

About IREF

The Indian Renewable Energy Federation, inaugurated on January 28, 2014 by the then Union Minister for Renewable Energy Dr. Farooq Abdullah, is India's first multi-stakeholder, technology neutral, scale neutral platform for renewable energy, both off-grid and on grid, solutions.

From IREF news desk

A brainchild of the Indian Renewable Energy Federation (IREF), **RE Digest** is taking its first step into the world of renewable energy news dissemination. In a space dotted by numerous news sites and online forums, **RE Digest** aims to approach the subject with a fresh perspective to convey information as is. Since renewable energy is about sustainability of life in its broader sense, the newsletter will cover all forms of alternative energies as well.

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NEWS

Growth in green collar jobs surpasses losses in coal industry

Employment generation in green energy (wind and solar) was way ahead in recent time than that lost due to collapse of the coal industry. Over 79,000 direct and spin-off jobs were created from wind and solar electricity generation during the 2008-2012 period, according to researchers at Duke University. The researchers gathered data from renewable energy trade associations for its new study that was published in the journal *Energy Policy*. The study also reveals that the United States is likely to witness record growth in renewable energy this year. That compares with an estimate of about 49,530 coal industry job losses, according to the study. While natural gas was the biggest winner in creating jobs for electricity generation, with almost 95,000 jobs created in that time, it's clear that renewable energy has been on the rise in the United States. (www.mcclatchydc.com)

Essel in tie up with 3 German Firms for Smart Cities, Green Energy

Essel Group, India's leading business conglomerate, has entered into technology transfer agreements with three leading German firms at the world's largest trade fair, Hannover Messe 2015, in Germany. While a memorandum of understanding (MoU) for transfer of critical technology in wind and solar energy was signed with FeCon GmbH, a subsidiary company of Wind and Sun Technology GmbH; a similar pact was also inked with Passavant Energy and Environment (PE&E) GmbH for mega-scale wastewater treatment projects in India. A letter of intent (LoI) has also being signed with Schneider to develop smart city projects in India. (www.dnaindia.com)

IRENA launches New Tool to help develop Renewable Energy Projects

A comprehensive platform to facilitate the effective development of renewable energy projects worldwide

is now available online. The **Project Navigator** tool, launched by the International Renewable Energy Agency (IRENA) in April 2015, provides project developers with the knowledge, tools, case studies and best practices needed to support the successful completion of their projects. The Project Navigator aims to increase the percentage of successful renewable energy project proposals worldwide. (*Energetica India*)

CERC picks Deloitte, KPMG to review Operations of Power Exchanges

The Central Electricity Regulatory Commission (CERC) has selected through a bidding process Deloitte Touche Tohmatsu India Pvt. Ltd. to review the functioning of Indian Energy Exchange Ltd., and KPMG Advisory Services Pvt. Ltd. for Power Exchange India Ltd. The period of the review will be FY 2012-14. According to CERC, the purpose of the review is to check whether the exchanges are complying with provisions of the Power Market Regulations, 2010 such as robustness of the operational processes, risk management measures in place to ensure business continuity; and also for safeguarding interest of various stakeholders. It is for the first time that such a review is being carried out since both the exchanges became operational in 2010. (*profit.ndtv.com*)

NTPC to raise \$1bn via Rupee-dominated Green Bonds

Public sector company NTPC Ltd. is set to raise \$500 million each from its first global Rupee green bonds that it plans to sell soon. The \$1-billion bond sale, approved by the board of India's largest power producer, ties in with the government's aim of raising low-cost, long-term funds to help finance its renewable energy objectives. The Reserve Bank of India in April allowed companies to sell Rupee-denominated bonds overseas, a move that it said would help Indian borrowers raise debt abroad without taking on currency risks. The low-cost funds will help cut the cost of clean power for the utility., which has an ambitious capital expenditure target of Rs. 1.5 trillion for the five years to 31st March, 2017. (*Mint*)

India considers Green Bond Issues to fund RE Expansion

The Indian government has asked at least eight financial institutions to raise funds for renewable capacity expansion. These funds are expected to be raised through issuance of green bonds. Public sector entities like Rural Electrification Corporation, Power Finance Corporation, IDBI Bank, Indian Renewable Energy Development Agency, and private sector entities like India Infrastructure Finance Limited, ICICI Bank, and Yes Bank, have all been asked to issue green bonds to raise funds for renewable energy projects. (*Clean Technica*)

RBI rejigs Priority Sector Lending Norms to align with Govt. Policies

The Reserve Bank of India has revised priority sector lending norms, asking banks to give 8 per cent of the total credit to small and marginal farmers. It also widened the definition of priority sector by including medium enterprises, social infrastructure and renewable energy while retaining the lending target to the sector at 40 per cent. This was done in an attempt to align with government policies. (*First Post*)

Investment in Renewables increases 59 per cent in 2015

Investment in the Indian renewable energy sector shot up 59 per cent year-on-year during the first three months of 2015 to \$1.6 billion, according to a report by Bloomberg New Energy Finance (BNEF). While BNEF predicts that the investment trend in the renewable energy sector remains on track to cross \$10 billion in 2015 for the first time since 2011, it still falls short of the levels of commitment made by firms at the recently held RE-Invest 2015 conference. (*Hindu Business Line*)

Sidbi, KfW plan to inject Rs. 100 cr in Clean Tech Start-ups

Small Industries Development Bank of India (Sidbi) and German development bank Kreditanstalt für Wiederaufbau (KfW) plan to allocate over Rs. 100 crore to clean technology-focused start-ups in 2015-16 as both agencies look to ramp up their support for early-stage

ventures operating in this sector. (*Economic Times*)

Clean Energy Access Network aims to provide Energy Access to 300 mn People

Clean Energy Access Network (CLEAN), formed by 12 key stakeholders in the decentralised energy access sector, is aiming to expand access to affordable and reliable energy solutions for India's 'last mile' – which includes over 300 million people who have not been reached by the national grid and do not have access to electricity.

CLEAN has been formed by Ashden India Collective; Council on Energy, Environment and Water; GIZ India; Indian Renewable Energy Federation; SELCO Foundation; Shakti Sustainable Energy Foundation; Small Scale Sustainable Infrastructure Development Fund; The Climate Group; The Energy and Resources Institute; The Nand and Jeet Khemka Foundation; United Nations Foundation Energy Access Practitioner Network; and World Wide Fund for Nature - India. (*Business Standard*)

Over 1 crore Renewable Energy Certificates unsold at IEX

Showing continued sluggishness in the renewable energy certificates market, more than one crore such certificates remain unsold at the power bourse IEX, even as the government aims to boost green energy generation in the country. Renewable Energy Certificates (RECs) are aimed at providing an easier avenue for various entities, including power distribution companies, to meet their green energy obligations. However, the trading of these certificates on Indian Energy Exchange (IEX) has remained sluggish. The exchange accounts for over 90 per cent of the domestic electricity trading market.

