



Ultimate Solution

## Board of Directors

Mr. S.L. Agarwal, *Managing Director*

Miss. S. Jhunjunwala, *Whole time Director*

Mr. D Sethia, *Independent Director*

Mr. P. Kaushik, *Independent Director*

## Chief Financial Officer

Miss. Sima Jhunjunwala

## Company Secretary

Miss. Sweta Biyani

*(has joined as Company Secretary from 14th Feb, 2017)*

## Bankers

Invent Asset Reconstruction Company Ltd

## Auditor

M/s Agarwal Sangneria & Co.

*Chartered Accountants*

## Registered & Corporate Office

### Register Office

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Block - P, 2nd Floor,  
Kolkata – 700 053, New Alipore

Ph. No.: (033)2400-0419

Fax No.: 2400-0375,

### Corporate Office and Plant

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Falta, 24 Parganas (South), Pin - 743504, West  
Bengal, India

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Fax No.: 03174-222933.

CIN: L29307WB1990PLC048350

Email: websol@webelsolar.com

Website: www.webelsolar.com

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# Management discussion and analysis

## Global economic overview

Global growth in 2016 was estimated at 2.3% by the World Bank and projected to rise to 2.7% in 2017. Global economic growth continued to stagnate following slow trades, low investments and policy uncertainties in advanced economies. The 2016 fiscal was defined by the UK's decision to leave the EU and the election of Donald Trump as the US President.

Both of these events are expected to have long-term effects on the global economy. Consumers largely continued to spend cautiously with expenditure increasing by just 2.4% in real terms over 2015, well below the corresponding increase in disposable incomes. However, the Asia-Pacific region saw a marked increase in expenditures. Growth in emerging markets and developing economies is expected to pick up in

2017 on the back of the removal of a number of obstacles for commodity exporters and continued domestic demand for commodity importers. The main factors that could possibly weigh on the medium-term growth prospects across many emerging markets and developing economies are weak investments and sub-optimal productivity. (Source: World Bank, Euromonitor)

## GLOBAL GROWTH TRENDS

	2016	2017 (P)	2018 (P)
Global economy	3.1%	3.4%	3.6%
Advanced economies	1.6%	1.9%	2.0%
Emerging market and developing economies	4.1%	4.5%	4.8%

(Source: IMF)

## Indian economic overview

India's economic growth has been pegged at 7.1% for the current fiscal (FY 2017), down from 8% recorded in the last financial year (FY 2016). Although demonetisation impacted the national growth rate by 25-100 bps, this move is expected to translate into long-term benefits. Over the last 25 years, India's growth performance was robust, backed by policy reforms that made India open to goods and capital flows. The challenges that India faces include ambivalence about property rights and the private sector, deficiencies in state capacity, especially in delivering essential services, and inefficient redistribution of capital.

The growth rate of India's industrial sector was estimated to moderate to 5.2% in FY 2017, down from 7.4% in FY 2016. The growth rate of the industrial sector was estimated at 5.2% in FY 2016-17, down from 7.4% in FY 2015-16. The country's IIP registered

a modest growth of 0.7% for the full year FY2016-17 and 2.5% in March 2017 with 2004-05 as base year. Under the revised series with a 2011-12 base year, the Index of Industrial Production (IIP) rose 5% in the financial year and 2.7% in March.

With Rajasthan, Madhya Pradesh and Maharashtra receiving 20% more rain than the usual, the agriculture sector is expected to grow at an above-average 4% on a weak base caused by two consecutive poor monsoons. This is expected to revive weak rural demand and, by extension, national GDP growth.

(Source: Central Statistics Office)

## Outlook

The near-term growth outlook for India appears bright even as growth forecast for 2017-18 was moderated by 40 bps due to the temporary negative consumption shock induced by cash shortages and payment disruptions

associated with demonetisation. Subsequently, India's GVA growth is likely to stay at 6.6% as economic activity gradually normalizes. The proposed implementation of GST could boost interstate trade. (Source: IMF, ICRA)

## Global renewable energy overview

For the third successive year in 2016, global energy-related carbon dioxide emissions from fossil fuels and industry reported zero growth. This was largely due to moderating coal use globally, improvements in energy efficiency and increase in renewable energy utilisation.

