Renewable Energy Monitor

December 2015

Trending topics

New Development

- India and Belgium ink renewable energy agreement
- India-Malaysia to set up Joint Working Group on renewable energy.
- India 5th on doing biz in clean energy.
- India launched International Solar Alliance (ISA).
- National Institute of Wind Energy launches wind, solar online maps.
- Renewable energy's transformation of the Indian electricity landscape- report.
- ADB to lend $1 billion to PowerGrid Corp for green energy and grid expansion .

Sectoral Development

Solar

- Centre approves pacts with Germany for solar energy.
- SoftBank venture wins first solar power project in India.
- DMRC to make all stations self-sustaining.
- Solar capacity crosses 5,000 MW.

Wind

- Welspun commissions 126 MW wind project in Pratapgarh district of Rajasthan.
- Tata Power, Gamesa India sign pact for 100 mw wind project.
- Inox Wind to produce 2-MW electronic control systems in India.
- NuPower commissions 30 MW wind farm in Maharashtra.

Geothermal

- Gujarat's baby step to tap geothermal energy bears fruit.
- 36 Nations tie up for geothermal energy.

Bioenergy

- Waste biorefinery in the making at Indian Institute of Chemical Technology, Hyderabad.
- Emission norms to inspire biofuel vehicles on roads.
- Bio-fuel policy in for revision; Centre calls meet with industry.

India and Belgium ink renewable energy agreement. The union cabinet on 5 November 2015 approved an agreement between India and Belgium on new and renewable energy at the federal and regional level. The objective of this Memorandum of Understanding is to establish the basis for a cooperative institutional relationship to encourage and promote technical bilateral cooperation on new and renewable energy issues on the basis of mutual benefit, equality and reciprocity. The agreement encompasses development of new and renewable energy technologies in wind energy, biomass, solar (thermal and photovoltaic), smart grids, geothermal energy and marine energy. It also entails renewable energy sources to contribute for the diversification of supply and energy security and other mutually agreed areas.

India-Malaysia to set up Joint Working Group on renewable energy. With an aim to strengthen energy security while increasing energy access, both India and Malaysia have agreed to set up a Joint Working Group on new and renewable energy at the earliest that would serve as a good platform for both countries to exchange ideas and forge mutually beneficial collaboration. In a joint statement issued by the two nations, it was said that sustainable energy development has been a key component towards achieving energy security in the future with both Malaysia and India having actively pursued to increase renewable energy sources.

India 5th on doing biz in clean energy. Considering India's notable policy reforms in the renewable energy sector, Bloomberg New Energy Finance has ranked the country at fifth place on a list of 30 countries on ease of doing business in the renewable energy space. The ranking done by Bloomberg New Energy Finance's annual **Climatescope report** indicates that clean energy's centre of gravity is shifting from developed to developing countries. The report ranked China in the first place, followed by Chile, Brazil, South Africa and India.

