

India's Solar Cities Shine Light on Renewable Energy and Efficiency

Switch Board, Tuesday, 23rd September 2014

The new Indian government has marked 100 days in office this month. With “fresh” being the buzzword making the rounds, even the Ministry of New and Renewable Energy (MNRE), under the leadership of Minister Piyush Goyal, is considering revamping the country’s flagship National Solar Mission (NSM) and making it considerably more ambitious. The recently announced draft scheme for solar parks is only a part of this new development. Last week Minister Goyal stated that India has the potential to deploy 100,000 MW of solar.

The MNRE’s Solar Cities program is certainly a step in the direction towards where the new government hopes to take India. Earlier this year, the MNRE organized a “National Meet on Solar Cities” in the city of Chandigarh. This meet was organized two years after the last summit, reflecting a fresh wave of optimism and renewed enthusiasm for deployment of large-scale solar in India. The MNRE was keen to bring representatives from across urban local bodies (ULBs) in the country – “policy-takers” if you will – for an entire day to share their experience and put forth their perspective on developing their own solar city. Policy makers from the MNRE and other policy and finance experts from the likes of the Asian Development Bank, Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ), the World Bank, NRDC and The Energy and Resources Institute (TERI) came together to facilitate a robust discussion focused on innovative deployment and financing models, and outcomes summarized by Joint Secretary Tarun Kapoor himself.

At the outset, the solar cities program has a clear objective: reduce India’s fossil fuel-based energy consumption and advance large-scale solar in India with one consolidated central financial assistance (CFA) based policy that covers all kinds of solar installations, including power, rooftop, and heaters. Cities are required to reduce 10 percent of their fossil fuel-based energy consumption to qualify as a solar city and the national target is to develop a total of 60 solar cities throughout the country that can achieve this feat. The challenge, however, is to choose from an ambit of options and focus resources on the intervention that would make the most significant difference to the energy consumption level of the city.

The low hanging fruit – as articulated by the MNRE – includes advancing energy efficiency in buildings and deployment of decentralized (off-grid) solar energy across cities in India. In urban India, cities and towns are experiencing an unprecedented growth in their peak electricity demands, and in the face of the challenge posed by this rapid rise in demand, currently experience significant and consistent power outages. This is exacerbated by the existence of significant transmission and distribution (T&D) losses associated with grid electricity and a palpable lack of high quality reliable power in India. As a means to ensure constant electricity support, large industrial, commercial and residential establishments across India currently rely on diesel generators for expensive back-up power.

Two clear solutions emerge from these significant challenges.

Buildings Energy Efficiency: Adopting the Energy Conservation Building Code (ECBC)

In January 2014, the state of Andhra Pradesh announced its adoption of the ECBC - a game-changer to lock in energy savings in buildings. In fact, according to the analysis in our issue brief, *Building Efficient Cities: Strengthening the Indian Real Estate Market Through Codes and Incentives*, coauthored with the Administrative Staff College of India (ASCI), if states across India adopted the ECBC and developers participated in strong programs for rating commercial buildings, an estimated 3,453 TWh of cumulative electricity could be saved by 2030. This is equivalent to powering 358 million Indian homes annually between 2014 and 2030 based on current annual consumption levels for electrified homes. Additionally, 1,184 million tons of carbon dioxide emissions could be avoided by 2030 – equivalent to the annual emissions from more than 17 typical coal-fired power plants over that same time period.

How this can actually be achieved is easily demonstrated by buildings across the country that are setting the example for others to emulate. Our case studies on the Godrej Bhavan in Mumbai (“Saving Energy and Money: Case Study of the Energy-Efficiency Retrofit of the Godrej Bhavan Building in Mumbai”) and the AECOM office building in Noida (“Building Smart from the Start: Spotlight on

Energy-Saving Commercial Office Building in Noida, India”) clearly demonstrate, the quantum of savings and benefits accrue to owners, builders and users of energy efficient buildings.

Decentralized Solar Power

With 300 sunny days a year, India has a significant opportunity for Distributed Decentralized Generation (DDG) of solar power across the country i.e. generation of power by small, modular systems located near the place where the energy is used.

With a high population density, land required for solar projects will be hard to come by in India in the future. Indian cities can leverage rooftop space to fill the gap. Rooftop projects also improve productivity as transmission and distribution losses are reduced, and they require a shorter payback period as compared to large grid-connected power plants.

Given the challenges of providing grid access to remote locations and the high costs of diesel-based generation, off-grid power generated near demand centers can prove to be more beneficial than utility scale generation in areas far flung from demand centers. Even in cities that are grid-connected, rooftop solar PV power systems provide cheaper electricity than that provided through diesel generators in the absence of reliable and quality grid power.

Use of energy efficiency and decentralized renewable energy are key solutions to solving the chronic power outages, providing energy access to all, and solving global climate change. India’s continued economic development depends on providing more affordable, clean and reliable energy and moving away from fossil fuels. In addition to reducing dependence on energy imports and increasing energy security, shifting the market towards energy efficiency and renewable energy offers an incredible payback for India as a whole