

# Renewable Energy Monitor

January 2016

## Policy/ Initiatives



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- Increase in renewable energy use to boost global GDP by \$1.3 trillion
- GST likely to impact renewable energy sector: Ministry report
- Renewable energy investments in India touch \$10.9 billion on solar surge
- Government mulling to bring large hydropower units under renewable energy ambit.

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- Union Government to benchmark solar tariff lower
- Govt approves Rs 5050 crore funding to push solar projects
- Discoms take to green power in Delhi
- Suzlon enters solar power business
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- **Trichy railway division gets biodiesel engine**
- **Micro industrial complex set up in Rajasthan village**
- **IIT-Roorkee scientists patent low-cost biofuel tech**

## Policy

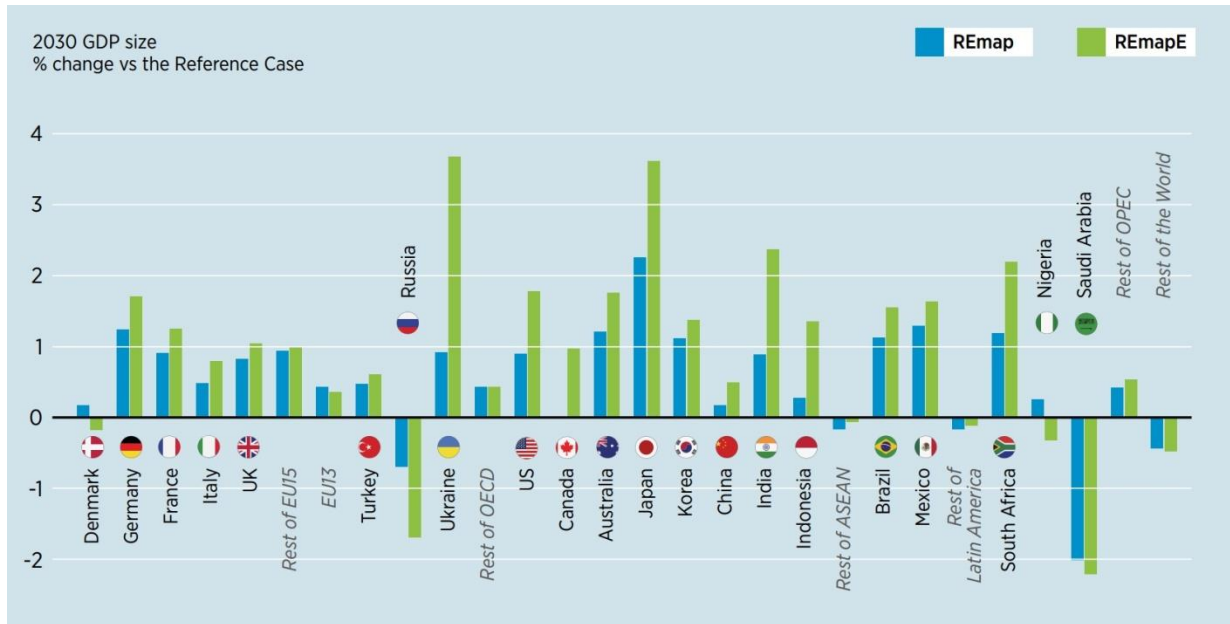
**India to save \$6 billion per annum after switching to LED by 2018.** The government's decision to switch over to LED bulbs by 2018 under the energy efficiency mission would result in saving of up to USD 6 billion per annum, Union Minister of State with Independent Charge for Power, Coal, New and Renewable Energy in the Government of India Mr Piyush Goyal said at the Harvard College US India Initiative Conference in Mumbai. Under the [Domestic Efficient Lighting Programme](#) (DELP), nearly 4.59 crore LED bulbs have been distributed so far.

The Centre has set a target to distribute over six crore LED bulbs through state-run Energy Efficiency Services (EESL). The minister further said the LED programme was being implemented on a mission mode and the state-run Energy Efficiency Services Ltd (EESL), has been successful in bringing down the price of LED bulb to a quarter of what it was priced a year and a half ago. The government is working with utmost transparency and people can now check in real time how many villages are electrified, using the specially created app 'Garv Grameen Vidyutikaran'.

**Increase in renewable energy use to boost global GDP by \$1.3 trillion.** The [report](#), *Renewable Energy Benefits: Measuring the Economics* from the International Renewable Energy Agency (IRENA) provides the first quantification of the macroeconomic impact of doubling the global share of renewables in the energy mix by 2030. The study builds on IRENA's previous work on the socio-economic benefits of renewable energy, as well as on REmap 2030, IRENA's roadmap for doubling the global share of renewables.