Approximately 16% of the total global population, 1.2 billion people, live without electricity; about 38% of the global population, 2.7 billion people, do not have clean cooking facilities. Most people in rural Sub-Saharan Africa and Oceania region do not have access

to electricity and clean cooking. For 1 billion-plus people having no access to electricity, distributed renewable energy projects, especially in rural zones located far from the centralized grid, are proving to be cost-effective.

Renewable power generating capacity recorded its largest annual increase in 2016, with an estimated 161 gigawatts of total capacity addition, Total global

capacity increased to almost 2,017 GW at the end of 2016, nearly 9% compared to 2015. In 2016, renewables were estimated at nearly 62% of net global power generating capacity additions. Solar PV accounted for 47% share of the installed renewable capacity in 2016, while wind and hydropower accounted for 34% and 15.5% respectively. The growth drivers of

renewable power and its geographical expansion included a decline in renewable energy technology prices and increasing power demand in some countries.

Capacity additions	2015	2016
Renewable power capacity (total, not including hydro), Gigawatts	785	921
Solar PV capacity, Gigawatts	228	303

## Solar photovoltaics (PV) overview

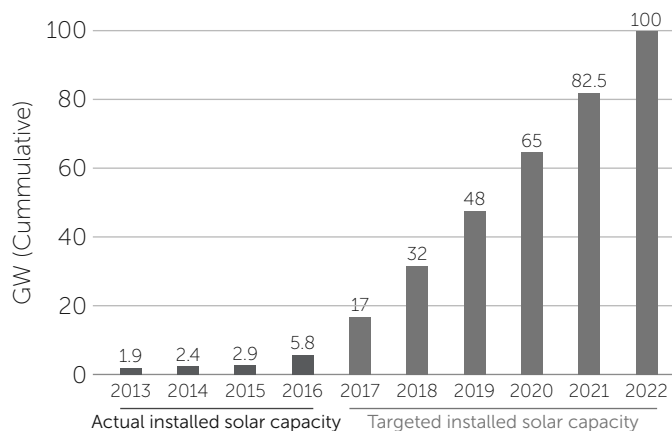
Solar PV was the leading source of additional (net of decommissioning) power generating capacity in 2016 globally. The annual market rose nearly 50% to at least 75 GWdc, equivalent to more than 31,000 solar panels installed every hour, increasing the global total to at least 303 GWdc. The top five countries, with China in the lead, accounted for 85% of the additions.

Despite high demand growth, unprecedented price reductions occurred, particularly for modules in 2016. Falling prices and rising demand attracted electrical utilities, oil and gas companies into the industry. Average module prices fell by an estimated 29%, to US\$ 0.41 per watt between the Q4 2015 and a year later, recording historic lows. Countries across the world have been using tenders in increased amounts to raise their solar generating capacity, and new record low bids were set in 2016, when bidding in some markets was below

US\$ 0.03 per kWh. Argentina, Chile, India, Jordan, Saudi Arabia, South Africa and the UAE saw low bids for solar PV in 2016 and early 2017.

At least 17 countries had solar PV capacity by 2016 end to meet 2% or more of their electricity demand. In several countries, the traditional method of energy access through grid extension alone is becoming obsolete as customer demand is driving millions of households to generate their own modern energy.

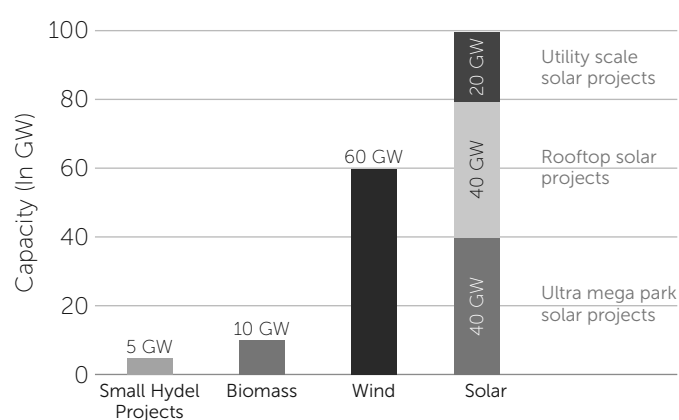
## INDIA SETS YEAR-ON-YEAR TARGET TO REACH AMBITIOUS 2022 SOLAR GOAL



Notes: FY = All years in chart are fiscal year from April 1 to march 31; 1 GW = 1,000 MW.

