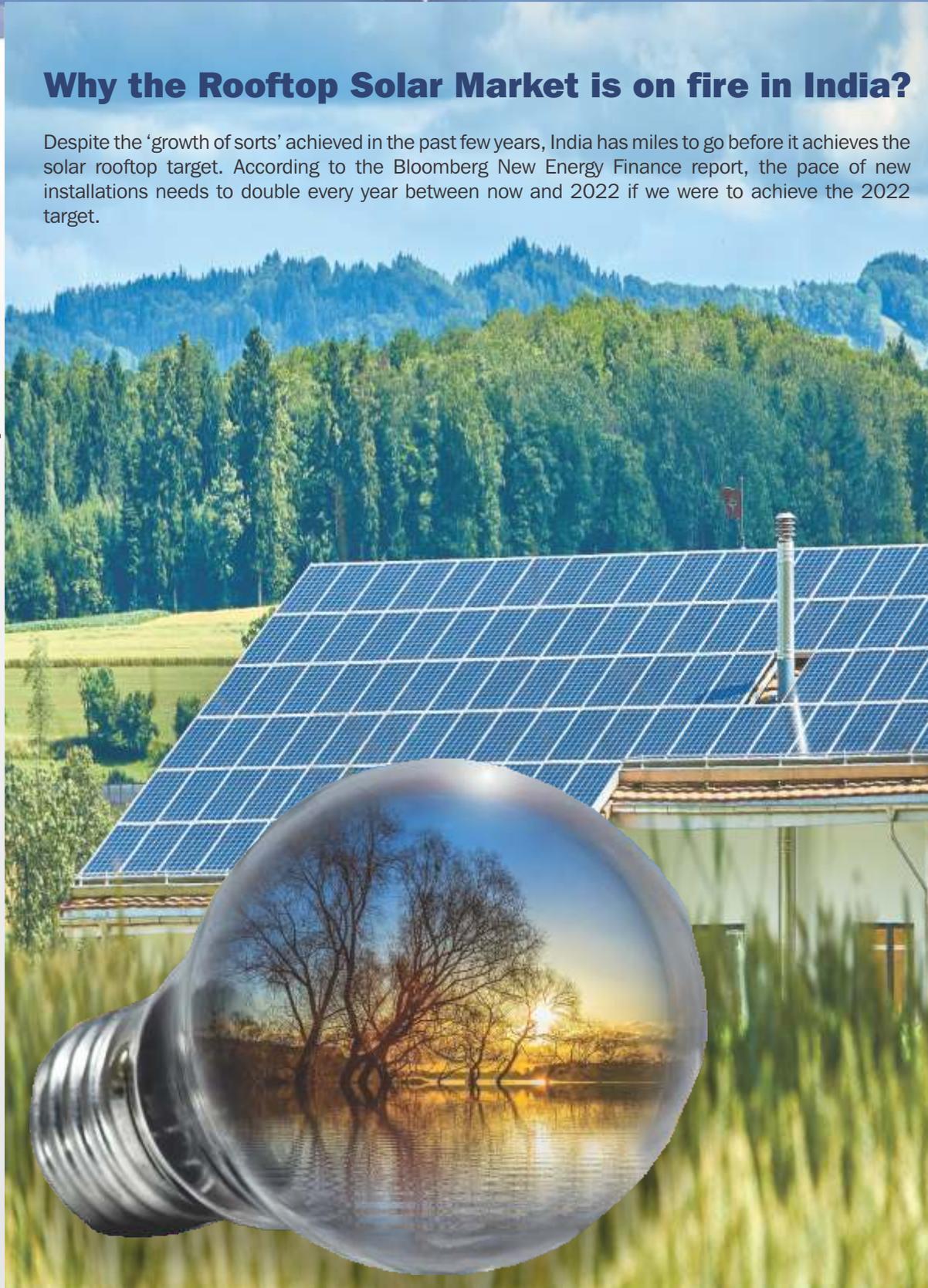
- **Dr. Gundu Sabde,**
Chairman and
Managing Director,
RelyOn Solar Pvt. Ltd.