Using a macro-econometric approach, the report takes into account the linkages between the energy system and the world's economies within a single quantitative framework. The analysis compares a business-as-usual case to two cases of advanced renewable energy deployment. The study shows that the impact of a transition to 36% renewables would benefit economic growth (GDP), welfare and employment in both cases. Doubling the share of renewables in the energy mix by 2030 would increase global GDP by up to 1.1 per cent, improve welfare by up to 3.7 per cent and support over 24 million jobs in the sector.

{Figure 3: GDP impacts (2030 GDP size, % change vs the Reference Case) 18}

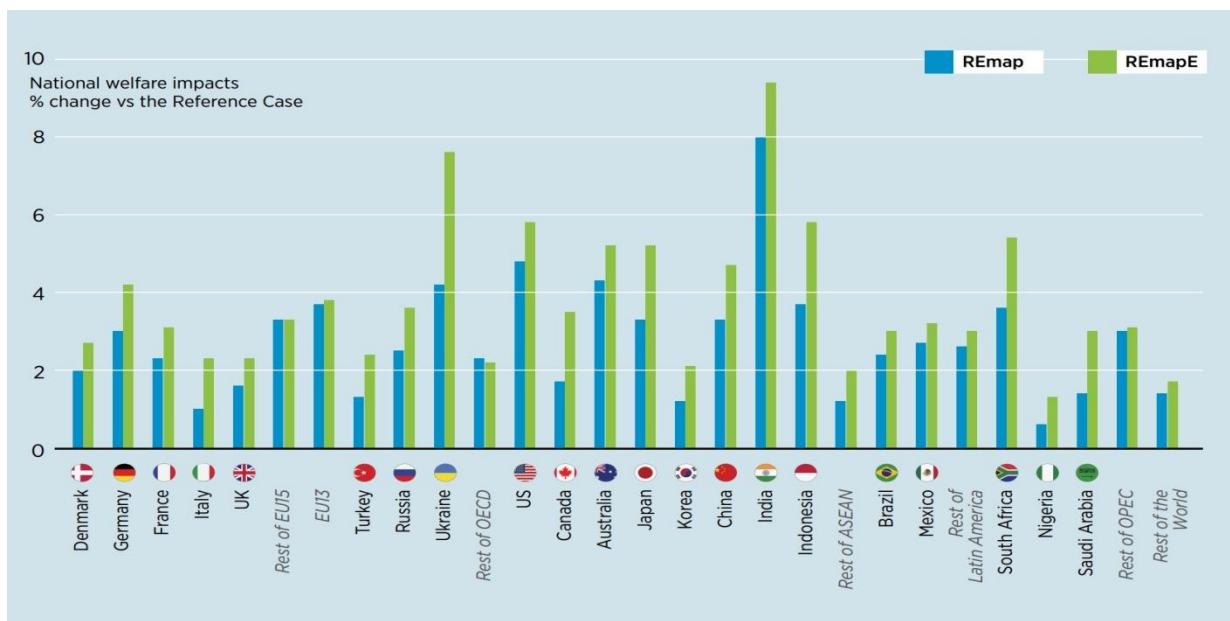


The REmap scenario doubles renewable energy, while REmapE doubles renewable energy with a focus on electrification

(Source: [Renewable energy benefits: measuring the economics by IRENA 2016: 26p](#))

“The recent Paris Agreement sent a strong signal for countries to move from negotiation to action and rapidly decarbonise the energy sector,” said Adnan Z. Amin, IRENA Director-General. “This analysis provides compelling evidence that achieving the needed energy transition would not only mitigate climate change, but also stimulate the economy, improve human welfare, and boost employment worldwide.” More importantly, however, the report clearly shows that increasing renewable energy deployment by such levels would have a massive impact on a range of social and environmental issues — specifically, the report concludes that the impact of renewable energy deployment on welfare is estimated to be three to four times the impact it has on GDP, with global welfare increasing by as much as 3.7%.

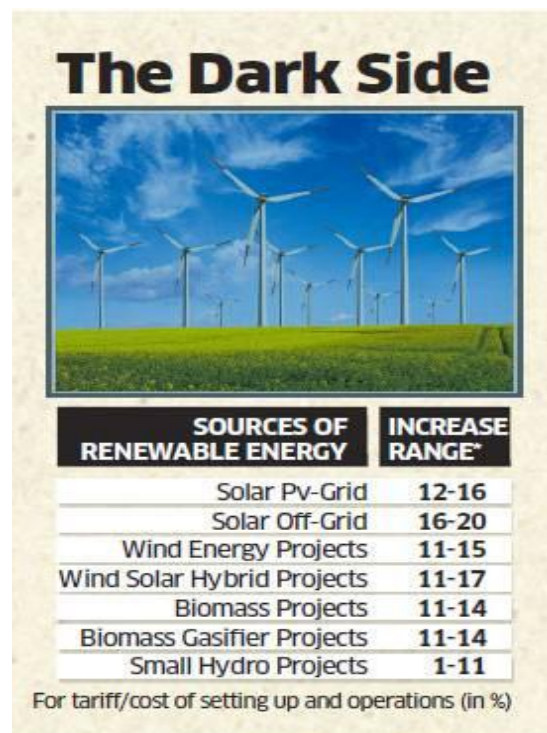
{Figure 4: National welfare impacts (% difference from the Reference Case) }