Source: Bloomberg New Energy Finance (BNEF); The Economic Times.

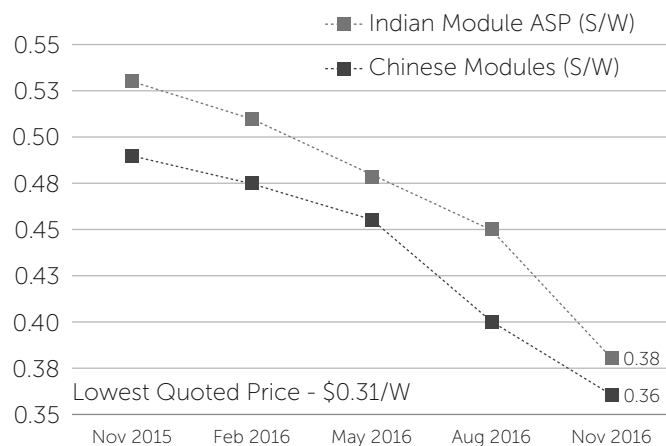
## INDIA'S 2022 RENEWABLE ENERGY TARGET



Source: Renewable Energy Policy Network Report 2016

## CHINESE MODULE AVERAGE SELLING PRICES IN INDIA ARE THE LOWEST IN THE WORLD

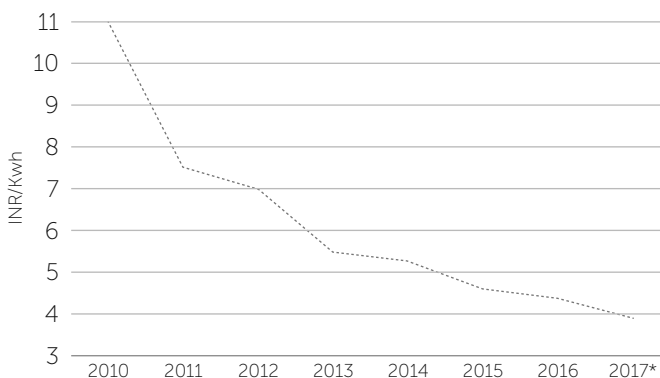
Chinese module prices in India have declined by ~30% in the last 12 months



Source: Mercom Capital Group (Dec 2016)

## COSTLY TO CUTTHROAT TARIFFS: INDIA'S SOLAR AUCTION JOURNEY

Lowest solar tariff of 2016 is less than half of the lowest in 2010

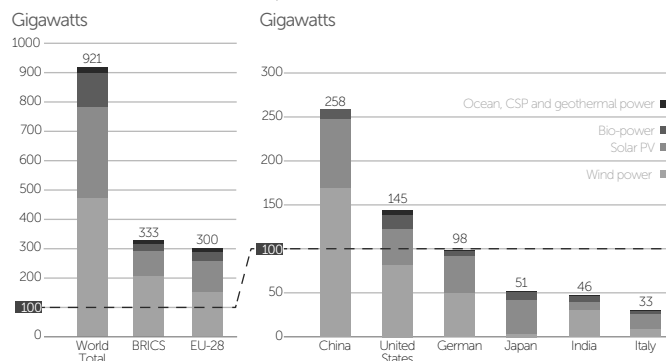


Source: Bloomberg New Energy Finance

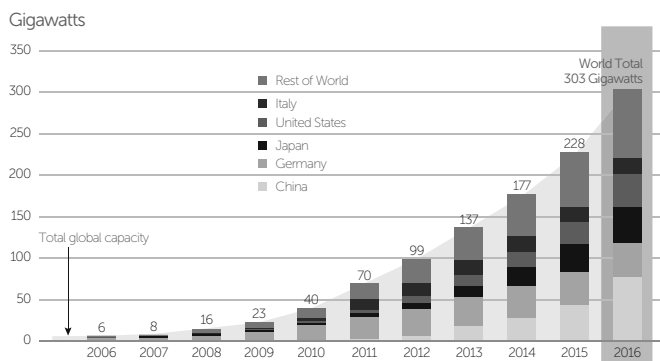
\*2017 tariff is estimated below INR 4/Kwh