In the last fiscal (2014-15), just about 30.6 lakh RECs were traded on the exchange whereas 96 lakh such certificates were available. Out of the total certificates available, 2.5 lakh were retained by the renewable energy generators for their own use. Out of the total RECs traded, there were 1.6 lakh solar certificates and 82 lakh non-solar ones during the period. According to IEX director (business development) Rajesh K. Mediratta, the main reason for lower demand is the lack of interest shown by obligated entities in meeting their Renewable Purchase Obligation. (*PTI*)

SOLAR

TerraForm Power acquires 168 MW of solar projects from SunEdison

TerraForm Power, an owner and operator of renewable energy projects, announced that it has acquired solar projects comprising 168 MW from SunEdison, a solar energy services and technology provider, during the first quarter of 2015. The acquired portfolio includes US distributed generation projects representing 15 MW and eleven utility-scale, ground mounted projects in the UK comprising 153 MW. Together, the projects are expected to contribute \$17M in cash available for distribution (CAFD) in 2015, and generate annualized unlevered CAFD of \$24M. Installation has been completed for all 168 MW in the portfolio. *(TerraForm Power)*

Greece's PV Net-Metering Scheme begins

The Hellenic Electricity Distribution Network Operator (HEDNO), an electric utility, has started accepting application for PV projects under Greece's net-metering scheme. The country's TSO will accept applications for PV projects of up to 100 kW in Mainland Greece and few islands, while for Crete and the vast majority of non-interconnected islands the maximum power will be of 50 kW and 20 kW, respectively. The Greek Ministry of Environment introduced a net-metering scheme for PV installations at the end of 2014. The new scheme, which is specially designed to encourage consumers in agricultural areas to install PV systems for self-consumption, will enable owners of rooftop or ground-mounted PV systems with a power of up to 100 kW to inject surplus power into the country's grid. *(HEDNO)*

Solar power takes on global energy

Solar power is set to become profitable in Japan as early as this quarter, according to the Japan Renewable Energy Foundation (JREF), freeing it from the need for government subsidies and making it the last of the G7 economies where the technology has become economically viable. Japan is now one of the world's four largest markets for solar panels and a large number of power plants are coming on-stream, including two giant arrays

over water in Kato City and a \$1.1 billion solar farm being built on a salt field in Okayama, both west of Osaka.

Japan is retiring nearly 2.4 GW of expensive and polluting oil-fired energy plants by March next year and switching to alternative fuels. Japan's 43 nuclear reactors have been closed in the wake of the 2011 meltdown at the Fukushima power plant after an earthquake and a tsunami - since then, renewable energy capacity has tripled to 25 GW, with solar accounting for more than 80 per cent of that. *(<http://www.reuters.com>)*

China to restrict PV Capacity Expansion

China will restrict solar PV manufacturers from boosting production capacity in a bid to raise environmental standards, the Ministry of Industry and Information Technology said. The government will tighten control over developing new projects which boost the production capacity of PV makers. It will also demand that PV producers replace their old machinery with more advanced and environment-friendly equipment. The PV makers are also required to spend at least yuan10 million (~\$1.6 million) or more than 3 per cent of their revenue every year on technological research and upgrading, whichever is greater. *(Ministry of Industry and Information Technology, Shanghai Daily)*

Andhra to soon become Renewable Energy Hub

The Andhra Pradesh government has come up with a comprehensive action plan to turn the State into a renewable energy hub in the next four years. As part of this plan, the government aims to achieve 5,000 MW solar power and 4,000 MW wind power by 2019 to meet the twin objectives of energy security and clean energy considerations. Impressed with its new solar and wind policy, German Bank KfW has agreed to sanction Rs. 515 crore at concessional rate of interest towards the green energy corridor project.

The State government is also contemplating to constitute a taskforce for expediting renewable energy projects. *(Business Standard)*

WIND

Britain, Norway to build World's Longest Power Cable

Power grid operators in the UK and Norway have agreed to build a \$2-billion power cable linking the countries' electricity systems. The 450-mile cable - the longest of its kind in the world - will allow the UK to increase its share of renewable energy. Norway's grid operator Statnett SF and the UK's National Grid said the interconnector will stretch 450 miles across the North Sea and have the capacity to move 1,400 MW of electricity - enough power to light up around 7,50,000 British homes. Statnett and National Grid will share the investment on the power cable that would be completed in 2021. The UK power grid is already linked to France, the Netherlands, Ireland and Northern Ireland, with 4,000 MW of exchange capacity, or about 5 per cent of the total UK generation capacity. (*ibtimes.com*)

'2014: A Record Year for Wind'

The Global Wind Energy Council has released its flagship report highlighting global wind energy growth throughout 2014, led by emerging markets in Africa and Latin America. With 2014 setting another record year for the global wind industry, following annual installations surpassing 50 GW, and investments into the wind energy sector rising by 11 per cent, much focus has been given to what 2015 and the years following will look like for wind energy. The Global Wind Energy Council's *Global Wind Report: Annual Market Update* report also highlighted the important role emerging countries are playing in the global wind industry: China installed 23 GW of new wind capacity in 2014, bringing its cumulative total up to a staggering 114 GW. Brazil was the world's 4th largest installer in 2014, and entered the top 10 cumulative rankings for the first time. The African wind energy market also took off in 2014, while Germany, Chile, Canada, and Turkey also had record years. (*Clean Technica*)

New Feed-in Tariffs for Small Wind in Denmark and Poland

Two European countries have taken important steps to

boost their domestic markets for small wind turbines. Denmark is preparing the introduction of a feed-in tariff (FIT) for small wind turbines. The planned remuneration is Euro 0.33 per kWh for units up to 10 kW and Euro 0.20 per kWh for up to 25 kW. The country already has the highest wind power share of 40 per cent, mainly due to large wind turbines. Poland has adopted a new renewable energy law, which will include a feed-in tariff for small wind turbines as well. Up to 3 kW, the FiT will be Euro 0.17 per kWh, and up to 10 kW, the rate will be Euro 0.15 per kWh. This decision has the potential of creating major changes in the Polish renewable energy market. The indicated feed-in rates, if implemented in a comprehensive way, will allow the small wind sector in both countries to grow substantially. (*www.sunwindenergy.com*)

Singapore's Sembcorp to Invest \$1-bn in India

Sembcorp Industries, Singapore's leading utilities and ship building group, is looking to invest \$1 billion over the next five to seven years to double its clean energy generation portfolio in the country while gradually moving away from large, greenfield thermal coal projects that are still facing land acquisition and fuel linkage logjams. In February, Sembcorp Utilities, a wholly-owned subsidiary, acquired a 60 per cent stake in Green Infra - a leading renewable energy platform - from its private equity owners IDFC Alternatives for Rs. 1,051 crore. This was their first investment in the space in India. (*Economic Times*)

India beats Renewable Energy Target

India's renewable energy market is showing the first signs of revival as the installed capacity jumped by 12.9 per cent during the 12 months to 31st March, 2015, according to latest data released by the Ministry of New and Renewable Energy. India added 4,089 MW renewable energy capacity in financial year 2014-15, a capacity addition of 8.5 per cent more than the targeted figure of 3,770 MW.