(Source: [Renewable energy benefits: measuring the economics by IRENA 2016: 35p](#))

Employment, also, would benefit, with renewable energy jobs increasing from 9.2 million global jobs currently, to more than 24 million by 2030. Furthermore, increases in global renewable energy deployment would not only impact the use of fossil fuels, but would also begin impacting global trade patterns — more than halving global imports of coal, reducing oil and gas imports, and benefiting large fossil fuel-importing nations and regions such as Japan, India, Korea, and the European Union as a whole.

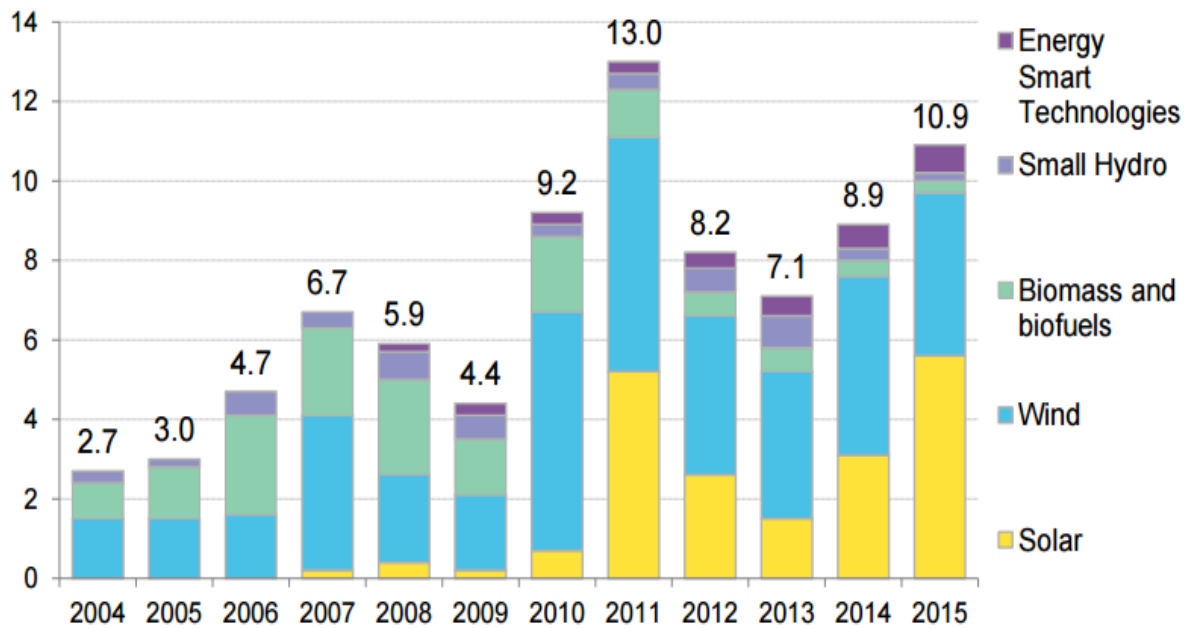
**GST likely to impact renewable energy sector: Ministry report.** The latest findings reveal that the new GST regime could increase the cost of setting up renewable energy systems in the country by up to 20%. The Ministry of New & Renewable Energy (MNRE) is learnt to have shared the findings of the report with the Department of Revenue, requesting an exemption. The latest findings from a study commissioned by the ministry have revealed that the implementation of the GST will increase the cost of setting up of all categories of renewable energy systems from solar to wind to biomass to small hydro power projects.



(Source: *Economic Times*)

The renewable energy sector currently enjoys various fiscal incentives like 100% tax holiday on the earnings for 10 years, concessional excise and custom duties and so on. All these incentives will come to an end in the new GST regime. Concerned that the indirect tax reform through the GST could hike renewable energy costs and pricing and hit investors, the MNRE had commissioned a study to assess the same. The key factors resulting in an adverse impact on the cost of renewable energy are removal of exemption, increase in tax rates and removal of statutory norms. The ministry has argued that a sudden increase in cost would lead to policy disruption, scare away new investors and also make it difficult to retain existing investors.