ARTICLES

- **Why the Rooftop Solar Market is on fire in India - SOLAR POWER**
- **FRP and the 'No pains, All gains' proposition for rooftop solar power - SOLAR POWER**
- **Rooftop Solar Power Plant: Requirements & Challenges - SOLAR POWER**

EVENT

- **RENEWX 2018**





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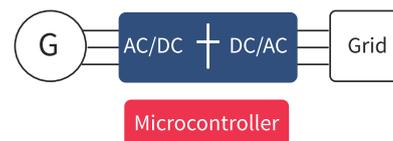
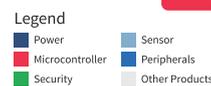
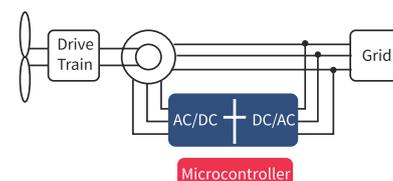
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EDITORIAL

Dear Energetica India Readers,

Energetica India welcomes you to the March-April 2018 issue. In addition to our online and print subscribers, the issue will also be distributed at Renewx 2018 in Hyderabad.

The Indian government is working to create an ecosystem focused on sustainability and especially in the power sector. Power and New & Renewable Energy Minister R K Singh has urged battery manufacturers to set up units in India and offered all possible support from the government to create an enabling ecosystem for investments. The meeting was to discuss incentivizing battery manufacturing in India. The government expects the future demand to increase with the government promoting e-vehicles in a big way. Also the future bids in renewable energy will be for solar/wind hybrid coupled with storage. A policy in this regard is expected soon with the focus being "Make in India".

India, recently, had its moment when Microsoft inked its first-ever renewable energy deal in India, a small solar Power Purchase Agreement with Atria Power in the Indian state of Karnataka. Microsoft will purchase 3 MW of solar power from Atria Power. The power is intended for powering Microsoft's new office building in the city and

will account for 80% of the building's electricity consumption.

Energetica India, in its March-April 2018 issue, meets up with industry leaders to learn more about the industry's latest trends and opinions:

- Dr. Gundu Sabde, Chairman and Managing Director, RelyOn Solar Pvt. Ltd

Highlights of the March-April 2018 Issue:

- **Why the Rooftop Solar Market is on fire in India - Mr. Kunwer Sachdev, MD, Founder, Su-Kam**

Despite the 'growth of sorts' achieved in the past few years, India has miles to go before it achieves the solar rooftop target. According to the Bloomberg New Energy Finance report, the pace of new installations needs to double every year between now and 2022 if we were to achieve the 2022 target.

- **FRP and the 'No pains, All gains' proposition for rooftop solar power - Mr. Ankur Kothari, Chief Operating Officer ? Arvind Composites, Part of Arvind Limited**

GI (galvanized iron) or MS (mild steel) materials used to design solar rooftop

structures have two fundamental drawbacks; they are heavy and prone to corrosion. The search for a material that is both light and maintenance-free ends with fiber-reinforced plastic (FRP). FRP is a lightweight alternative to steel and doesn't corrode even when exposed to harsh environmental conditions.

- **Rooftop Solar Power Plant: Requirements and Challenges - Mr. Khyati Vyas, Business Development, Chemtrols Solar Pvt. Ltd.**

Target consumers of rooftop solar are mostly not technical, so it becomes important to generate awareness about adoption of solar power to them. The government has taken many steps to make rooftop solar popular among the consumers and industries. To overcome the challenges developers need to be more future ready. Even with the challenges, we expect the rooftop solar sector to remain one of the fastest growing cultures among the market over the next five years.

We hope you enjoy reading our work.

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ON COVER

Why the Rooftop Solar Market is on fire in India?

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Aerial Mapping of Bengaluru's Rooftop Solar Potential

CSTEP has developed a tool that would accurately assess the potential of solar photovoltaics on rooftops in Bengaluru along with the associated business case for all consumer categories. The project involved using aerial Light Detection and Ranging (LiDAR) technology to develop high resolution 3D maps of the city including building heights and neighbouring obstacles such as trees, other buildings, poles, billboards.