While 2.3 GW wind energy capacity was added as against a target of 2 GW; solar power capacity had a share of 10.5 per cent, up from 8.3 per cent at the end of FY 2013-14. The capacity addition target of 250 MW for small hydro

power technology was also achieved. Capacity addition target was overachieved in bagasse-based cogeneration as well where projects worth 360 MW were added as against a target of 300 MW. Biomass-based power generation missed the capacity addition target, adding only 45 per cent of the targeted value. Just 4 per cent of the capacity addition target was achieved in the waste-to-power category.

The total renewable energy installed capacity in India at the end of FY 2014-15 stood at 35.77 GW. The Union government plans to increase this capacity to 175 GW by end of 2022. (*Clean Technica*)

ENERGY EFFICIENCY

Green Bank to invest in Projects in India, South Africa

Green Investment Bank (GIB) has announced a pilot project to fund overseas ventures in energy efficiency and renewable energy sector to the tune of 200 million pounds (approximately Rs. 1,800 crore) in India, South Africa and east African nations. This proposal is in addition to GIB's allocation of 3.8 billion pound for UK projects. (*PTI*)

OTHER RENEWABLES

BIOFUEL

EU reaches tentative cap on food-based biofuels

The European Union reached a tentative deal on a 7 per cent limit on how much crop-based biofuel can be used in the transport sector, according to EU sources. The agreement on a legal text, thrashed out by representatives of the European Commission, the parliament and member states follows years of argument on traditional biofuels, which were once seen as environmental, but are now considered to do more harm than good. This compromise deal should mark almost the final stage in establishing a new piece of EU law, although it still needs official endorsement. The Environment Committee of the European Parliament will vote on it and then a plenary session of the parliament will have to endorse it, parliamentary sources said. Current legislation requires EU member states to ensure that renewable sources account for at least 10 per cent of energy in transport by 2020. However, research has shown the damage caused by many crop-based biofuels, such as those from maize and rapeseed. Apart from driving up food prices, using farmland to produce biofuels adds to pressure to free up land through deforestation, which can result in increased greenhouse gas emissions. (<http://www.reuters.com>)

Bengal offers 10 per cent higher FAR to green buildings

West Bengal is committed to encourage green building practices and is offering 10 per cent higher floor area ratio for green buildings. "The State is committed to encourage green building practices and the challenge is to put in place a system for effective implementation and monitoring," Urban Development and Town & Country Planning secretary Debashis Sen said. He said the State had come out with a notification to grant an increase of 10 per cent FAR for projects achieving green rating. (*PTI*)

WASTE MANAGEMENT

Two fraction underground recycling system opened in India's first smart city

An integrated automated waste and recyclable segregation plant in the Gujarat International Finance & Tec-City (GIFT City) – India's first smart city covering 886 acres in Gandhinagar – has started operation. The plant has been supplied by Swedish underground automated waste collection company, Envac. The smart city project is expected to be completed between 2025 and 2028. It will comprise 112 towers each ranging from 25 - 60 floors, residential and commercial zones, hospitals and schools and a trade centre. Upon completion of GIFT City,

Envac will handle the waste of the entire district, which is expected to be over 400 tonnes per day. (*waste-management-world.com*)

Revised rules on Waste Management by July 15: Javadekar

The Union government will come out with revised rules on waste management by July 15, according to environment minister Prakash Javadekar. The reason behind the revised rules is to make waste management more effective and scientific to change the face of the country in the next three-four years and thereby achieve Swachh Bharat. The revised rules pitch for segregation of waste at the source. "The rules on waste management are being revised as the norms (on solid waste, e-waste, biomedical waste and plastic waste) have not been changed for many years," he said, adding that rules are being changed taking public views. (*PTI*)

ELECTRIC VEHICLES

Tata and Manipal University unveil new prototype solar car



Tata Power Solar and Manipal University showcased the prototype of a solar electric car. The car was designed by Manipal University's students' twenty-seven member SolarMobile Team, in collaboration with Tata Power Solar which produced the solar panels. The project was named SERVe short for Solar Electric Road Vehicle. The two-seater car weighs 590 Kg and the solar panels weigh just 35 kg (half the weight of conventional solar panels) and

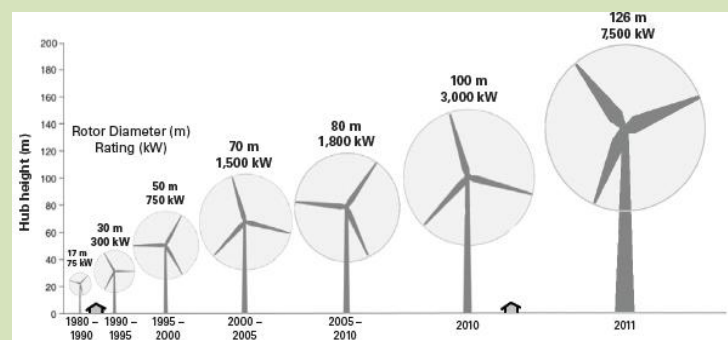
provide up to 960 watts of power. The car was designed keeping mobility and commercial viability in mind, so the solar panels have been built to fit around the car's curved shape. This enhances the aerodynamics of the vehicle and enables it to maintain a high performance. The car has a direct solar drive that maintains the cruising speed of 30kmph and is supplemented by extra power from a high-end energy storage system. The car has a top speed of 60 kmph. (*SiliconIndia*)

New Motion to invest Rs. 1,000 cr in Indian EV market

New Motion, a Dutch tech company specializing in charging solutions for electric vehicles, is planning to invest Rs. 1,000 crore in India. While charging a car with a regular power socket can be carried out in 6 to 7 hours, this is possible in just 15-30 minutes via the New Motion smart chargers. The company is planning to set up a manufacturing base in India. (*www.rushlane.com*)

TECHNOLOGY SOLUTIONS

Wind Turbine Technology Development Over The Decades



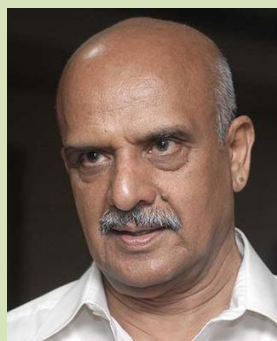
According to the International Energy Agency, the size of wind turbines has continued to increase. The average rated capacity of new grid-connected onshore turbines in 2012 was 1.8 MW, compared to 1.6 MW in 2008, though the largest commercial wind turbine available today is 7.5 MW, with a rotor diameter of 127 meters. Offshore turbine sizes have grown from 3 MW to 4 MW in 2012. However, turbines with a rated capacity ranging from 1.5 MW to 2.5 MW still make up the largest market segment. (*EWEA*)

VIEWS

Regulatory and policy issues have been the bane of the renewable energy industry. Uneven benchmarks for tariff determination often put off investors. More over, matters such as poor RPO enforcement have led to downfall of the Renewable Energy Certificate (REC) market. Besides, there is no policy in place to enable intra-State open access. *RE Digest* caught up with regulators to understand their point of views on such issues and posed two critical questions engulfing the renewable energy regulatory space.