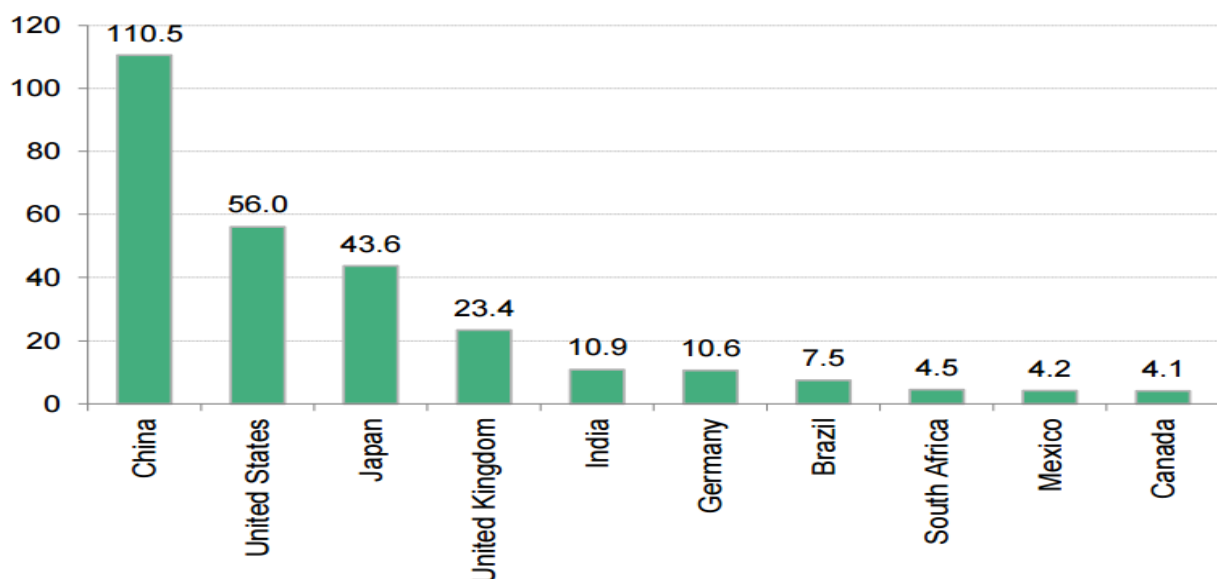
**Renewable energy investments in India touch \$10.9 billion on solar surge.** Investments in clean or renewable energy in India have touched \$10.9 billion on solar surge against an annual average of \$8 billion in the last three years, according to Bloomberg New Energy Finance. Solar PV investment

**Figure 1: Total renewable energy investments in India (\$bn)**

Source: Bloomberg New Energy Finance

leaped ahead of wind investments for the first time during the year due to a strong policy push for power from the sun.

The increase in investment in India's solar sector was 80 percent to \$5.6 billion in 2015 from \$3.1 billion last year. Solar investments have risen for the third year in a row propelled by allocation of 11GW of capacity in 2015 to independent power producers through multiple federal and national-level programs.

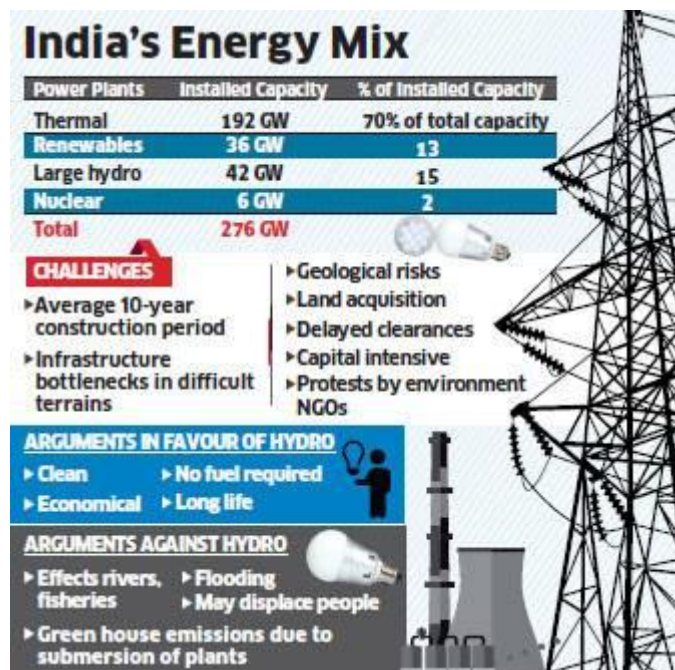
**Figure 2: Top ten countries ranked by renewable energy investments in 2015 (\$bn)**

Source: Bloomberg New Energy Finance

Investments in wind have stayed relatively flat at \$4.1 billion in 2015, which is also the average achieved in the last three years. The government has set a target of 100GW of solar capacity and 60GW of wind power by 2022. A slight increase in financing was observed in energy smart technologies which include smart grids and smart meters. Bloomberg New Energy Finance expects

clean energy financing to touch record numbers in the next two years beating the previous best of \$13.1 billion in 2011. India ranks the fifth largest country by financing in 2015 narrowly overtaking Germany and behind China, United States, Japan and United Kingdom.