The Center for Study of Science, Technology and Policy (CSTEP) has been engaged in a first of its kind project, which started in 2016, to develop a tool

that would accurately assess the potential of solar photovoltaics on rooftops in Bengaluru along with the associated business case for all consumer

categories. The project involved using aerial Light Detection and Ranging (LiDAR) technology to develop high resolution 3D maps of the city including

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SPEAKING TO...



Energetica India speaks with Mr. Saptak Ghosh, Research Scientist, Center for Study of Science, Technology and Policy (CSTEP) to learn more about this research.

ENERGETICA INDIA: Please explain our readers what Aerial Light Detection and Ranging (LiDAR) technology is and how it was used for solar mapping

SAPTAK GHOSH: LiDAR technology creates 3D

maps of urban centres with individually digitised rooftops, which include shading effects of tree canopies, poles, cables and buildings. Using LiDAR is preferred over digitised GIS maps because LiDAR-based maps take the

height of neighbouring obstacles into consideration, which allows for accurate shadow analyses. Moreover, LiDAR-based maps require less than four months for construction, as compared to the nine months required for preparing

building heights and neighbouring obstacles such as trees, other buildings, poles, billboards, etc. The aerial data gathering flights started on February 19, 2018 and the last flight took off on March 6, 2018, after 15 days of flying. This exercise was carried out by Geokno India Pvt. Ltd.

The data will now be processed to account for shading aspects after digitising each rooftop. The solar rooftop potential will be calculated based on shadow-free area and the associated economics will be estimated by linking the BESCO consumer ID linked with a specific rooftop. The tool will be made freely accessible to all consumers in 6-7 months from now. From a planning perspective, the results obtained from the tool will be used to identify the most suitable rooftops in the Bengaluru area to achieve the 1 GW of rooftop solar capacity target, by 2021-22.

Additional Chief Secretary, Energy - Shri Ravi Kumar - said that the project is an innovative way to map solar rooftop potential in densely populated cities. The results of this exercise will lay the foundation for replicating such efforts in



other cities in Karnataka and the rest of the country. The time taken to finish this exercise using other means or technology would be far greater considering the levels of accuracy expected from the usage of aerial LiDAR. The raw data collected can also be processed to help in other city planning applications such as tree cover densities, surface water drainage systems, road

networks, etc. The Government of Karnataka will explore these options to maximise the utility of this project.

CSTEP is grateful to MacArthur Foundation for generously funding this project. CSTEP also is thankful to the Energy Department, Government of Karnataka and BESCO for their continued support all through this project.

manually digitised GIS maps.

This project, wherein we will be mapping the RTPV potential of Bengaluru, used an airborne LiDAR device attached to the nose of a low flying helicopter. The technique involves using a laser to measure the distance between an aircraft and the ground. A LiDAR system takes up to 100,000 measurements every second, and generates highly detailed terrain and surface models at spatial resolutions between 25 cm and 2 m. We will use the 3D maps of the covered area as base layers for further calculations and analyses.

Using the results of the LiDAR-based exercise, the shadow-free area on each

rooftop will be calculated using solar geometry principles. The tool will calculate the rooftop solar PV potential for this area and design a suitable system. Users accessing the tool can customise the system design by choosing which part of their rooftop they want to use for solar installations. The resultant system design, along with the associated business case - estimated after linking the consumption data from BESCO's database - will be presented to the user as an output of the tool. The user can then make an independent, informed solar rooftop investment decision.

ENERGETICA INDIA: How will this information be shared with the

Indian solar industry?

SAPTAK GHOSH: The methodology followed in this project is public information. We will make the report and the manual for the tool available in the public domain, once they are ready.

ENERGETICA INDIA: What was the role of MacArthur Foundation in this study?

SAPTAK GHOSH: MacArthur Foundation provided CSTEP with a generous grant to undertake this innovative pilot project. CSTEP is grateful to MacArthur Foundation for the belief and confidence shown by them and enabling us to execute this first-of-a-kind project in India.