IREF: How can we have common benchmarking for renewable energy tariff determination across States?

IREF: What role can State regulators play in contributing towards strengthening the REC market?



**Dr Pramod Deo, former chairman,
Central electricity Regulatory Commission**

Answer 1: The CERC has set renewable energy tariff determination principles and it keeps revising these from time to time. The law itself says that tariff determination regulations for generation and transmission of electricity set by the central commission shall be guiding principles. Guiding means that it is really mandatory. So incase you want to make any change or departure in that then you should give reasons. However, that is something which is not followed. This needs to be challenged. While it is for the State regulators to finally

decide their tariff, if a State does not adopt the tariff then it should clarify, give reasons for such a move. This is not done. The industry associations should come forward to challenge it. In the Forum of Regulators we try to resolve issues with State regulators however beyond a point it is difficult.

Answer 2: When State regulators start enforcing renewable purchase obligation then the discom either has to buy green energy which is mostly wind power or they have to buy REC. The regulators are not enforcing RPO because they don't want tariffs to go up. So whenever a discom files application giving excuses you have to turn headmaster. The solution is that the regulators have to enforce RPO. This needs to be challenged in Appellate Tribunal. However, the Appellate Tribunal also did not give a clear judgment.



**Mr. Sreenivasa Murthy, former chairman,
Karnataka Electricity Regulatory Commission**

Answer 1: The cost of renewable energy depends upon the capital cost of equipment for generation and the finance cost for capital investment with the exception of biomass and co-generation where fuel cost is additional. The capital cost of equipment and the finance cost are more or less comparable across States in the country. Therefore, it should be possible for us to have a common benchmark for renewable energy tariff in most cases with the exception of biomass and co-generation.

The other variable factor is one of capacity utilisation. In wind energy, it differs from place to place within a State as well as from State to State and in different regions. Therefore, that's another factor that does account for some degree of variation in tariff. The O&M cost and interest rate are almost similar, there is not any vast difference.

The Electricity Act makes the State regulator responsible for promoting renewable energy; it is not the mandate of the CERC. That being the case, each State regulator must exercise the prerogative of having to study these costs and then come to a conclusion. There are other things also like at what cost the State grid can afford to buy renewable energy and this also differs from State to State. Due to these factors there can be some variation in the RE tariff from State to State.

Answer 2: The REC market can be strong if the Renewable Purchase Obligation (RPO) is enforced strictly in every State. Further, the RPO should be based on a rational criterion of what should be the average for the entire country with respect to renewable energy portfolio rather than one State having 10 per cent RPO and another State having 1 per cent RPO. A national portfolio standard should be worked out and everyone should adhere to that. It should be linked to something like the National Action Plan on Climate Change. After all, it is only a percentage of the actual energy that is consumed in a State; it is not an absolute number. The additional burden, if any, on the consumers in any State can only be a few paise per Kwh (in most cases about ten paise) in terms of the average tariff. Therefore, I think it should not be very difficult to enforce RPO in all States with reference to a common average.

State regulators are often criticized for RPO non-compliance. Whether the State regulators are lax or unable to enforce it on account of the weak financial position of the Discoms is a question that needs to be gone into. There is huge backlog of receivables with State utilities. There are deficits and receivables of Rs. 70,000 crore-80,000 crore in some States and the financial health of the distribution sector can not improve unless that is addressed. There are also States with only Rs. 1,000 crore-2,000 crore deficits which can be addressed much more easily. So it has ballooned into a big problem right now and there has to be a major policy initiative. Thankfully, there is at least an awareness of the magnitude of the problem. Now, every State regulator is getting into the habit of issuing annual tariff order which was not the case 3-4 years ago and the proposed amendment to the Electricity Act also mandates that the regulator must ensure that all the expenditure is recovered. So I think we are making progress in that direction but not fast enough.



**Mr. Pravinbhai Patel, chairman,
Gujarat Electricity Regulatory Commission**

Answer 1: The RE tariff determination procedure can be common but parameters will be different since wind energy potential, wind speed etc varies from State to State. Each regulator has its own thinking and in conventional energy tariff determination also different norms are set by each State regulator. Each State regulator has its own thought process and its own logic so parameters cannot be common. In respect of interest rates also, there is a principle regarding on what basis

you allow. Earlier it was the prime lending rate and now it is the base rate plus 2.5 per cent, some say 3 per cent. So every State Electricity Regulatory Commission gives its logic in its order or in the MYT order regarding what should be the interest rate. RE potential is very important for tariff determination – if the potential is low then tariff will be high and if it is very good then utilization factor will be high and naturally the tariff will come down. Moreover, the CERC regulations are not mandatory but only recommendatory for the States.

Answer 2: The REC market, in my view, cannot be promoted by State regulators. In Gujarat, where wind potential is very high our discoms are not able to buy wind power because many of the wind developers are not coming forward to sell the power to discoms at feed-in tariff. They say we will go in for REC, you buy my electricity and purchase REC from the exchange. The REC mechanism was primarily developed for the States where there was no potential. If the States with high renewable energy potential have to buy the electricity at APPC and over and above that the RECs also, then this, in my view, is not justified.

POLICY AND REGULATIONS

PXIL, IEX to roll out round-the-clock Intraday, Contingency Trading

The Central Electricity Regulatory Commission (CERC) has ordered the two power exchanges - Indian Energy Exchange (IEX) and the Power Exchange of India Limited (PXIL) - to start operation of round-the-clock intraday/contingency market by 8 July, 2015. The order, which was in response to a staff paper by CERC for consideration of extension of power transaction hours at the exchanges, includes - Same day Delivery (up to 2400 hours) and Next day Delivery (0000-2400 hours).

The central commission plans to simplify the procedure to obtain regulatory clearances, NOCs and approvals for the round-the-clock intraday market. The two exchanges have been directed to submit any necessary amendments required in the Rules, Bye-laws or Business Rules to execute the RTC intraday market in a month's time. POSOCO has been asked to communicate approval/rejection of scheduling of bilateral transactions for intraday/contingency contracts and inform the power exchanges and the applicant within 1 hour of receipt of such application.

Andhra Pradesh Solar Power Policy, 2015

The Andhra Pradesh government issued its new solar power policy, to replace the previous one issued in 2012. The main objectives of the policy are to get 5 GW solar power online in the next 5 years and promote solar equipment manufacturing. The policy also gives directions about migrating projects from Solar Policy 2012 i.e. projects commissioned after 30th June 2014, to the new policy. Policy highlights are listed in below table:

Particulars	Details
Operative period	5 years. SPPs will be eligible for the incentives for a period of 10 years.
Wheeling charges	Exempted for Intra State OA.
Banking	100% banking all year round, with charges @ 2%.
Open access	Will be granted for 25 years or for lifetime of project, whichever is earlier.
Solar manufacturing	Incentives like exemption from electricity duty for a period of 10 years & priority in land allotment will be provided.