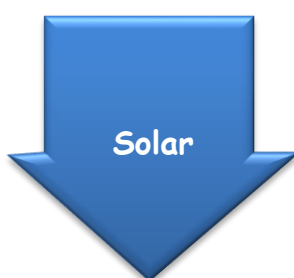
**Government mulling to bring large hydropower units under renewable energy ambit.** The government is mulling to bring big hydropower plants under the ambit of renewable energy, giving the capital-intensive projects access to international funds and benefits available to green power, besides raising carbon-free generation of electricity as committed by India in UN climate talks. Power industry experts see this as a shot in the arm for hydropower projects, which will not only get more capital but also find it easier to sell power as state power distribution companies are obliged to purchase some power from renewable sources.



(Source: *The Economic Times*)

The move, however, may face resistance from environmentalists who argue that though hydropower plants do not pollute the air, they impact fisheries by altering the natural course of rivers, cause flooding and emit green house gases due to submersion of plants. The Supreme Court had stalled work on 24 hydropower projects in Uttarakhand on allegations that they led to catastrophic floods in June 2013.

[The Economic Times](#), 10 January 2016 | [The Economic Times](#), 12 January 2016 | [Greentech](#), 14 January 2016 | [The Hindu](#), 18 January 2016 | [The Economic Times](#), 18 January 2016



**Union Government to benchmark solar tariff lower.** Closing the pricing gap with conventional power, the Union government is planning to benchmark solar tariff at Rs 4.5 a unit. This would be the reference price for solar power projects, over and above which companies would bid for viability gap funding (VGF) from the government.

## GAINING MOMENTUM

- Falling solar rates pushes govt to benchmark tariff at historic low of Rs 4.5 per unit
- Solar project developers to compete for VGF amount
- Source of VGF is yet to be decided
- Move comes in the wake of constantly falling solar tariffs
- Lowest bid was Rs 4.63 per unit

The move comes in the wake of constantly falling tariffs in competitive bidding for solar power projects. The last bidding for solar power park of 500 megawatt (Mw) in Andhra Pradesh witnessed the lowest bid of Rs 4.63 per unit by US solar company SunEdison. Japan's SoftBank through its joint venture in India SBG Cleantech won 350 Mw solar power project in the same state at the same tariff. The Central Electricity Regulatory Commission (CERC) would clear the benchmarking of tariff. The new norm would provide buyers a stable tariff regime. Solar power project developers would bid for VGF requirement and the bidder with minimum VGF requirement would be selected. This time around, the government is planning to award majority of projects through the VGF mode to stabilise the market, said officials. Modalities on the funding are yet to be worked out.

CLOSING THE PRICING GAP				
State	Year	Capacity (mW)	Winning bid (₹/mW)	
Madhya Pradesh	Jun '15	300	5.05	
Telangana	Aug '15	500	5.49	
Telangana	Aug '15	1,500	5.17	
Punjab	Sep '15	500	5.09	
Andhra Pradesh	Nov '15	500	4.63	

Source: Ministry of New and Renewable Energy

**Govt approves Rs 5050 crore funding to push solar projects.** The government on 20 January 2016 approved a 'viability gap funding' (VGF) of Rs 5,050 crore for setting up over 5,000 MW of grid linked solar power projects under the Jawaharlal Nehru National Solar Mission. The Cabinet Committee on Economic Affairs has given its approval for setting up over 5,000 MW of Grid-Connected Solar PV Power Projects on build, own and operate basis. It will be implemented by Solar Power Developers (SPDs) with VGF under Batch-IV of Phase-II of the JNNSM. The total investments expected under the scheme are about Rs 30,000 crore. It said that the estimated requirement of funds to provide VGF for 5,000 MW capacity solar projects is estimated to be Rs 5,050 crore (Rs one Crore/MW).