## Total capacity or generation as of end-2016

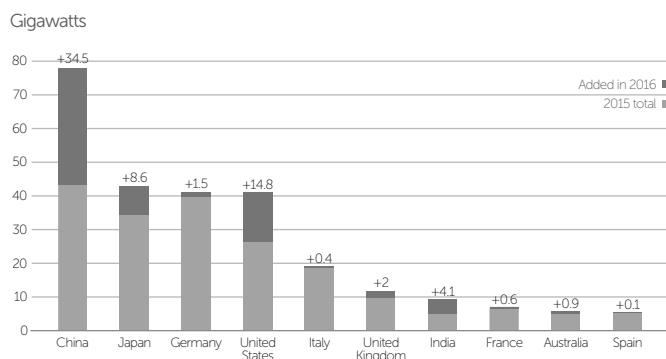
### RENEWABLE POWER CAPACITIES IN WORLD, BRICS, EU-28 AND TOP 6 COUNTRIES, 2016



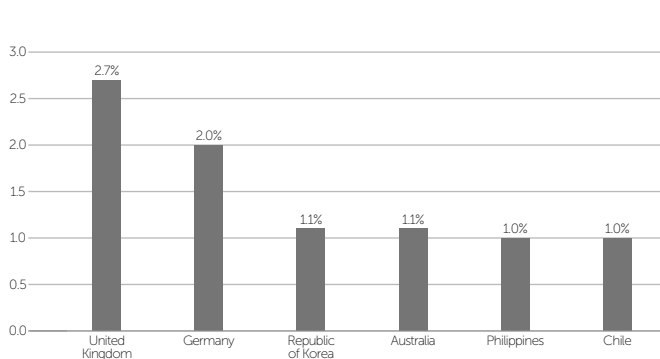
### SOLAR PV GLOBAL CAPACITY AND ANNUAL ADDITIONS, 2006-2016



### SOLAR PV CAPACITY AND ADDITIONS, TOP 10 COUNTRIES, 2016



### SOLAR PV GLOBAL CAPACITY ADDITIONS, SHARES OF TOP 10 COUNTRIES AND REST OF WORLD, 2016



In 2016, China dominated global shipments for the eighth year running. Asia accounted for 90% (and China 65%) of global module production. Although some new production capacities opened in Europe, the region's overall module manufacturing output reduced by 16%, to 2.7 gigawatts.

On balance, global production of crystalline silicon cells and modules increased significantly in 2016. Estimates of cell and module production, as well as of production capacity, differ widely; rising outsourcing and rebranding make the counting of production and shipments more complex every year. In preliminary 2016 estimates production capacity exceeded 80 gigawatts for cells (up 29% year-over-year) and 83 gigawatts for modules (up 33% year-over-year). Thin film production increased by an estimated 11%, accounting for 6% of total global PV production (declining from 8% in 2015).

Module manufacturers continued raising the number of busbars' to lower internal electrical resistance, as well as participating in the reduction of barren spaces on modules, enhancing light trapping. Efficiency gains from such advances moderated module requirements for a given capacity, reducing costs. The year saw an increased traction in hybrid projects that integrated solar PV with other renewable and energy storage technologies.

In 2016, large US and European manufacturers fought to maintain market share. As the market matured, the industry became more concentrated, and the top 10 vendors accounted for 80% of global shipments in the first half of 2016.

## Indian power sector overview

Between January and November 2016, 24,500 megawatts in generation capacity was added in India allowing the total installed capacity to cross the 300,000-megawatt in 2016. ~25,000 megawatts in generation capacity is expected to be added in 2017 with coal accounting for 60% of this capacity addition and renewables (largely solar and wind) accounting for 35%.

Some 8,500 megawatts of renewable generation capacity was added in the country between January 2016 and November 2016 – the highest for any calendar year, currently accounts for ~19% of the total installed renewable power capacity in the country.

For the first time in the Indian power sector's history, energy deficit fell below the 1% mark, a significant achievement. Between January 2016 and October 2016, energy requirement stood at 962.1 billion units while availability stood at 952.5 billion units – a deficit of around 1% – the lowest ever in the country's history. During 2016, peak demand stood at 159,500 megawatts in September while peak deficit in that month stood at 1.6% – the lowest ever for any calendar year.

Consistent capacity addition and flattish growth in power demand helped India's cause. The Ujwal Discom Assurance Yojana has been one of the most talked-about schemes related to the Indian power sector. The scheme has been designed in such a way so as to strike at the heart of the issues affecting the sector – the inefficient operation of power distribution companies. As per the report of the ministry, of the 16 states that are a part of the scheme, at least eight have a lower gap between their average cost of electricity supply and average cost of realisation and about 12 states have reduced their AT&C loss levels. If successfully implemented, this policy can permanently solve the longstanding issues of the distribution sector and revive energy demand of the country.