Andhra Pradesh Wind Power Policy, 2015

The Andhra Pradesh government released its new wind power policy to replace the earlier one. The policy has been revised to attract new investment in the State. Under the policy, NREDCAP will act as a nodal agency. The new policy mentions the possibility of re-powering projects having lower capacity and lower hub height WEGs as well as those having completed over 15 years of life. In such instances, amendment will be required in existing PPAs.

Particulars	Details
Operative period	Five years or till such time a new policy is issued.
Wheeling Charges	Wheeling charges exempted for intra State open access, but will be applicable for inter State open access.
Banking	100% banking all year round, with banking charge @ 2%.
Open access	Will be granted for 25 years or for lifetime of project, whichever is earlier.
Electricity Duty	Exempted from paying electricity duty in case of sale of power to AP discoms.

Andhra, Telangana Order on New Cross Subsidy Surcharge for OA consumers

The Andhra Pradesh Electricity Regulatory Commission has issued an order stating that the Cross Subsidy Surcharge will apply on open access consumers for FY 2015-16. The Telangana State Electricity Regulatory Commission (TSERC) has also released a similar order for FY 2015-16.



BERC confirms Solar Tariff for FY 2014-15

On 9th April 2015, the Bihar Electricity Regulatory Commission finalised the new solar energy tariff. It had earlier invited comments and suggestions from stakeholders on a consultative paper under its notification dated 30th September 2014. The tariff details are given in the table below.

Particulars	Levelling Tariff Rs./KWh	Levelling benefit of AD Rs./KWh	Net levelling Tariff with AD Benefits Rs./KWh
Solar PV Power Projects including Rooftop Solar PV Projects	7.69	0.76	6.93
Solar Thermal	11.84	1.23	10.61

CERC proposes Generic Tariff for RE sources for FY 2015-16

On 3rd March 2015, the Central Electricity Regulatory Commission issued draft order determining generic levelling tariff for renewable energy technologies for FY 2015-16. The generic tariff proposed for various RE technologies is given in the table below:

Proposed Generic Tariff for RE Technologies for FY 2015-16			
Particulars	Levelling Total Tariff (FY 2015-16) (Rs./kWh)	Benefit of AD (Rs./kWh)	Net Levelling Tariff (With AD benefits) (Rs./kWh)
Wind Zone -1 (CUF 20%)	6.58	0.71	5.87
Wind Zone -2 (CUF 22%)	5.98	0.64	5.34
Wind Zone -3 (CUF 25%)	5.27	0.57	4.70
Wind Zone -4 (CUF 30%)	4.39	0.47	3.92
Wind Zone -5 (CUF 32%)	4.11	0.44	3.67
Solar PV and Solar Thermal			
Solar PV	7.04	0.69	6.35
Solar Thermal	12.05	1.25	10.80

KERC re-determines Wind Power Tariff; revises APPC for FY 14-15

In modification of its earlier order dated 10th October, 2013, the Karnataka Electricity Regulatory Commission has re-determined the tariff for wind power plants at Rs. 4.50 per kWh for all the new projects established during the control period of five years commencing from 10th October, 2013. With respect to projects which have already entered into PPAs with ESCOMs from 10th October 2013 and up to the date of this Order, the tariff as determined in the Order shall be applicable.

On 31st March 2015, the KERC finalised the APPC for FY 2015-16 at Rs. 3.06 per unit however, this might be revised once the ESCOMs finalise their accounts for FY 2014-15. The Commission also revised the APPC for FY 2014-15.



ApTel orders SERCs to comply with RPO regulations

In response to a petition filed by various associations, the Appellate Tribunal (ApTel) gave its judgment directing State Electricity Regulatory Commissions (SERCs) to comply with RPO regulations. Observing that several SERCs were not complying with the RPO regulations, it ordered State commissions regarding the setting up of RPO and regular review of the same. The order states that carry forward and review will be done as per the RPO regulations, and power to relax and remove difficult should be used judiciously.

Q&A

Interview with Mr. Pashupathy Gopalan, president (Asia-Pacific), SunEdison

‘Govt should help develop fully integrated solar PV manufacturing base with focus on polysilicon’



Having made a successful India foray, US-based solar energy firm SunEdison is expanding its renewable energy basket. It has been in news for its \$4-billion joint investment plan with Adani Enterprises towards India's biggest solar photovoltaic manufacturing facility in Gujarat. SunEdison's recent plans include its entry in the Indian wind sector with the acquisition of First Wind and a green energy commitment for 15 GW of solar and wind power development during RE-Invest. In an exclusive interview with *RE Digest*, Mr. Pashupathy Gopalan, president (Asia-Pacific), SunEdison, says his company is very bullish on the Indian market and will continue to contribute its world leading technology to support the emergence of India as a global solar energy leader.

IREF: SunEdison is in India since 2010. How has been the company's growth curve?

Mr. Pashupathy Gopalan: We started SunEdison India operations in 2010 and since then have developed close to 250 MWs of large-scale utility power plants, rooftop solar, agricultural water pumps and rural micro-grids. We have been recognised for our innovative projects in the country and were awarded the “Sourya Urja Puraskar 2014” for that. This includes the 1-MW project built over the Narmada Canal and signing a private power purchase agreement (PPA) with a leading multinational bank, at their Chennai campus in 2012 (first-ever in India). We have also won the award for “Best Solar Power Producer in India” for the year 2012. We have developed a pipeline of close to 800 MW in the States of Andhra Pradesh, Karnataka, Tamil Nadu, Madhya Pradesh and Rajasthan which we will be executing in the next 1-2 years.

IREF: Does the company have a long-term vision for RE addition to its portfolio – say over the next 5 years / 10 years? What will be the possible volumes and the time scale for achieving the volumes?

Mr. Pashupathy Gopalan: SunEdison has recently given a commitment to the Union government to develop, finance and construct 15,200 MW of solar and wind projects in the country till 2022. We have also signed MoUs to develop 5,000 MW of renewable energy plants each with the Rajasthan as well as Karnataka government.

We are very bullish on the Indian market and will continue to contribute our world leading technology and deployment capabilities to support the emergence of India as a global solar energy leader under the vision and leadership of the Honorable Prime Minister, Shri Narendra Modi and the Honorable Energy Minister, Shri Piyush Goyal.

IREF: You have announced the setting up of decentralised renewable energy, totalling 5,000 projects. What is the size of the decentralised RE market in your view? Will the market sustain, given the focus on grid power?

Mr. Pashupathy Gopalan: Decentralised renewable energy plants like rooftops, micro-grids and solar water pumps for irrigation are starting to make an impact. In the year 2014, SunEdison installed more than 1,500 agricultural solar water pumps in the country and we are observing that a lot of effort is being made by various State energy ministries to bring this up to a substantial scale. There is an opportunity to replace the current 25-30 million irrigation pumps in the country with solar water pumps which not only saves the diesel/electricity cost for the farmers but also gives them a predictable supply of water and increases land utilisation and crop efficiency.