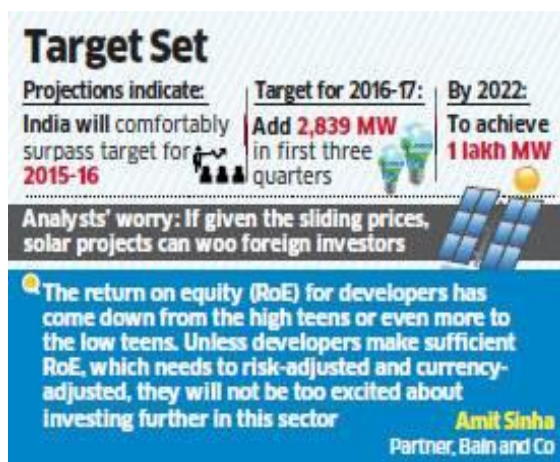
This includes handling charges to Solar Energy Corporation of India (SECI) at the rate of one per cent of the total grant disposed and Rs 500 crore for payment security mechanism for all three VGF schemes of 750 MW, 2000 MW and 5000 MW. The upper limit for VGF will be Rs 1 crore per MW. In case there is savings in the total VGF requirement, quantum of capacity of 5000 MW can be enhanced. Under the scheme 500 MW capacity will be created this fiscal while during four financial year from 2016-17 to 2019-20, solar power generation capacity of 1,125 each year will be set up.

**Discoms take to green power.** The Delhi Electricity Regulatory Commission (DERC) had notified regulations in 2012 that made Renewable Purchase Obligations (RPO) compulsory for all discoms in the city. Power distribution companies in the national Capital have finally begun to take their Renewable Purchase Obligations (RPOs) seriously. After Tata Power procured 400 MW of solar power, Reliance Infra-backed BSES announced its plans to procure 700 MW of 'green energy' for the city. BSES, which distributes power to 70 per cent of the areas in Delhi, has decided to procure both solar and non-solar power at under Rs. 5 per unit through the "reverse auction" route to ensure an "extremely competitive" rate to benefit consumers. Claiming it to be the "largest private sector green bid in India" under guidelines of the Ministry of New and Renewable Energy (MNRE), the company said its initial procurement plan was around 700 MW. Peak demand for Delhi ranges between 5,500 to 5,800 MW. Last year in May, Tata Power (TPDDL) had announced that it would procure 400 MW of solar power over three years.

**Wind turbine manufacturer Suzlon enters solar power business.** Suzlon has announced its foray into solar power with projects of 210 MW in Telangana. Suzlon won projects from the Southern Power Distribution Company of Telangana (TSSPDCL) via a competitive bidding process. This consists of six different capacity projects across the state and will be commissioned in FY17. These solar projects will be built under six different special purpose vehicle (SPVs), of which one is an existing subsidiary of Suzlon, while the rest have been acquired (by acquiring 100% shareholding).

These include Amun Solarfarms Private, Avighna Solarfarms Private, Prathamesh Solarfarms Private, Rudra Solarfarms Private and Vayudoot Solarfarms Private. The acquired companies do not have any operations or assets currently and are acquired primarily to be used as SPVs for the proposed solar projects. The acquisitions have been made at face value. Suzlon will sign six power purchase agreements (PPAs) in January 2016 with state utilities for a 25-year period. It will leverage its end-to-end clean energy solutions expertise to oversee the solar project from concept to commissioning.

**India to add 2,000 MW solar power capacity in Jan-Mar 2016.** The major projects expected to be completed in these three months are in Andhra Pradesh, Telangana, Tamil Nadu and Madhya Pradesh. These projections by solar Consultancy Bridge to India indicate that the country will comfortably surpass its target of 2,000 MW of solar projects for 2015-16.



(Source: The Economic Times)

Already around 1,100 MW have been added in the nine months to December 2015. The target for 2016-17 is much stiffer at 12,000 MW. In the first three quarters up to December, India is expected to



add another 2,839 MW of capacity. This means that over 9,000 MW will have to be added in the last quarter if the target is to be met. The majority of projects completed during the year will be in the five southern states. India wants to achieve 1 lakh MW of solar power by 2022.

**Leading air-conditioning firm Blue Star plans solar-powered ACs with IIT-M help.** The company will work on developing solar-powered air-conditioners (ACs) and indigenising controls and other parts used in inverter ACs as part of its collaboration with [IIT-Madras](#). Blue Star was among 25 companies that entered into memorandums of understanding (MoUs) with 25 of the top Central institutions in the country a couple of months ago. The collaboration meant for research requirements, curriculum development, faculty exchange and student internships, among others. The company will also look at indigenisation of components for inverter range of ACs, a fast growing category for the company in the room AC segment.

**France commits €300 million for solar energy.** French President Francois Hollande committed €300 million (around \$325 million or Rs. 2,200 crore) over the next five years for the global development of solar energy and said the real challenge was to attract investments worth a trillion dollars to promote the renewable source. Through this solar alliance, the French President said, he would like to open a new chapter to help give countries with no resources other than the sun an opportunity to produce electricity for meeting the needs of most of their people. The International Solar Alliance, envisaged to bring together 122 countries that lie wholly or partly between the Tropic of Cancer and the Tropic of Capricorn, is an initiative announced by Mr. Modi at the COP 21 Summit in Paris in November 2015.