Under the Deen Dayal Upadhyay Gram Jyoti Yojana's rural electrification package, measures were taken up in mission mode starting August 2015 with a target to electrify un-electrified villages of the country by May 2018, to fit into the grander plan of '24x7 Power for All' by 2019. As per GARV dashboard, of the 18,452 villages to be electrified, electrification has already been completed for 11,434 villages. Electrification needs to be carried out in 6,320 villages while the remaining 698 villages are uninhabited. Other than the aforementioned policies, few others like New Tariff Policy, Wind Re-powering policy and Wind Solar Hybrid Policy, among others were announced in 2016 which will catalyze the growth of the sector. (Source: Economic Times)

## Indian solar power market

Globally, renewable energy has gained massive traction. Apart from the conventional markets, a number of new markets have opened up like Eastern European, South East Asian and Latin American nations as well as Portugal and Spain, among others. Consequently, the Indian solar power market is expected to capitalize and grow exponentially.

In this context, the decisive policies undertaken by the Central Government (raising the solar power capacity to 100 gigawatts by 2022 from 10 gigawatts presently) is expected to serve the sector in good stead. The country added 5 gigawatts of capacity in FY2016-17, which was equal to the entire solar capacity of the country at the beginning of the fiscal. Figures released by the Central Electricity Authority show that the Indian solar energy sector generated >10 billion units of electricity for the very first time in January 2016. During the April 2016-January 2017 period, solar power plants in India generated more than 10,565 million kilowatt-hours of electricity – roughly twice (5,726 million kilowatt-hours) as much as it did in the corresponding period

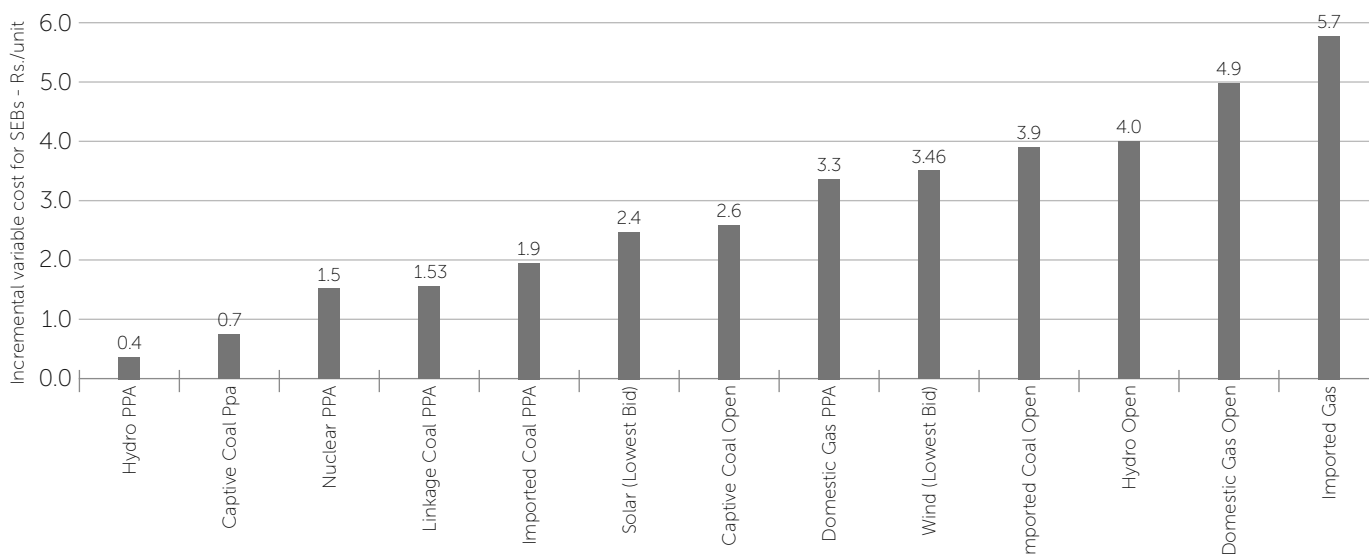
last year, albeit on a higher installed capacity base. However, it still amounts to a mere 1% of the total power generated in the country during that period. With the country slated to add >10 gigawatts during FY2017-18, it could emerge as the third-largest solar energy player in the world after the US and China.

