

## EW / INTERIOR

**W**ith more than 23 million households in India still without electricity, we need not look any further than the sky to find a solution. The Sun is the most abundant source of energy and is freely available everywhere. The potential for solar lighting in Indian homes is huge and is growing rapidly. While the adoption of this technology is 100% in remote areas, where there is no grid electricity or poor quality of grid power, even in urban areas there is a steady increase in adoption. The popularity is spreading to urban areas in India and is not restricted to areas where power cuts are largely a common occurrence. Today, the market for

solar lighting is projected to grow at a CAGR (Compound Annual Growth Rate) of 40%. So let us take a look at how bright the future is for solar powered lighting in India.

### Market for Solar Lighting

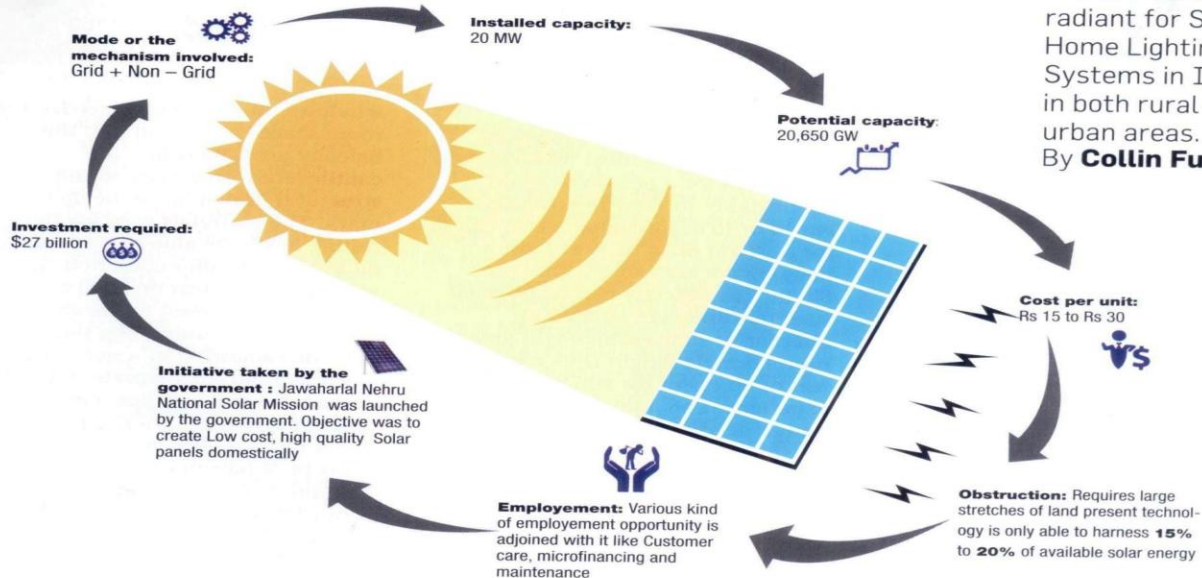
As we reach the point of near depletion of our fossil fuels, the hunt has begun for renewable sources of energy. After years of research, solar technology today has reached a pinnacle. The solar lighting market is growing at a faster than ever pace.

According to Ajay Goel, CEO, Tata Power Solar, "The solar lighting home products market is focused on off-grid (no access to electricity) and under-electrified (highly unreliable access) markets which are further

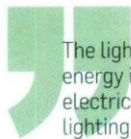
stratified by a range of incomes, as the absence of the grid cuts across income classes in many areas. Approximately 1 lakh home lighting systems have been installed in financial year 2012-13 and Ministry of New and Renewable Energy (MNRE) has set a target of making 20 lakh home lighting systems available till 2020". This is a huge number considering how limited the number of solar lighting systems were being used in homes just a few years ago in India. And although the demand for it is exceedingly high in rural parts, it seems to be growing with time in urban India too. With power cuts and load shedding increasingly becoming a common occurrence even in the

# Light up your Home the Solar Way

It is time we harnessed solar energy to light up millions of households in India. As the scope is great, the market too looks radiant for Solar Home Lighting Systems in India in both rural and urban areas.  
By **Collin Furtado**







The light produced by solar energy is as powerful as electric lights. Hybrid solar lighting doubles the efficiency and affordability of solar energy and it is simultaneously easy to install. It is anticipated that solar energy equivalent to over 15,000 times the world's annual commercial energy utilisation reaches the earth every year. Solar energy is the most readily available and free source of energy since ancient times". BCC Infrastructure has made use of solar lighting at various places in their project Bharat City."