There are 300-400 million people that do not have energy access and solar micro-grid can be a potential solution. Solar combined with storage is rapidly coming down in terms of cost thereby making it a real possibility. This market can grow to becoming several GWs.

IREF: What kind of changes / initiatives in the policy as well as regulatory space you would like to see in the near future to accelerate the growth of renewable energy, especially in the backdrop of the ambitious RE goals of the Union government?

Mr. Pashupathy Gopalan: Firstly, there needs to be a consistent and stable policy with clear visibility for 3-5 years.

Secondly, the government should focus heavily on investing in the required infrastructure for renewable energy like grid availability and capacity, and easy road access to remote areas where land availability is more. For India, to meet its yearly solar energy targets, it is extremely crucial for the Union and State governments to support a highly user friendly, transparent and quick process of land allocation, permits and approvals and the removal of many unnecessary bureaucratic hurdles.

The government also needs to enhance the liquidity of funds for renewable energy. The government can consider creating separate sectoral limits for banks with respect to the renewable energy sector and bring it under priority sector lending.

Lastly, while we support bidding to allow price discovery, for faster and successful execution of projects, all central and State level programmes should be based on a book-building process in bidding. This will lead to reduction in project commissioning default risk. It will also lead to a wide variety of technologies and solutions being used, and promote innovation in the field of solar energy.

IREF: There is general feeling that the Union government and the State governments are not on the same page as far as renewable energy is concerned. What has been your experience in this regard?

Mr. Pashupathy Gopalan: We have seen a lot of traction in India for solar since the new government came to power at the center. Prime Minister Narendra Modi is very passionate about solar and has announced that India will do 175 GW of renewable energy by 2022, of which solar energy would be 100 GW. Many States have made great progress following this announcement. Large-scale utility tenders for solar have been announced e.g. Karnataka (500 MW), Andhra Pradesh (500 MW) and Telangana (500 MW). These States are soon going to announce round 2 biddings. Other States like Madhya Pradesh, Punjab and Bihar are also ready to announce their plans for solar energy. The JNNSM Phase 2 batch 2, which is expected to see implementation of 1,500 MW aggregate capacity of grid connected solar power, will also be announced

by the government soon. This clearly shows that solar energy has arrived in India and will make a significant impact in the power scenario in the country in the near future.

IREF: India suffers from a major skill gap in the renewable energy segment. As a prominent industry player, what steps would your company take to help fill the void?

Mr. Pashupathy Gopalan: SunEdison is growing at a rapid pace (almost 100 per cent year-on-year) and is continuously hiring new talent in all major functions including design and engineering, operations, field services and others. The employees get hands-on training as part of their job which makes them proficient in a particular skill set for a lifetime.

Apart from this, SunEdison has been very active in engaging with various colleges e.g. Anna University in Chennai to hire their 1st, 2nd and 3rd year students as interns. We have also set up a solar water pump R&D lab in Anna University where we train and work with a lot of engineering students who are interested to know more about the industry.

We have also set up a similar lab in the Global Academy of Technology (GAT) of Bangalore, and will continue to expand our reach to fresh talent in several colleges and universities.

IREF: Huge potential exists for solar rooftop installations in India's commercial consumer market. What are the challenges to tap this market?

Mr. Pashupathy Gopalan: The biggest challenges to growth in the rooftop market in India are related to the willingness of customers to sign long-term agreements of 15-20 years to buy power and allow access to their rooftop area. Since the asset is dedicated to a particular customer, this becomes essential.

IREF: In your opinion, what kind of an indigenisation plan is needed to develop a strong manufacturing base?

Mr. Pashupathy Gopalan: The government should focus on supporting development of fully integrated solar PV manufacturing base that needs to start with polysilicon manufacturing.

IREF: SunEdison recently acquired First Wind in the US as part of its foray in the Indian wind industry. Can you talk about the plans for wind energy in India?

Mr. Pashupathy Gopalan: Solar and wind are both 100 per cent clean and reliable renewable energy technologies.

SunEdison aims to become the world's leading renewable energy provider. With our recent acquisition of First Wind, a leading wind energy company in the US, we will be able to bring together First Wind's proven development and operational capabilities and SunEdison's global corporate infrastructure, development and finance experience. This will enable us to capitalise on the significant growth opportunities in the global wind power markets, including India. We are very actively looking at opportunities in the wind energy space in India but all are still at very early stages. We plan to have an installed base of 1 GW of wind in India in the next 3 years.

IREF: The First Wind acquisition was through SunEdison's yieldco TerraForm Power. The concept is new to India. What is a yieldco and how does the concept work in renewable energy business?

Mr. Pashupathy Gopalan: One of the major barriers to the deployment of renewable energy technologies is the lack of

capital. Renewable energy markets are heading towards a very interesting concept to solve the issue of capital with the emergence of YieldCos. A YieldCo is a separate growth-oriented, dividend-paying company that owns and operates a diverse portfolio of contracted clean power generation assets that yield high-quality tax-shielded cash flows through the revenue from selling electricity. This lets the YieldCo buy new plants as they go into production which in turn gives the developers, the capital to build projects. The renewable energy market is growing more than 15 per cent year-on-year and the combination of dividend yield, growth and clean tech exposure appeals to a broad pool of investors. So far, these YieldCos have been very well received. There have been issuances of six new renewable energy YieldCos so far in the US, raising a total of \$2.9 billion at IPO. These YieldCos are now trading with dividend yields of 2.5-6.5 per cent as a function of high growth prospects.

TECH TALK

Tesla's Low-Cost Battery Storage Range for Residential Use

The combination of rooftop solar and lithium ion battery storage is now cheaper than the grid – particularly in places with high electricity costs and good sun. And this has been made possible by none other than electric vehicle manufacturer Tesla. The company recently launched **Powerwall** – a home, business and utility battery storage range. The stand-alone rechargeable lithium-ion battery can be mounted on the wall and comes in 10 kWh weekly cycle (priced \$3,500) and 7 kWh daily cycle (\$3,000) models. Both models are guaranteed for 10 years and are sufficient to power most homes during peak evening hours. Multiple batteries may be installed together for homes with greater energy need, up to 90 kWh total for the 10 kWh battery and 63 kWh total for the 7 kWh battery.

Contained within Powerwall's outdoor-rated enclosure is a rechargeable lithium-ion battery, a liquid thermal management system, a battery management system and a smart DC-DC converter for controlling power flow. Powerwall will be first offered in Australia early next year. The battery is designed to store energy at a residential level for load shifting, backup power and self-consumption of solar power generation.

Salient features of Powerwall:

Technology: Wall mounted, rechargeable lithium ion battery with liquid thermal control.

Compatibility: Single phase and three phase utility grid compatible.