**Solar panels for 10,000 houses cleared in Tamil Nadu.** To bring down pollution levels and make cities clean and green, the Ministry of Urban Development on 25 January 2016 cleared the installation of solar panels on the rooftops of 10,000 houses in Tamil Nadu. The beneficiaries of this programme would be those households that belong to the economically weaker segments. With an estimated cost of Rs. 253 crore under [Prime Minister's Awas Yojana](#), the proposal for such an infrastructural upgradation had come from the Tamil Nadu government and it has now been approved by an Inter-Ministerial Central Sanctioning and Monitoring Committee (CSMC) chaired by Housing and Urban Poverty Alleviation Ministry (HUPA) Secretary Ms Nandita Chatterjee.

According to the Ministry of Urban Development, the development is “a first of its kind.” “Unit Cost of greening these 10,000 EWS houses in 157 Town Panchayats is estimated to be Rs.2.53 lakh per house. Of this, Ministry of HUPA will provide an assistance of Rs.1.50 lakh per house. As per the agreement with the ministry, the State government will contribute Rs.60,000 and the beneficiary’s contribution will be Rs. 43,000.

**Maharashtra approves solar energy policy, offers incentives for power generation.** Maharashtra Government approved an energy policy that seeks to provide sops for solar power generation and encourages public and private entities to tap this renewable source of electricity in a big way. State Cabinet cleared the solar off-grid policy which aims to save at least 500 megawatts (MW) in the next five years. Urban civic bodies and sanctioning authorities have been asked to change Development Control (DC) rules to ensure construction permission is given to only those buildings, which give the undertaking to set up solar water heater panels.

[Business Standard](#), 7 January 2016 | [The Hindu](#), 7 January 2016 | [The Financial Express](#), 14 January 2016 | [The Economic Times](#), 15 January 2016 | [The Hindu](#), 25 January 2016 | [The Hindu](#), 26 January 2016 | [The Hindu](#), 26 January 2016 | [DNA](#), 26 January 2016



**Inox Wind takes over Vinirrrmaa Energy Generation in India.** The transaction was implemented by Inox Wind Ltd wholly-owned unit. [Inox Wind Infrastructure Services Ltd](#) this acquisition is a part of its continued expansion in India's southern states. It gave no further details. In December 2015, Inox Wind bought Sarayu Wind Power (Tallimadugula) Pvt Ltd, which operates in Andhra Pradesh state.

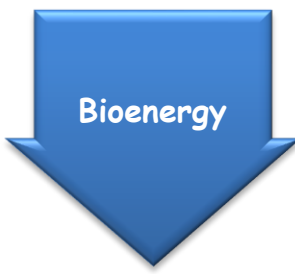
**PTC India arm awards 30 mw wind energy project to Gamesa India.** PTC India arm, PTC Energy, has awarded an order to Gamesa India for a 30 mw wind energy project in Madhya Pradesh. Gamesa will develop the entire infrastructure needed to operate the project with the supply, erection and commissioning of 15 units of 2 mw turbines, specially designed for low wind sites in India. As a part of the contract, Gamesa has also entered into a long term operations and maintenance agreement for the project. The project will be commissioned by March 2016.

**India imposes anti-subsidy duty on China-made wind castings.** India has imposed an anti-subsidy duty of 13.44% on castings made in China for wind energy generators, the Directorate General of Anti-Dumping and Allied Duties (DGAD) said. This is a move Indian castings manufacturers have been encouraging for a long time, Mr K Kasthurirangaian, chairman of the Indian Wind Power Association, told local media KNN. He explained that wind turbine makers prefer buying castings from China probably due to lower prices. In its announcement, DGAD says that the subsidisation of China-made castings has hurt the domestic industry and for this reason it has recommended imposing a definitive countervailing duty on imports of such goods from the Asian nation.

**French firm EDF invests \$169m in Indian wind energy firm SITAC RE.** France-based [EDF Energy Nouvelles](#) (EDF EN) has invested €155 million (\$168.5 million) in New Delhi-based wind energy company [SITAC RE Pvt Ltd](#). SITAC mainly focuses on the development, financing, construction, ownership and operation of utility-scale wind energy projects in India. This new partnership strengthens EDF Energies Nouvelles' position in the Indian market. Since first establishing a presence in 2013 through ACME Solar its 25 percent-owned local subsidiary dedicated to solar PV, EDF Energies Nouvelles has commissioned 180 MW in total solar capacity and is building 132 MW in projects in Uttar Pradesh and Telangana, the company said. The JV is meant for developing four projects with a total installed capacity of 142 MW in 2016 which aims to execute a minimum of 1000 MW in India in the next three to five years.

