

# Is the clean energy transformation irreversible?

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In a policy forum paper published by the journal *Science* on 9 January 2016, outgoing American President Barack Obama gave four reasons why he believes the trend toward clean energy is irreversible, even in the face of anticipated opposition from the incoming administration of climate change-denying President-elect Donald Trump.

Obama asserted that economic growth has been successfully decoupled from energy sector emissions, that the private sector is now driving the clean energy transition independent of government initiatives and subsidies, that the American power sector is being transformed in large part due to market dynamics, and that global momentum will not be slowed by a policy shift from the US government.

## Motion of the ocean

In the first six months of 2016, energy-related carbon dioxide emissions were the lowest they had been for a first half since 1991 at 2.53 billion metric tons, according to the US Energy Information Administration (EIA). The agency credited mild weather, changing fossil fuel consumption mix, and increasing renewable energy consumption.

Before the year was through, the nation's first offshore wind farm was established with more such projects in development, even if one offshore wind developer (Fishermen's Energy) has had some setbacks.

Meanwhile, utilities made significant progress toward lowering carbon footprints and have been vocal about their plans to continue to do so regardless of what are seen as short-term political upheavals. Berkshire Hathaway subsidiary Mid American Energy's planned 2GW wind farm in Iowa – the largest endeavored in the US to date – was approved by regulators and Minnesota's utility commission approved Xcel Energy's plan to add 1.8GW of wind power and 1.4GW of solar to its portfolio as a coal replacement and a way to meet new demand by 2030.

Xcel Energy vice-president of policy and federal affairs summed up the sentiments of many US utilities late last year when he said that "regardless of the outcome of the election, Xcel Energy will continue to pursue energy and environmental strategies that appeal to policymakers across the political spectrum because we are focused on renewable and other infrastructure projects that will reduce carbon dioxide emissions without increasing prices or sacrificing reliability."

Federal Energy Regulatory Commission (FERC) and US EIA statistics suggest that roughly 21GW of wind and solar power – including both utility-scale and rooftop – were installed throughout the year, accounting for 68% of new capacity added. *IJGlobal* data shows that during President Obama's eight-year term, nearly 440 renewable energy projects were brought into operation, after just over 100 during the term of his predecessor George W Bush. What's more, roughly 5.3GW of aging power plants were planned for retirement last year, and many coal plant operators say they will continue to decommission coal plants as planned despite the prospect of a favourable climate for the resource.

In 2017, PNM Resources has not altered its plan to decommission an 837MW New Mexico coal plant and to replace that capacity with wind and solar. The Tennessee Valley Authority confirmed post-election plans to shut down two plants this year and another next year, and Colorado-based Tri-State Generation said it will move forward with the shuttering of the 100MW Nucla coal plant and Unit 1 of its Craig coal plant.

### **State of change**

By any measure, the power sector in the US is undergoing a significant shift toward cleaner fuels, cleaner turbines, and fuel-free generation. In a post-election round-up, many in the renewable power project finance space told *IJGlobal* that while federal policy may shift away from renewable energy support in the coming four years, states and corporations are likely continue to push the industry forward.

In Illinois, the state legislature enacted a new energy bill expected to double its energy efficiency portfolio and allow for 4.3GW of new solar and wind while at the same time supporting continued reliance on nuclear power. Other states have followed similar policy pathways, with Washington passing a carbon tax into law, and California Governor Jerry Brown adamantly defending the state's climate stance.

Not all states are jumping on the renewables bandwagon, however. In Wyoming already this year, a handful of legislators led by Senator Larry Hicks submitted Senate File 71, which would effectively ban the use of renewable resources larger than the 25kW net metering systems defined by state law.

On the corporate front, more and more companies are wising up to the benefits of direct procurement, following in the footsteps of companies like Google (which boasts renewable power and carbon offsets equal to its total footprint) and Amazon. In a show of force, hundreds of American corporations signed on in support of the Clean Power Plan.

### **Taking off the training wheels**

According to the 10th annual levelised cost of energy analysis published by Lazard in December 2016, greenfield wind and solar generation facilities are able to compete with even the most efficient fossil fuel generation resources without the need for subsidies.

While many factors were not considered in the Lazard analysis, such as that many renewables are competing with established power generation that can continue to operate for years or even decades with only minimal further investments, on a cost per MWh basis, the low end of the wind power pricing spectrum fell far below that of any other resource at \$32 per MWh. That compares to utility-scale solar at \$46 to \$49 per MWh (depending on the technology), combined-cycle gas at \$48 per MWh, coal at \$60 per MWh and nuclear at \$97 per MWh.

Supporting this analysis, several conversations with market participants, especially in California and Texas, have revealed strong confidence in renewables' ability to compete without subsidy training wheels against fossil fuels on the open market.

Power projects will always be financed with an eye toward returns. So as the economics of renewable energy projects continue to become more favorable, it is unlikely that investors will eschew the sector simply because they want to help Trump make good on campaign promises to save coal country.

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