This upsurge in capacities has transpired on the back of various government bodies like Coal India, Neyveli Lignite, Metro Railways, Indian Railways and Airports Authority of India deciding to adopt solar power in a larger way. Moreover, with the world becoming progressively warmer with each passing year, several international governments are trying to figure out ways and means to reduce greenhouse gas emissions. In view of this, solar

power has emerged as a beacon of hope. A typical 500-megawatt coal-fired power plant annually emits 3.7 million tonnes of carbon dioxide, equivalent to chopping down 161 million trees. Hence, the need of the hour is to reduce dependence on fossil fuels and go green as soon as possible.

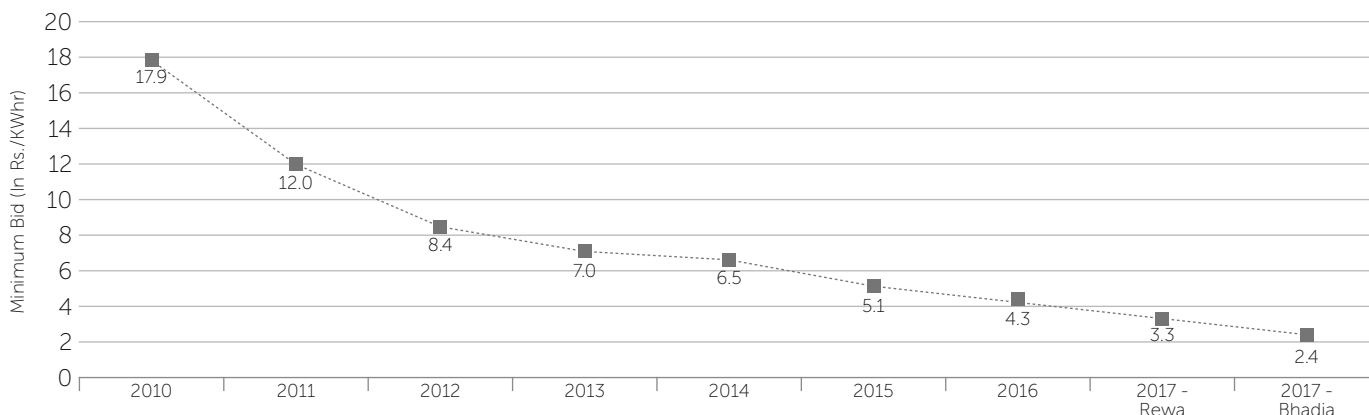
[Source: powermin.nic.in, Financial Express, World Bank, Livemint]

## COST COMPETITIVENESS OF VARIOUS SOURCES OF POWER



Note: Based on incremental cost approach | Source: MNRE, PIB, I-Sec research

## SOLAR BIDDING TREND



Source: SECI, MNRE, I-Sec research

# How solar energy has grown in scope and scale

12.3

India's Solar capacity installations, 2017 (in GW)

100

India's projected solar energy capacity, 2022 (in GW)

4.1

India's share of the global solar energy sector in 2017 (in %)

14

India's projected share of the global solar energy sector, 2022 (in %)

3

India's global ranking in terms of solar energy sector growth, 2017

2

India's global ranking in terms of solar investment attractiveness, 2017

39

Capacity of India's under-construction CSP facilities (in MW)

0.9

Capacity addition in India's solar thermal heating and cooling market during 2016 (in GWth)

12.76

Indian solar tariff, 2011 (in Rs./KwH)

2.44

Indian solar tariff, 2017 (in Rs./KwH)

1247

Indian rooftop solar capacity, 31 March 2016 (in MW)

40

Indian estimated rooftop solar capacity, 2022 (in GW)

58

India's projected renewable energy capacity, FY18 (in GW)

22

India's projected solar energy capacity, FY18 (in GW)

1.468

Solar cells installed capacity (in gigawatts)

5.648

Solar modules installed capacity (in gigawatts)



## Indian solar power market investments

The World Bank approved a \$625 million loan that will support the Government of India's grid-connected rooftop solar programme by financing the installation of solar panels on rooftops across India. It also approved additional loans worth US\$100 million to help India increase its power generation capacity through cleaner sources.