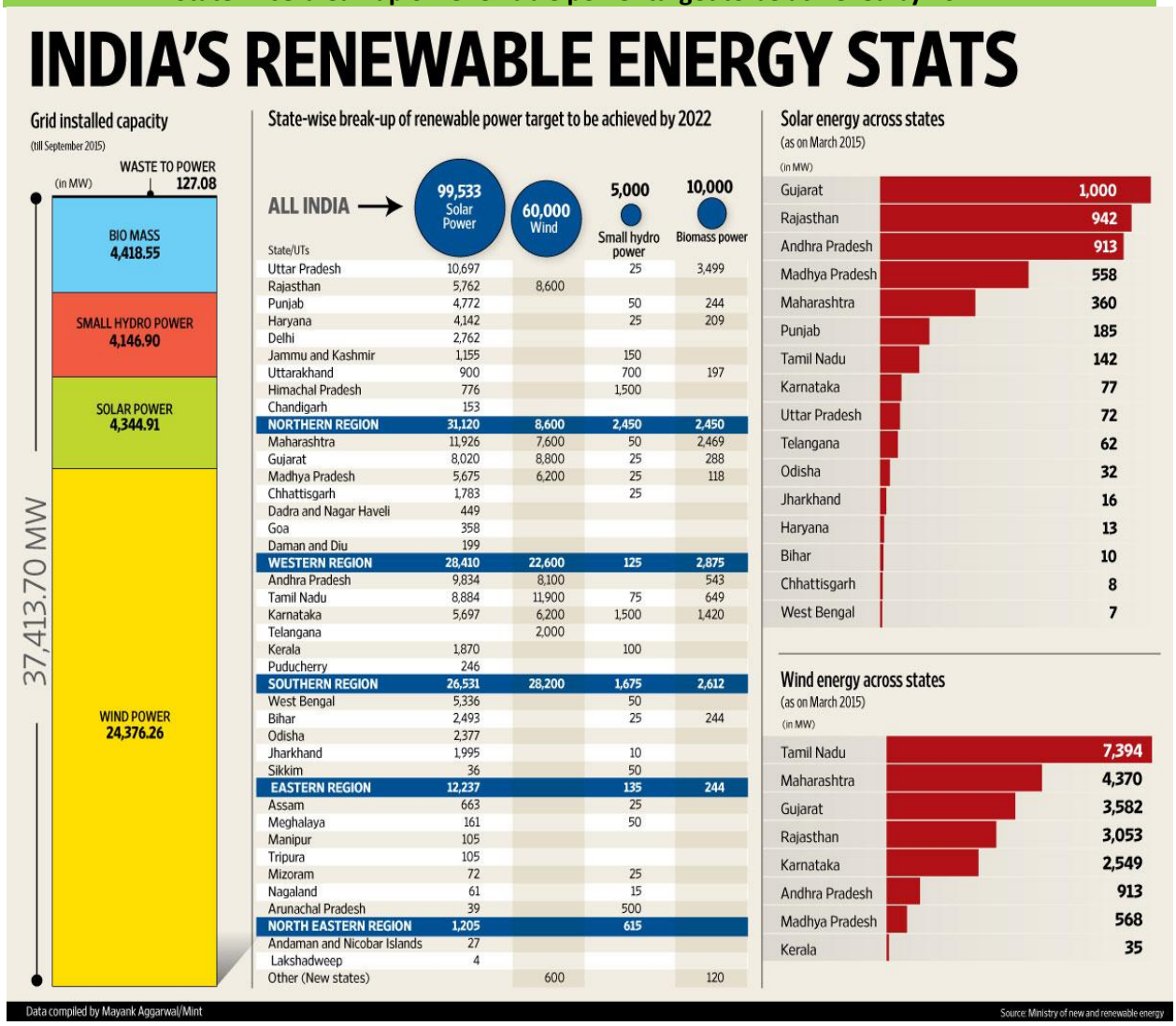
Among the states in India

- Tamil Nadu led the pack with the highest wind energy capacity, followed by Karnataka, Madhya Pradesh, Maharashtra, Rajasthan and Gujarat.
- Madhya Pradesh scored the highest among Indian states on growth rate of clean energy investments. The state’s favourable land policy and easy clearances have resulted in attracting projects.
- Gujarat, which was once a haven of clean energy investments, slipped from the top slot due to policy uncertainty and litigation over tariff.
- Maharashtra’s high feed-in tariff led to a surge in wind capacity.
- Renewable energy in Rajasthan at 4 Gw represents a high share (32 per cent) of total power capacity of 13 Gw, compared to other states.
- At 7.4 Gw, Tamil Nadu has more wind installed than any other state. Since 2012, however, annual new-build rates have fallen and in 2014, only 208 megawatt was commissioned.
- This is largely due to the poor financial health of state-owned distribution utility companies and occasional payment delays to power project owners.

- The Indian government's goal of providing round-the-clock power to 1.25 billion citizens has triggered huge interest from investors. The report noted that a strong energy minister overseeing coal, power, and new and renewable energy sectors could have a positive influence.

- The Modi-led government has revised the targets for renewable energy to 175 Gw by 2022.