Models: 10 kWh, \$3,500 for backup applications; 7 kWh, \$3,000 for daily cycle applications

Operating Temperature: -4 F to 110 F / -20 C to 43 C

Warranty: 10 years

Enclosure: Rated for indoor and outdoor installation.

Efficiency: 92% round-trip DC efficiency

Installation: Requires installation by a trained electrician. DC-AC inverter not included.

Power: 2.0 kW continuous, 3.3 kW peak

Weight: 220 lbs / 100 kg

Voltage: 350 – 450 volts

Dimensions: 51.2" x 33.9" x 7.1" 300 mm x 860 mm x 180 mm

Current: 5.8 amp nominal, 8.6 amp peak output

Certification: NRTL listed to UL standards

Source: <http://www.teslamotors.com/powerwall>



INNOVATIVE FINANCING

GREEN BOND

Globally, capital market is playing an increasingly important role in climate change and sustainability as a new opportunity for investment. Since financing has always been an area of concern in the renewable energy space, devising innovative financing mechanisms has become imperative. Recently, Yes Bank and Export-Import Bank of India (Exim Bank) launched “Green Bonds”, a relatively new way to finance renewable energy projects.

A bond is a debt instrument that enables an entity to raise money from investors. The bond issuer gets capital while the investors receive fixed income in the form of interest. When the bond matures, the money is repaid. A Green Bond is similar with the only difference being that the proceeds are exclusively utilised for financing climate change mitigation or adaptation related projects or programmes. However, there is no standard international definition of green bonds as of now.

The growth of the Green Bond markets over the last few years has primarily been driven by the fact that there has been a greater focus on including environmental, social and governance issues into the decision process for investments by institutional investors. Green Bonds are issued by multilateral agencies such as the World Bank, corporations, government agencies and municipalities. Institutional investors and pension funds also have appetite for such bonds. For instance, investment funds BlackRock and PIMCO have specific mandates from their investors to invest only in bonds which fund green projects. Indian firms like Indian Renewable Energy Development Agency Ltd and Greenko have in the past issued bonds that have been used for financing renewable energy, however, without the tag of green bonds.

Green Bonds are important to India keeping in mind its ambitious 175 GW target of RE capacity by 2022 and the massive \$200 billion funding required in meeting this goal. Currently, the country has just over 30 GW of

installed RE capacity.

175 GW looks like a formidable task considering the high interest rates and unattractive terms under which debt is available in the country. This aspect raises the cost of renewable energy by 24-32 per cent¹ compared to similar projects being financed in the US or Europe. In a market where options for raising funds are limited, Green Bond fits the bill. The driving factors behind Green Bonds are lower interest rates than loans offered by commercial banks and ability to offer better returns for independent power producers.

Green Bonds have been a hit globally. A report by Bloomberg New Energy Finance mentions that the year 2014 saw a record \$38.8 billion being issued in Green Bonds. This was 2.6 times more than the \$15 billion issued in the previous year. This figure can touch \$100 billion in 2015 with Green Bonds expected to become mainstream financing instrument in 2016, based on a USAID presentation on *Green Bonds for Financing India's Clean Energy Needs* under its PACE-D technical assistance programme. The presentation reveals that issuances with over \$500 million size are increasing rapidly - 31 issuances in the last 2 years compared to 6 during previous 6 years (2006-2011).

However, the downside from an Indian perspective to participate in Green Bond issuances in foreign currencies is the high cost of hedging and low sovereign credit ratings. Moreover, regulations with respect to the external commercial borrowing (ECB) guidelines present certain challenges for the use of earnings from Green Bonds. Most importantly, interest on ECBs could be subject to double taxation, first locally² and secondly in the bond issuer's country. If double taxation could be avoided, green bond issuance will get more attractive.

Footnotes:

¹ Climate Policy Initiative: Meeting India's Renewable Energy Targets: The Financing Challenge

² Withholding tax

State At A Glance - TELANGANA

On 2nd June, 2014, Telangana was separated from Andhra Pradesh as the 29th State of India. Hyderabad will serve as a joint capital for both Telangana and Andhra Pradesh for 10 years during which time Andhra Pradesh will build a new capital. The historical connection of the event goes back 57 years when in November 1956 Telugu-speaking Telangana region of Hyderabad was merged with Andhra State.

Telangana is a mineral-rich State, with good hydro and coal reserves. The power requirements of the region are met through hydro and thermal power projects. The State government plans to put up new power projects to build additional power generation capacity. Post bifurcation of Andhra Pradesh, the Telangana government set up Telangana New and Renewable Energy Development Corporation Ltd to implement non-conventional energy projects and spread awareness about energy conservation.

Based on data from CEA, the renewable energy component in the total energy mix presently stands at a meager 8.4 per cent. However, since its formation, the

State of Telangana has made sincere efforts in promoting renewables. During the RE-Invest conference by the Ministry of New and Renewable Energy, Telangana received the award for “Outstanding Performance in Promotion of Renewable Energy”. In March 2015, the State government invited bids for 1,000-MW solar PV projects in line with its target to develop 5,000 MW of solar energy projects in the next five years. Though the net energy gains from wind energy are very low, initiatives are on to harness the resource effectively. The government is receiving proposals from companies interested in setting up wind energy projects in the State.



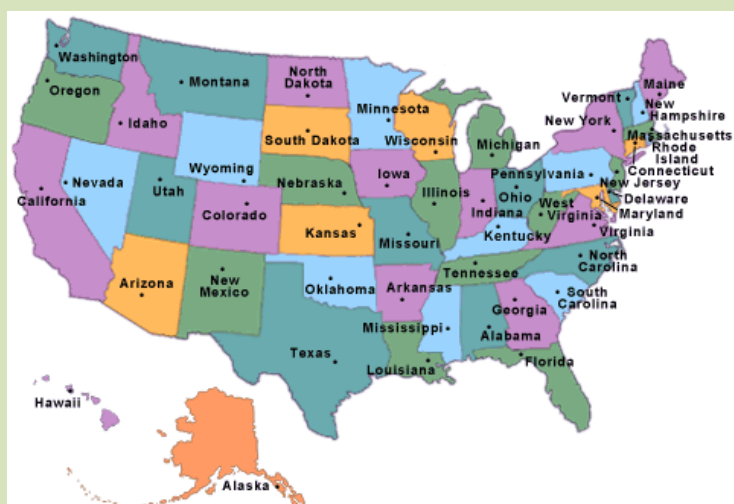
Installed capacity (in MW) of power utilities in Telangana (including allocated shares in joint and central sector utilities)

Ownership sector	Mode-wise break-up							Grand total
	Thermal				Nuclear	Hydro	Renewable Energy	
	Coal	Gas	Diesel	Total				
State	3,175.47	0.00	0.00	3,175.47	0.00	2,012.54	119.11	5,307.12
Private	270.00	1,697.75	19.83	1,987.58	0.00	0.00	705.66	2,693.25
Central	1,584.68	0.00	0.00	1,584.68	148.62	0.00	0.00	1,733.30
Total	5,030.15	1,697.75	19.83	6,747.73	148.62	2,012.54	824.78	9,733.66

Source: CEA data up to 28 February, 2015; Renewable energy data from MNRE as on 31st March, 2014

Country At A Glance – UNITED STATES OF AMERICA

The United States is home to the world's largest estimated recoverable reserves of coal and has energy sector as its third largest industry. The country also has the largest installed nuclear power capacity. In the oil and gas segment, the US is experiencing major transformation due to production from shale formations. The US electric power sector has as such undergone structural shift due to availability of cheap natural gas as well as increasing share of renewables.