Recently Warburg Pincus invested \$100 Million in Cleanmax Solar, India's largest rooftop solar developer, which accounts for India's quarter market in roof top solar installation.

The Shared Infrastructure for Solar Parks project will establish large solar parks and support the Government of India's plans to install 100 gigawatts of solar power out of a total renewable-energy target of 175 gigawatts by 2022.

The International Finance Corporation, the World Bank Group's private sector arm, is supporting the Indian state of Madhya Pradesh set up a 750-megawatt ultra-mega solar power project in Rewa, the largest single-site solar power project in the world. IFC will help structure and implement the transaction to help attract investments of about \$750 million.

(Source: World Bank, IBEF)

## Government initiatives

- In 2009, MNRE launched Jawaharlal Nehru National Solar Mission with the ambitious goal of making India a global leader in solar energy. It plans to achieve grid parity (same production cost as current electricity source) by 2022 and parity with coal-based power generation by 2030.
- The National Tariff Policy for Electricity was amended by the Union Government in January 2016 to achieve the objectives of UDAY scheme. In order to promote use of renewable energy, a solar renewable purchase obligation was proposed to be increased to 8% by 2022.

- The Government of India announced a massive renewable power production target of 175,000 megawatts by 2022. This comprises generation of 100,000 megawatts from solar power, 60,000 megawatts from wind energy, 10,000 megawatts from biomass, and 5,000 megawatts from small hydro power projects.

- The Government of India plans to set up a US\$ 400 million fund, sourced from World Bank, for the protection of renewable energy producers from payment delays by power distribution firms, while protecting the distribution firms from the shrinking market for conventional grid-connected power, caused by wider adoption of rooftop solar power generation.

- The Ministry of New and Renewable Energy, which provides 30% subsidy to most solar-powered items such as lamps and heating systems, has extended its subsidy scheme to refrigeration units.

- The Ministry of Shipping plans to install 160.64 megawatts of solar and wind-based power systems at all major ports by 2017.

- The Government of India has initiated various programmes in the urban sector for promoting solar energy usage via the deployment of SPV devices in urban areas, establishment of Akshya Urja shops and solar-powered buildings.

- The Solar City aims at minimum 10% reduction in projected demand of conventional energy at the end of five years. Up to ₹50 lacs per city is provided depending upon population and initiatives decided to be taken by the city administration.

(Source: MNRE, Union Budget, Economic Times)

## Budgetary initiatives

Solar power continued to be the focal point of the Union Budget 2017-18, with the Budget split being ₹3,361 crores for solar and only Rs 408 crores for wind. The 2017-18 Budget allocation to the MNRE of Rs. 5,473

crores saw a slight spike from the allocation in 2016-17. The Union Budget 2017-18 also announced support for the second phase of solar park development for an additional 20,000-megawatt capacity and the powering of 7,000 railway stations with solar power.

Finance, one of the greatest impediments to the advancement of the renewable energy sector, received attention in the 2017-18 Budget. Foreign investment in the sector may also see a spurt of growth due to the extension of the applicability of the concessional withholding tax rate of 5% being charged on interest earned by foreign entities in external commercial borrowings or in bonds and government securities to 2020 from 2017. This benefit has also been provided to masala bonds, rupee denominated bonds introduced by the Reserve Bank of India in September 2015. Masala bonds are an effective means of raising international capital for renewable energy projects at preferential rates without developers bearing any foreign exchange risk.

On the manufacturing front, the key takeaway from the Budget was the nullification of basic customs duty for tempered glass used in the manufacture of solar cells, panels and modules and the reduction of countervailing duty from 12.5% to 6% for parts used in the manufacture of tempered glass which is used in solar PV cells, modules, among others. This, together with the incentive of reduction of income tax payable by companies with an annual turnover of ₹50 crores to 25%, could provide a impetus to the domestic solar sector. The Central Government has also laid a keen emphasis on skill development by setting up various centres across the country and increasing funds towards skill development programmes.

(Source: Firstpost)

## Sectoral growth drivers

**Government impetus:** The Government of India set itself a target of adding 175 gigawatts of renewable power by 2022. The Union Budget outlined measures to support the development of solar capacity, embarking on the second phase of solar park development for an additional 20,000 megawatts of capacity and the installation of 1,000 megawatts of solar capacity at railway stations.