State-wise break-up of renewable power target to be achieved by 2022



Source: Mint

Renewable energy's transformation of the Indian electricity landscape. According to the **report** prepared by consultancy firm PricewaterhouseCoopers and renewable energy producer Mytrah Energy Indian renewable energy presents a profitable growth opportunity for investors even as tariffs are declining. The country's renewable energy development is demand driven, unlike in Europe that offers subsidies or bears losses incurred in displacing existing coal or nuclear power. The capital and operating costs of wind or solar projects are far lower in India due to inherent cost advantage and extensive competition. The country's considerations to meet energy demands, sustainability, energy security and lower costs are driving India's renewable energy growth. The industry estimates that Europe will add 109 GW of renewables by 2020 while India aims to add 140 GW to reach 175 GW by 2022. The report, however, said the main buyers of renewable energy in India are state-owned distribution utilities, which are financially distressed and present risk of delayed payments.

International Solar Alliance (ISA) . India launched the alliance at the CoP21 Climate Conference in Paris on 30 November 2015**.** The new body, which has invited all countries located fully or partly between the tropics of Cancer and Capricorn to join, is to function from the National Institute of Solar Energy in India, Gurgaon. India will provide land and $30 million to form a secretariat for the Alliance, and also support it for five years. In its launch resolution, the ISA says it seeks to share collective ambitions to reduce the cost of finance and technology that is needed to deploy solar power widely; generation and storage technologies would be adapted to the individual countries' needs. Among the tasks that the Alliance would pursue are, cooperation in training, building institutions, regulatory issues, common standards, and investment including joint ventures.

To achieve the objectives, ISA will have five key focus areas:

- Promote solar technologies and investment in the solar sector to enhance income generation for the poor and global environment.
- Formulate projects and programmes to promote solar applications.
- Develop innovative Financial Mechanisms to reduce cost of capital.
- Build a common Knowledge e-Portal.
- Facilitate capacity building for promotion and absorption of solar technologies and R&D among member countries.

National Institute of Wind Energy launches wind, solar online maps. The National Institute of Wind Energy (NIWE) has launched two online maps, one each for wind and solar radiation. The **Wind Energy Resources Map of India** has been launched at 100 meter above the ground, while the **Solar Radiation Map** has been set up at ground level on the online Geographic Information System platform. These wind and solar maps are expected to help developers of these technologies identify potential areas of development of new projects. Moreover, it will also help the central and state stakeholders develop infrastructure like transmission systems that are essential for the installation of renewable power projects in the picked areas.

ADB to lend $1 billion to PowerGrid Corp for green energy and grid expansion. Multilateral lending agency Asian Development Bank will provide USD 1 billion loan to central transmission utility Power Grid Corp for renewable energy transmission and grid expansion in India.The funds will be used to build and upgrade high voltage transmission lines and substations in Rajasthan and Punjab, as part of the Indian government's Green Energy Corridor initiative.

Business Standard, 5 November 2015|Business Standard, 23 November 2015| Business Standard, 23 November 2015|The Economic Times, 24 November 2015| Mint 25 November 2015 |The Hindu, 1 December 2015 |DNA, 8 December 2015| The Economic Times, 10 December 2015

Sectoral Development

Solar

Centre approves pacts with Germany for solar energy. The government of India on 02 December 2015 approved a post facto agreement with Germany to expand bilateral cooperation in the field of solar energy. The memorandum of understanding (MoU), was signed in October 2015, between India and Germany, to expand bilateral development cooperation in the field of Solar Energy by increasing use of solar energy in India through technical as well as financial cooperation. Under the agreement, Germany would provide concessional loans in the range of one billion Euros over the next five years through Kreditanstalt fur Wiederaufbau (KfW). The funds of KfW will also be utilized for providing soft loans to the end-users through partner banks. The MoU will help in strengthening bilateral cooperation between the two countries.

SoftBank venture wins first solar power project in India. SB Energy, a joint venture between Japan's SoftBank Group Corp., India's Bharti Enterprises Ltd and Taiwan based Foxconn Technology Group, has won a 350 megawatt (MW) solar power project in Andhra Pradesh after it matched the record low bid seen in the previous round. SB Energy, formerly known as SBG Cleantech, won the project under the Jawaharlal Nehru National Solar Mission at a 25-year tariff of 4.63 per kilowatt-hour (kWh).