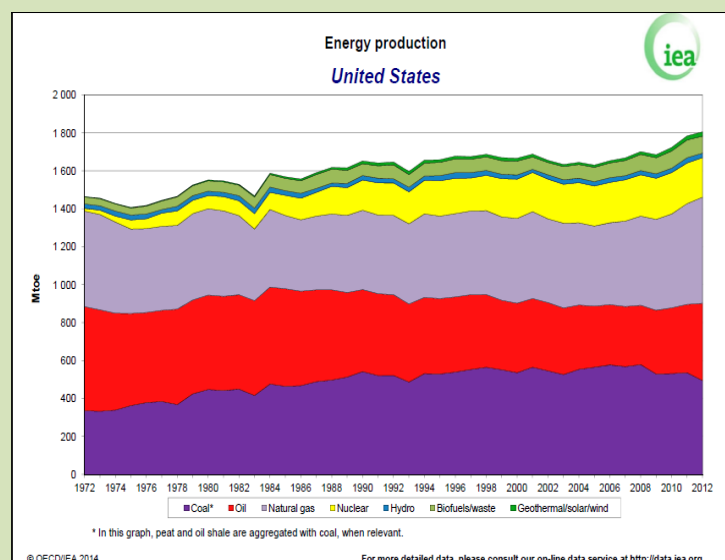
Till December 2014, the US had generated 1,81,791 million kWh of electricity from wind energy and 18,321 million kWh from solar energy. The total electricity generation from all energy sources in the country during the January-December 2014 period stood at 4,092,935 million units. The table on next page reflects that barring conventional hydroelectric power, the share of wind power is the highest among renewables.

There have been many build-out phases in the US electricity generating capacity – During the 1949 to 1983 period, coal-fired power plants formed a major part of additions to US electricity generating capacity. For a short period thereafter, nuclear power became the major contributor to annual capacity growth before being surpassed by natural gas that has been the key contributor ever since. Most of the added US capacity between 1990 and 2005 was from natural gas power plants. The US energy production scenario for the period from 1972 to

2012 is very well illustrated in a graph by the International Energy Agency. The renewable energy trajectory depicts that there has been a consistent increase in the capacity addition during the years with geothermal, solar and wind finding a strong footing.

Based on the latest *Energy Infrastructure Update* report from the Federal Energy Regulatory Commission's Office of Energy Projects, solar, wind, biomass, geothermal, and hydro power provided 55.7 per cent of new installed electrical generating capacity in the US during the first half of 2014 (1,965 MW of the 3,529 MW total installed).

Solar alone accounted for about a third of new US generating capacity thus far in 2014: 32.1 per cent (1,131 MW). Wind provided 19.8 per cent (699 MW), followed by biomass (2.5 per cent – 87 MW), geothermal (0.9 per cent – 32 MW), and hydropower (0.5 per cent – 16 MW). Most of the balance (1,555 MW – 44.1 per cent) of the new generating capacity was provided by natural gas while no new coal or nuclear power capacity was reported. A comprehensive study by the Department of Energy's National Renewable Energy Laboratory (NREL) predicts that the US can generate most of its electricity from renewable energy by 2050.



Source: <http://www.iea.org/stats/WebGraphs/USA3.pdf>

Net Electricity Generation across All Sectors in 2014 (in Million kWh)

Year	Fossil Fuels				Nuclear Electric Power	Hydroelectric Pumped Storage ^e	Renewable Energy					Total ⁱ	
	Coal ^a	Petroleum ^b	Natural Gas ^c	Other Gases ^d			Conventional Hydroelectric Power ^f	Biomass		Geothermal	Solar/PV ^g		Wind
								Wood ^g	Waste ^h				
Total (From Jan till Dec 2014)	1,585,697	30,489	1,121,928	11,578	7,97,067	-6,209	2,58,749	43,050	21,269	16,628	18,321	1,81,791	4,092,935

Footnotes:

^a Anthracite, bituminous coal, subbituminous coal, lignite, waste coal, and coal synfuel.

^b Distillate fuel oil, residual fuel oil, petroleum coke, jet fuel, kerosene, other petroleum, waste oil, and, beginning in 2011, propane.

^c Natural gas, plus a small amount of supplemental gaseous fuels.

^d Blast furnace gas, and other manufactured and waste gases derived from fossil fuels. Through 2010, also includes propane gas.

^e Pumped storage facility production minus energy used for pumping.

^f Through 1989, hydroelectric pumped storage is included in "Conventional Hydroelectric Power."

^g Wood and wood-derived fuels.

^h Municipal solid waste from biogenic sources, landfill gas, sludge waste, agricultural byproducts, and other biomass. Through 2000, also includes non-renewable waste (municipal solid waste from non-biogenic sources, and tire-derived fuels).

ⁱ Solar thermal and photovoltaic (PV) energy.

^j Includes batteries, chemicals, hydrogen, pitch, purchased steam, sulfur, miscellaneous technologies, and, beginning in 2001, non-renewable waste (municipal solid waste from non-biogenic sources, and tire-derived fuels).

EVENTS ACROSS THE GLOBE TO LOOK OUT FOR...

Asia Clean Energy Forum

15 - 19 June, Manila, Philippines

The Asian Development Bank (ADB), US Agency for International Development (USAID), World Energy Council (WEC), and Korea Energy Management Corporation (KEMCO) will be hosting the 2015 edition of Asia Clean Energy Forum at ADB Headquarters in Manila. This year's conference will feature a number of exciting new events, while continuing the tradition of bringing together members of Asia's clean energy community

Please visit: <http://www.asiacleanenergyforum.org/>

Bangladesh Off-Grid Appliance & Clean Energy System Industry Networking Event

31 July 2015 - 1 Aug 2015, Dhaka, Bangladesh

The Off-Grid Appliance & Clean Energy System Industry Networking Event, organised by Global LEAP and the Bangladesh Solar and Renewable Energy Association (BSREA), will be held in Dhaka. Replicating the format of a high impact event at the fifth Clean Energy Ministerial in Seoul, Korea, in May 2014, this event will convene international off-grid industry leaders – including Bangladeshi solar home system companies and Winners and Finalists of the Global LEAP Awards 2014 Outstanding Off-Grid Appliances competition – to meet and explore ways to collaborate and grow in the fast-growing off-grid solar and appliance market.

To register, please visit the following URL: <http://bit.ly/1Bl6vj0>