The Indian Government offers several tax and financial incentives to support the rooftop solar market including a 30% subsidy for residential and institutional consumers, 80% accelerated depreciation, 10-year tax holiday (MAT payable) and \$1.5 billion funding from World Bank, ADB and KfW.

(Source: *Solartoday, Economic Times*)

**Increasing consumption:** India's energy consumption is set to grow 4.2% a year by 2035, faster than that of all major economies in the world, according to BP Energy Outlook. India, Asia's second biggest energy consumer since 2008, had in 2015 overtaken Japan as the world's third-largest oil consuming country behind the US and China.

(Source: *BP Energy Outlook*)

**Growing economy:** India is a fastest-growing developing economy in the world. Increasing prosperity, growing urbanisation and rising per capita energy consumption has led to an increased energy demand.

**FDI reforms:** The Central Government allowed 100% FDI in the power sector. Around 293 global and domestic companies committed to generate 266 gigawatts of solar, wind, mini-hydel and biomass-based power in India over the next decade. The initiative would entail an investment of about US\$ 310–350 billion. Between April 2000 and December 2016, the industry attracted US\$ 11.4 billion in FDI.

(Source: *IBEF*)

**Adequate resources:** India is home to one of the most abundant solar resources in the world, with 2.97 million square kilometres of tropical and subtropical land and an average of 250–300 clear sunny days a year. Solar power offers a significant potential to meet a large share of the country's energy needs using centralized and decentralized production. The solar energy potential in India is immense due to its convenient location near the Equator. India receives nearly 3,000 hours of sunshine every year and can generate over 1,900 billion units of solar power annually, which is enough to service the entire annual power demand even in 2030 (estimates). Rajasthan and Gujarat enjoy maximum solar energy potential. This, coupled with the availability of barren land, increases the feasibility of solar energy systems in these regions.

(Source: <http://www.worldwatch.org/node/6122>)

**Lowered tariffs:** The trigger for acceptability of solar power has been its falling tariffs due to the lower cost of raising finances, and declining solar module prices. Solar tariffs declined from Rs10.95–12.76 per kilowatt-hours in 2011 to ₹4.34 per kilowatt-hours last year. Solar tariffs dipped to a new low of ₹2.44 kilowatt-hours at the Solar Corporation's 2017 auction. This attractively lower than the average price of ₹3.20 per unit charged by India's largest generation utility NTPC for electricity generated by its coal-fired plants.

(Source: [www.livemint.com](http://www.livemint.com))

**Growing awareness:** India suffers persistent energy shortage with average demand-supply gap revolving around 12% of total power supply. This, coupled with rising energy needs, is a major factor driving the growth of this segment. The Power Ministry forecasts electricity consumption to increase from around 1,900 kilowatt-hours presently to around 1,900 kilowatt-hours by 2032. Increasing public awareness about issues such as energy scarcity and environmental preservation could catalyze the demand for

eco-friendly power. Moreover, the buyer's perception has shifted from conventional sources of power to renewable equivalents. Over the years, solar panels have become increasingly affordable.

(Source: *International Journal of Emerging Research in Management & Technology*)

**Smart Cities:** In January 2016, the Indian Government announced a list of 20 cities to be developed into Smart Cities – advanced urban cities with well-connected infrastructure and communications through data centres and automated networks. India is expecting to develop 98 such cities, model townships for a sustainable and ultra-modern lifestyle. It has already been mandated that 10% of the smart cities' energy requirement would come from solar energy and at least 80% buildings to be energy-efficient and 'green'. With a plan to develop approximately 100 such cities, the rate of renewable energy usage will only increase.

(Source: <http://www.greenworldinvestor.com>)

## Factors driving a decline in solar power costs

**Module price drop:** Global PV module price fall has been accelerated by softness in commodity prices and large over-capacity (as China achieved majority of its FY17 solar capacity addition target in the first half of the year itself, leaving PV manufacturers with a large under-utilized production capacity that made it possible to dump in other countries). PV module prices declined ~29% YoY, inverter prices 21% YoY and EPC costs 22% (around 30% of overall cost of a solar project) accelerating the decline.

**Financing cost decline:** Cost of financing solar power has declined, particularly in India, as the RBI reduced benchmark rates and multilateral lending agencies like the World Bank extended into this sector.

**Operational improvements:** The installation of sun-trackers, better project design and lower EPC expenses