PLACE IN THE SUN

Company	Tariff (₹/unit)	Company	Tariff (₹/unit)
SBG Cleantech (SoftBank)	4.63	ReNew Power	5.17
Yarrow Infrastructure (Indiabulls)	4.64	Mira Zavas (China's Trina Solar)	5.18
Azure Power	4.76	Marikal Solar Parks (US' First Solar)	5.34
Reliance CleanGen	4.88		

Source: Industry

DMRC to make all stations self-sustaining. The Delhi Metro is not only the country's largest metro network, but it also enjoys the rare distinction of contributing to around 40 per cent of the city's total solar power generation. So far, all agencies in the national Capital have put together an installed solar power capacity of only about 7 megawatt (MW), out of which 2.8 MW is generated by the Delhi Metro Rail Corporation (DMRC) alone. These roof-top solar systems are installed on a number of its stations, depots and office buildings. The project does not just stop here. Under the upcoming Phase-III, and subsequently in Phase-IV, the DMRC plans to make every station self-sustaining to some extent with the help of solar energy. The DMRC has been looking to switch to solar power as its power bills have been increasing rapidly over the last few years. Since it falls under the non-domestic and non-residential category of consumers, it pays a significantly higher tariff for electricity consumed.

Solar capacity crosses 5,000 MW. India's total installed capacity of solar power has crossed the 5-GW-mark. The total commissioned utility solar capacity in the country stands at about 4.7 GW, while rooftop capacity is 525 MW, according to Bridge to India, a solar energy consulting firm. Mr Vinay Rustagi, Managing Director, Bridge to India, said solar sector has got great momentum with capacity addition in 2015 more than doubling up over last year and total pipeline of over 15 GW of projects under bidding-cum-development. During last fiscal, a total capacity of 1,112 MW of grid connected solar power projects and 44.5 MW of rooftop projects were installed. For the current fiscal, 827 MW

of solar capacity has been added so far. While the central government has laid down the ambitious target of 100 GW by 2022, states have taken the lead over central government schemes in the last year. Encouraged by falling costs and growing need for green energy, states like Punjab, Madhya Pradesh, Karnataka, Telangana, Andhra Pradesh and Tamil Nadu have all announced substantial policy initiatives. Rajasthan, Gujarat and MP have historically been the front runners in solar power capacity addition, but the four southern Indian states are expected to dominate the market over next two years.

The Hindu Business Line, 03 November 2015| India Today, 15 November 2015| The Hindu, 16 November | The Hindu, 06 December 2015| Mint, 13 December 2015

Wind

NuPower commissions 30 MW wind farm in Maharashtra. NuPower Renewables, an independent power producer in the renewable energy space, has commissioned another 30 MW wind power project in Vaspeth village of Sangli district in Maharashtra. The company has nearly 700 MW of renewable energy assets operating and in pipeline located across Tamil Nadu, Karnataka, Rajasthan, Maharashtra, Andhra Pradesh and Madhya Pradesh.

Welspun commissions 126 MW wind project in Pratapgarh district of Rajasthan. The project is the largest wind project in the company's portfolio. The project will generate 290 million units of clean energy and help mitigate 2,11,922 tonnes of carbon emissions annually. The company has invested Rs 840 crorefor this project. Welspun Renewables has successfully developed all its projects well before their scheduled deadlines and at a lower cost ratio as compared to other developers in the clean energy sector. The company has successfully commissioned about 700 MW (DC) capacity of clean energy projects across the country till date.

Tata Power, Gamesa India sign pact for 100 mw wind project. Tata Power and renewable energy firm Gamesa India have entered into a pact for a 100 MW wind turbine project in Andhra Pradesh. The 100 MW turnkey project will entail the supply, erection and commissioning of 50 units of wind turbines in Andhra Pradesh by May 2017. Apart from this, Gamesa is further contracted to offer long term operations and maintenance agreement to ensure smooth functioning of the wind farm.

Inox Wind to produce 2-MW electronic control systems in India. Inox Wind Limited has secured exclusive rights from its US-based technology partner AMSC to manufacture 2 MW electronic control systems (ECS), a critical component in wind turbines, in India. At present, Inox imports all its ECS requirements from AMSC. In addition, the company has also signed an agreement with AMSC to collaborate on the development of a 3 MW turbine for India. The ECS licensing agreement with AMSC grants Inox Wind the perpetual and exclusive right to indigenize the production of electronic control systems, which will play a pivotal role in ensuring continual supply of one of the critical components of a wind turbine generator. It will also further strengthen the company’s control over its supply chain of vital components. Apart from significant savings that will accrue to Inox due to domestic in-house manufacturing of electronic control systems, it also provides Inox with security in terms of sourcing this vital component, over the long term.