**Singapore's Sembcorp to develop 1 gw wind energy project in India.** The government of Madhya Pradesh signed a memorandum of understanding with Singapore-based Sembcorp Green Infra for the development of 1 GW wind energy capacity. The Ministry of New and Renewable Energy has signed the agreement with the company on behalf of the state government. While the details of the agreement or the timeline of its implementation are not known, the size of the capacity addition is expected to be huge. Madhya Pradesh is among the leading states in terms of installed wind energy capacity in India and is expected to see significant growth in its installed capacity over the next few years. According to the Ministry of New & Renewable Energy of the central government, Madhya Pradesh may add 6.2 GW of wind energy capacity as its contribution to the 60 GW installed wind energy capacity target for 2022.

[SeeNews.Renewables](#), 25 January 2016 | [The Economic Times](#), 27 January 2016 | [SeeNews.Renewables](#), 27 January 2016 | [Deal Street Asia](#), 28 January 2016 | [Clean Technica](#), 29 January 2016



### **Mahindra Group inaugurates Bio-CNG Plant at Chennai.**

A joint CSR initiative between Mahindra Research Valley (MRV) and Mahindra World City Developers Limited (MWCDL), the Bio-CNG plant was inaugurated by Piyush Goyal, Minister of State (Independent Charge) — Power, Coal, New and Renewable Energy, in the presence of Pawan Goenka, Executive Director, Mahindra & Mahindra Ltd and other dignitaries.

#### **Synopsis:**

- Spread over an area of 1,000 square metres
- End to end green Bio-CNG plant, a synergistic co-creation between MRV and MWCDL
- To create green energy from 10 tons of daily food and kitchen waste
- Set to generate 1000 m3 of raw bio gas per day which yields 400 kg of purified CNG grade gas/day and 4 tons of organic fertilizer/day as by product
- Biogas to fuel tractors, shuttle buses and power street lights at MWC
- Organic fertilizer to enhance soil fertility

The plant will work on an aerobic digestion of biomass to produce biogas which can be further enriched to make it an auto grade CNG equivalent. Subsequently, the purified gas will be compressed to 200 bars and stored in cylinders to power automobiles. The manure that will come out from the plant will be utilized as fertilizer or composted with organic material for producing compost fertilizer. In MWC the biogas will be used for generating power and fueling CNG buses and tractors. Further, the power generated will be used for street lighting, buses for free shuttle service and tractor for cultivation.

**Trichy railway division gets biodiesel engine.** The first ever biodiesel locomotive rolled out of the Ponmalai Loco Shed here on Tuesday. Divisional railway manager A K Agarwal flagged off the engine along with senior divisional mechanical engineer Rajamani S. The division aims at reducing costs and pollution by introducing more biodiesel-powered engines. The Trichy railway division plans to run all the trains in the division using biodiesel.

**Micro industrial complex set up in Rajasthan village.** A Micro Industrial Complex providing power, water and storage facility to people in a Rajasthan village has been set up in Malunga village in Jodhpur. The MIC has been set up under the science bridge project between DST and Research Council UK (RC-UK). IIT Delhi has provided the equipment while Aston University, UK, has provided collateral support to the project. Based on local needs and use of local resources, the self-sufficient MIC at Malunga consists essentially of a set of boilers and back-pressure turbine and generator capable of producing 150 KW of electricity. The boilers are fed with oil cake (biomass) yielded through crushing of castor seeds at an oil mill having a capacity of 30 tonnes of seeds per day. The Vapour Absorption Machine (VAM) uses the vapour generated through boiler steam for running four cold rooms with a combined capacity of storing 50 tonnes of fruits and vegetables. A multi-effect distillation (MED) system has also been installed which has a capacity of producing 20,000 litres of distilled water per hour. The complex not only utilises local resources but also generates employment. The DST has

invested Rs 7 crore while a local NGO School of Desert Science has provided one acre land for setting up the complex.

**IIT-Roorkee scientists patent low-cost biofuel tech.** Scientists at the Indian Institute of Technology, Roorkee (IIT-R) have achieved remarkable success in generating low-cost biofuel using a perennial weed, Kans grass. Dr Sanjoy Ghosh, principal inventor of the technology and teacher of biochemical engineering at the biotechnology department of IIT-R said through this patented technology bioethanol will be produced as a substitute for petrol. This is a low-cost fuel, in comparison to other varieties of bioethanol now available across the world. This grass, native to the subcontinent, grows up to three feet in height and is used in thatching katcha houses in rural areas. The weed, being widely available and perennial, comes at low cost. Kans grass, known by the scientific name *Saccharum spontaneum*, was chosen as the feedstock for production of bioethanol because of its high yields, low cost, ability to grow in marginal lands with almost no water supply and wide availability right through the year.

[Business Standard](#), 2 January 2016 | [The Times of India](#), 19 January 2016 | [Niti Central](#), 21 January 2016 | [The Times of India](#), 29 January 2016