

INSIDE

The [decision](#) by the U.S. Supreme Court to halt President Barack Obama's Clean Power Plan is unlikely to smother renewable energy, as individual states follow their own targets and costs for wind and solar energy continue to drop.

China raised twice as much as Europe in the [project financing](#) of renewables in 4Q 2015, despite some significant European offshore wind deals.

Tesla Motor Co.'s [Model 3](#) will be unveiled March 31, and production will begin late next year, according to Chief Executive Elon Musk.

Q&A: A future where customers pay for lighting under a complete energy-service offering from their utility, is an upcoming [business model](#) being discussed by Philips Lighting, a unit of **Koninklijke Philips NV**. Together with a company aim to reach carbon neutrality by 2020.

PHRASE OF THE WEEK:

Climate Solutions Caucus: Carlos Curbelo, a Republican congressman for Florida, and Ted Deutch, a Democrat congressman for Florida, have created a new bipartisan [House task force](#) on climate change, seeking to propose clean energy legislation in the next two months.

SCIENCE BUZZ

Plankton networks in the ocean have an important role in removing carbon from the atmosphere and depositing it deep at sea, according to a [study](#) by Ohio State University. A team of 200 scientists used genetic sequencing to identify which clusters of ocean inhabitants were most linked to depositing carbon in the depths. The abundance of certain bacteria and viral genes can predict variation in sinking carbon. Understanding these will give scientists a better grasp of how the ocean ecosystems interact with carbon.

Pakistan's 'Immense Potential' to Be \$1B-a-Year Market

BY VANDANA GOMBAR,
BLOOMBERG NEW ENERGY FINANCE

Pakistan should be one of the next emerging economies to break through the \$1 billion-a-year investment barrier for renewable energy excluding large hydro, the head of the country's government agency promoting green power said.

In 2015, the Asian nation of 182 million people attracted a record \$720 million of investment in wind and solar, according to Bloomberg New Energy Finance, and it is now starting to attract interest from more foreign companies.

"We recently conducted some roadshows to promote investments... We received a very good response from the U.S., from Europe and from China as well," Amjad Ali Awan, chief executive officer of Pakistan's Alternative Energy Development Board, said in a telephone interview.

China is currently leading clean energy investments in the power-deficit country under the China-Pakistan Economic Corridor. The 900-megawatt solar project of China's Zonergy is progressing as per schedule, with the first 300-megawatts to be commissioned in about three months. In addition, another 650-megawatts of wind and solar projects are in line to achieve financial close this year. Denmark's **Vestas Wind Systems A/S** [said this month](#) that it would help Pakistan's Punjab government obtain \$2.2 billion in financing for building 1 gigawatt of wind projects in that state.

Investor interest has not been dampened by the recent fall in electricity prices, which are linked to the price of fossil-fuels. Industrial tariffs for instance were cut by about 20 percent or PKR 3 per unit on January 1 2016. "I don't think that changes the appetite for renewables," Awan said. He underlined the main draw for investors: an assured 17-18 percent return-on-equity.

Pakistan relies on fossil fuels (natural gas, oil, diesel) for over two thirds of its electricity, with large hydro providing the balance. AEDB is pushing for the share of renewables excluding large hydro to be raised to as much as 20 percent of overall electricity generation. Limited transmission capabilities, land acquisition difficulties and security concerns could pose obstacles to renewables expansion. [Read the Q&A.](#)



Source: Pakistan Alternative Energy Development Board
Amjad Ali Awan

Mexico, Chile Surge Ahead in Clean Energy Investment



Source: Bloomberg New Energy Finance

Latin America and Caribbean total clean energy investment by country, 2004 to 2015.

Investment in Mexico and Chile increased by 111% and 143% respectively from 2014 to 2015.

Q&A

Clean Energy and Carbon Brief's **Vandana Gombar** interviewed **Amjad Ali Awan**, of Pakistan's Alternative Energy Development Board, about the country's potential for renewable energy investment, particularly for wind and solar power.

Q: Do you think renewable energy investments in Pakistan could leap the \$1 billion barrier this year?

A: The potential is immense. We are receiving a good response from investors, despite the reduction in solar feed-in tariffs effective on 1 January.