**Kumar Bharat,**  
Director, BCC Infrastructure

heart of certain metros, people are increasingly investing in solar lighting systems for their homes.

In places where load shedding for over six hours and more is experienced, solar lighting in the form of small solar power packs to large home lighting systems are being used by many instead of diesel generators and heavy inverters. "The market size is very miniscule when you compare it to conventional sources of energy. However, looking at how some of the states like Gujarat, Tamil Nadu and Andhra Pradesh among others have now drafted dedicated solar energy generation policies for residential households and commercial establishments, the future looks sunny", said Shabhaang Gupta, Director, Solar Universe India.

### Key Players in Solar Lighting Market

As the market for solar lighting keeps growing so have the number of players that offer various products in the market. By and large, the solar lighting market in India is still unorganised, but a few players have emerged ahead and continued in the market. A majority of these players have a large presence in rural and semi-urban regions of the country. These players are now turning towards urban India as the market is

### Benefits of solar lighting

Solar lighting offers several benefits in comparison to conventional lighting systems.

- One of the most common benefits is that it does not require a power grid and this makes it exceptionally beneficial in areas that are far from power grids.
- The solar lighting systems are also available to fit customised needs of people from small individual houses to large buildings. According to World Bank estimates, 780 million women and children breathing kerosene fumes inhale the equivalent of smoke from two packs of cigarettes a day.
- Solar lanterns produce no fumes and more light.
- In addition to this, solar lighting helps save costs spent on electricity charges or on any other lighting fuel.
- Energy conservation is one of the most important benefit that solar lighting offers, as it helps conserve the planet's valuable resources that are commonly used to produce conventional power.
- Solar lighting systems also are low

on maintenance and last for several years in comparison to conventional lighting systems.

- Apart from this, it does not contribute to Global Warming. While carbon emission from coal used to produce conventional electricity amounts to approximately 6 tons of carbon dioxide over the 20 year life of one Photovoltaic (PV) system. Nuclear wastes produced from Nuclear power plants on the other hand have far more disastrous effects on the surrounding areas.
- Although solar lighting systems are costlier in terms of the initial cost, it wins over conventional lighting due to the much longer lifespan, zero costs operation and negligible maintenance costs.
- Solar lighting is equally efficient as that of conventional lighting in terms of brightness, as the lumen used in both the formats are just the same.
- Most solar lighting systems are LED-based and consume far less energy while giving a better lumen output.



fast expanding here.

Solid Solar, a division of Gautam Polymers, is India's Largest Solar lights manufacturer and leading provider of rooftop solar power plants over the last 15 years. The division led by Shubhra Mohanka, a well seasoned solar professional said, "Working in this industry for over 15 years now, it has given us much understanding about the market and the places where solar lighting is a requisite. And it has been an attempt of Gautam Polymers to have catered to all such places. Starting from Jammu & Kashmir to places in Tamil Nadu and in distant villages plus cities, Gautam Polymers has covered it all. Having covered over 1,500 projects all over India and abroad; thus enlightening numerous lives, our market is well spread in urban and rural areas in multiple states and countries."

Solar Universe India offers a wide range of solar products from simple consumer based products such as Solar Lanterns and Fans to the more advanced applications like Solar Home Lighting Systems and Solar Streetlights. With a distributor network of 75 teams backing them,

this company is slowly but steadily rising in the market.

Tata Power Solar, a 100 per cent Tata-owned Tata Power subsidiary, is the largest solar power company in India. Established in 1989, Tata Power Solar (earlier Tata BP Solar) was a joint venture between Tata Power Company and BP Solar, one of the largest solar companies in the world. The company is a fully integrated solar solutions provider from wafer to cell, module, systems, installation, commissioning, maintenance, service and training. It even registered a sales turnover of over Rs 932 crore in 2011-2012. "Since the solar market in India has a lot of players in the unorganised and regional space, it will be difficult to peg the size of the market accurately. However, from our analysis and understanding of the market, we believe that our share in the solar lighting market to be about 35-40% in 2012-13", said Mr Goel. When it comes to solar lighting, Tata Power Solar produces CFL and LED based home lighting systems, small solar inverters for individual homes like for ANERT Kerala and small range community