The Hindu Business Line, 29 November 2015| The Times of India, 8 December 2015| Money Control, 17 December 2015 | Business Standard, 18 December 2015|

Geothermal

Gujarat's baby step to tap geothermal energy bears fruit. As part of its explorations for geothermal energy, the Centre of Excellence in Geothermal Energy (CEGE) at the Gujarat-based Pandit Deendayal Petroleum University (PDPU) has found success by drilling the state's first geothermal borewell in Ahmedabad. In common parlance, geothermal energy is about tapping the heat under the earth to generate electricity. It's clean and sustainable. Resources of geothermal energy range from the shallow ground to hot water and hot rock found a few miles beneath the Earth's surface, and down even deeper to the extremely high temperatures of molten rock called magma. Coming in just over a year after the PDPU, an industry-government initiative to create talent pool for the energy field, completed pre-feasibility studies in the geo-thermal energy sector, it was around 2.30 a.m. on Thursday when hot water up to 50 degrees Celsius to 55 degrees Celsius temperature started gushing out of the 1,000-foot deep borewell and continued to flow.

36 Nations tie up for geothermal energy. Thirty-six countries gave the official start on December 07 2015 to an initiative to promote geothermal energy in developing econo-mies as a cleaner alternative to oil, gas and coal. **The Global Geothermal Alliance,** launched on the sidelines of the UN climate talks in Le Bourget, aims at a six-fold increase in geothermal electricity production and a tripling of geothermal-derived heating by 2030. At present, geothermal is growing modestly, at three to four per cent per year, providing 12 gigawatts of electricity annually. But this just a fraction of its overall potential of 100 gigawatt , according to the industry. Only 24 out of 90 countries with geothermal potential actually use the resource.

The Hans India, 2 November 2015| Asian Age, 8 December 2015

Bioenergy

Waste bio refinery in the making. Scientists at the Indian Institute of Chemical Technology, Hyderabad, are gearing up to establish an integrated waste biorefinery that would convert wastewater and solid waste into a range of environment-friendly fuels and materials, under a pilot project aimed at cleaning up cities and enabling the transition to a bio-based economy. Under the project to be funded by the Ministry of New and Renewable Energy (MNRE), Department of Biotechnology and the Council for Scientific and Industrial Research (CSIR) will align with the Swachh Bharat campaign for a cleaner India, according to Mr Venkata S Mohan, Principal Scientist, Environmental Bioengineering and Biofuels, IICT.

Emission norms to inspire biofuel vehicles on roads. To check growing air pollution, the Ministry of Road, Transport and Highways is coming up with standards for bio-diesel run vehicles on the lines of diesel and petrol vehicles. The step is meant to encourage production of vehicles run on biofuel, which is a less-polluting alternative. The draft mass emission standards for bio-diesel (B100) has been prepared in consultation with all stake holders, including automobile companies, who have been producing engine compatible to run bio-diesel in other countries. The ministry is ready to open the market for all types of biofuels such as ethanol, biogas, methane and biodiesel, among others. Biofuels are prevalent the world over but India has not ventured into it till now. Once effective, the companies will be allowed to manufacture vehicles fitted with engine compatible to run on diesel or a mixture with bio-diesel, using up to 100 per cent bio-diesel.

Bio-fuel policy in for revision; Centre calls meet with industry. The Centre is considering revising the National Policy on Bio-fuels of 2009. Poor implementation of the policy in the past rendered the goals

unrealised and this has necessitated modifications, particularly in the case of bio-diesel. According to bio-diesel industry sources, the Union Ministry New and Renewable Energy has called a meeting with representatives of Biodiesel Association of India (BAI) on December 21 to discuss the issues, including introduction of a mandatory level of bio-diesel that could be incorporated in the proposed policy amendments. The 2009 policy had set an indicative target of 20 per cent blending of bio-fuels, both for bio-diesel and bio-ethanol, by 2017. Later, the government made 5 per cent use of bio-ethanol mandatory.

The Hindu, 27 November 2015| The Indian Express, 13 December 2015 | The Hindu Business Line, 18 December 2015