On the wind side, only one corridor in the southern side is active right now. The potential there is 35,000 megawatts, and only 300 megawatts have reached commercial operation so far. Nine projects with about 479 megawatts of capacity have achieved financial close and are under construction, while another 560-megawatts of projects are at different stages of development. In solar, a 100-megawatt plant is operational, while another one of 300 megawatts has achieved financial close. In the next three months, it is likely that commercial operation will be achieved.

Q: The largest chunk of renewables investment is coming from China, some of it under the \$45 billion China-Pakistan Economic Corridor, or CPEC. How is that progressing?

A: It is proceeding as per targets. The projects that are in CPEC – wind projects of 200 megawatts and 900 megawatts of solar – will achieve commercial operation in time. There are 34 energy projects under CPEC.

Q: Which are the other countries active and interested in investing in the renewable energy sector in Pakistan?

A: We recently conducted some roadshows to promote investments, including in the U.S. We received a good response from there and from Germany as well. The good thing about Pakistan is we have a very clear policy, and that policy has been working for the last 20 years. The documentation is evolved. Those are bankable documents. We are ensuring around 17-18 percent return on equity. We have very generous fiscal incentives for investors. That is why we

are receiving a very good response from the U.S., from Europe and from China as well.

Q: What could be the main hindrance to faster rollout of renewable energy?

A: Wind is site-specific. We need certain modifications in the transmission system to evacuate wind power from the southern part of the country. That is a key challenge for us. A recent study shows that existing transmission lines allow us to inject around 2,312 megawatts by 2017 – some 1,234 megawatts from wind and 1,078 megawatts from solar PV. Another 9,332 megawatts of renewable energy (5,455 megawatts of wind and 3,877 megawatts of solar) can be added by 2022, subject to construction of new transmission infrastructure. However, the new capacity addition will be done keeping in view the impact on the basket tariff. We have a policy for private sector investment in transmission lines also.

The biggest hurdle in Pakistan, as perceived by foreign investors, is land. Land is a provincial subject. This time, the federal government has signed coordination agreements with provincial governments regarding land-related risks and issues.

Q: Renewables are getting cheaper but so are gas, oil and coal. Electricity tariffs in Pakistan have been reduced under fuel price adjustment. Does that impact Pakistan's appetite for renewables?

A: No, I don't think that changes the appetite for renewables. Although the solar tariff was reduced by the regulator, the investor response has not been affected. Whatever the tariff, we ensure 17-18 percent return on equity to the sponsor.

Q: What is the target share of renewables in the overall electricity mix?

A: We are aiming for a 15 percent or 20 percent share of renewables in our energy mix. The potential is there, the tariff is attractive and investors are responding. The only missing link could be the transmission lines, and we are working on this. We have proposed this to the government.

Commissioned:

Wind — 300 megawatts
Solar — 100 megawatts

Financing secured and under construction:

Wind — 479 megawatts
Solar — 300 megawatts

Financing likely this year:

Wind — more than 400 megawatts
Solar — more than 250 megawatts*
*excluding Zonergy's 600 megawatts

Q: Net metering is one way to bypass the transmission infrastructure limitation. By when are we likely to see the first such plants?

A: Net metering is a budding concept in Pakistan right now. We collaborated with the regulator, which issued the guidelines in September. That is a key milestone achieved. Consumers' main interface will be with the distribution companies, and we are talking to them to help them accommodate the concept. We have to market this idea and help rollout.

Q: What are 2016's policy priorities?

A: We are trying to promote biomass including bagasse, which is potentially a big space. Geothermal potential is also immense in Pakistan. It is a new sector, and we need to create an enabling environment for it, and develop it. Small hydro (less than 50 megawatts) will be our other focus area. In addition, we are mapping resources for solar, wind and biomass.

Q: There is a global trend away from feed-in tariffs. Is there any plan to introduce competitive bidding for projects in Pakistan?

A: Pakistan's policy relating to renewables is very flexible; both the modes of project development are covered. Developers can opt for an upfront tariff or cost-plus tariff. We are receiving more responses under the feed-in tariff regime.

Q: How do you respond to investor queries on security risks in Pakistan?

A: The question is asked, but actual ground realities have changed. Pakistan is a much more secure place than before. I don't think this is a major concern for investors right now.