## Roadblocks

- One of the major roadblocks in adopting solar lighting is the lack of awareness. "There are certain sections of the society which are still not aware of the existence of solar products, or, are oblivious of its benefits."
- The markets which are in greatest need of these products are also typically, the most difficult or uneconomical to reach, hence, arises the problem of distributing and servicing the products in such markets", said Mr Goel.
- Some of the other problems are getting trained manpower for installation and services, easy and accessible financial support

to buy these systems and lack of consumer education regarding its environmental, economical and health advantages. From an architectural point of view, Ar. Jyoti Jadhav, Director, Archetype Consultants (I) Pvt. Ltd said, "The designs of the solar panels, cylinders are limited and are yet to be explored. As the existing set up eats up lot of space and has many hidden costs, it is less appreciable. Also, projects are done with solar lighting as one of the compulsions by the municipal bodies. It will help if taken seriously right from the onset of the project". The company has incorporated solar lighting in some of their projects.

power plants (2 – 6KW) for small villages. With a sophisticated 84 MW solar cell manufacturing unit that can process mono and multi-crystalline wafers of 125mm2 and 156mm2, it is currently the biggest player in India with a presence in neighbouring countries.

## Government Initiatives

The government is gradually taking little steps to promote solar energy. In rural areas, the village leaders who are willing to set up a solar power plant are given 50% subsidy

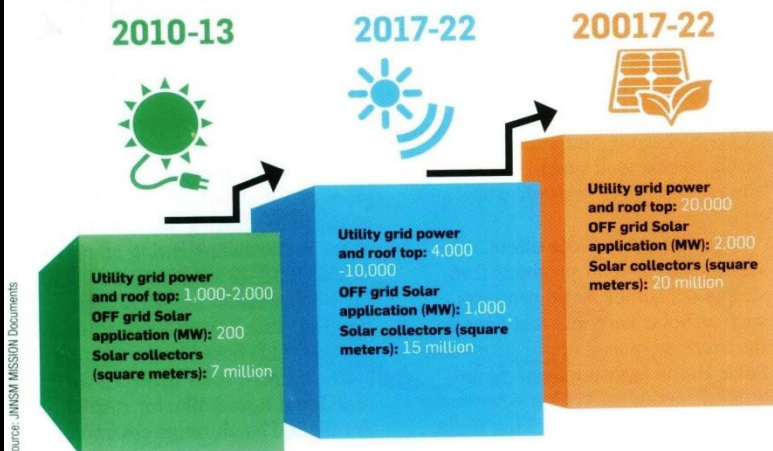
by the government, for up to 200 MW. In some of the villages such efforts have already paid off. "The Government of India launched an ambitious plan of achieving grid parity by 2016 and generating 22GW of Solar Energy by 2020. The policy popularly known as Jawaharlal Nehru National Solar Mission (JNNSM) has drawn eye balls all over the world. Positive policies from various states such as Gujarat, Rajasthan, Chhattisgarh, etc. also aim to include Renewable Energy sources like Solar Energy in

## Solar Home Lighting Solution

- SHLS consists of a solar PV Panel, battery, charge controller and lighting system.
- Depending on the PV panel size, this system can power a lighting system ranging from a single lamp to several lamps and a fan or TV.
- In spite of generous support from the government, so far only 580,000 SHLS have been installed. However, it is unclear if this includes those installed by private players without availing a government subsidy.
- About 98 million rural households can afford and benefit from SHLS.

their power mix", added Ms Gupta. MNRE is providing 30% subsidy through state nodal agencies and 40% subsidy through NABARD (National Bank for Agriculture and Rural Development) for all home lighting systems. "The finance minister could have supported the domestic solar industry by increasing the budget outlay for solar energy and imposing duties on import of solar products. Currently, there is an inverted duty structure on solar products, meaning it is cheaper to import finished product than raw materials", said Ms. Mohanka.

## EXPECTED SOLAR GROWTH IN INDIA



## Future Outlook

According to a recent MNRE survey, about 5,000 trillion kWh per year energy is incident over India's land area with most parts receiving 4-7 kWh per sq. m per day. The potential for solar power has been estimated for most parts of the country at around 30 -50 MW per square kilometer of open, shadow-free area covered with solar panels/ collectors.

One such example is Tata BP Solar, who have sold 150,000 SHLS to households in the states of Uttar Pradesh, Haryana and Karnataka in the year 2009-10.