

What Do Trump's Policies Mean for Energy and the Climate?



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President-elect Donald Trump's energy policies mark a profound departure from those of his predecessor. A vocal climate change skeptic, he vows to reduce regulations which limit the production and use of fossil fuels, re-initiate Keystone XL, and if possible, exit the Paris Agreement.

Growth in renewable energy may lose momentum, but some encouraging drivers remain. Renewable Portfolio Standards, for instance, mandate implementation of renewables at the state level and have little to do with the policies of the federal government. The costs of wind and solar continue to drop. Renewable energy tax credits like the solar ITC and wind PTC enjoy bipartisan support. Each of these factors is highly important for the development of the sector and unlikely to change abruptly. Beyond renewables, Trump's increased support for up- and mid-stream oil and gas infrastructure could lead to greater gas supply and further depress the demand for carbon-intensive coal.

However, pulling out of or failing to comply with the Paris Agreement, or perhaps the UNFCCC, would call the credibility and good faith of the United States into question. Failure to make progress towards the targets set by these agreements places the entire planet in danger.

Prior to the election, the global outlook on clean energy and climate change felt more optimistic than ever. With Trump set to become president of the U.S., the tone has changed and a more realistic stance prevails. Local, state, and economic factors will still foster the development of clean energy even if federal support falters, but it remains unclear to what extent Trump's policies will counterbalance these drivers.

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Donald Trump's campaign was characterized by uncertainty and his election implies that more will ensue. While some look forward to the possibility of high growth rates and major infrastructure renewal programs, other are concerned at the prospect of unabated carbon emissions and their effect on climate change.

President-elect Trump's climate promises are largely related to repealing, canceling, or ignoring the climate measures put in place under President Obama. Some commitments are deliberate rejections of his predecessor's policies (cancelling/refusing the Paris Agreement, dismantling the U.S. Environmental Protection Agency), while others are indirect (appointing conservative, climate change skeptics as lawmakers).

While the split of power between federal and state governments has been occasionally problematic for the development of renewable energy over the past eight years, states' ability to continue to work towards their energy objectives (like Renewable Portfolio Standards) without intervention from the federal government is now a source of comfort for those concerned about the climate. Renewables are also becoming more economically viable every day, while coal is becoming less so. Trump's pro-fracking policies would favor plentiful, inexpensive gas as opposed to coal, even in the absence of carbon emissions regulation.

1. Agreements, Regulation, and Legislation

1.1 International Agreements

The Paris Agreement

In December 2015, more than 190 countries adopted the Paris Agreement, though at least 55 countries representing at least 55 percent of global emissions needed to ratify the agreement for it to enter into force. In part due to the possibility of a Trump presidency, ratification accelerated and the Agreement took effect on November 4, 2016.

Most notably, the U.S. (16.4% of global greenhouse gas emissions in 2015, according to the BP Statistical Review of World Energy 2016) and China (27.3%) agreed to ratify the agreement following a meeting in September 2016 in which U.S. President Barack Obama and Chinese President Xi Jinping affirmed their commitment to working together in climate action and leadership. (Note that the Senate, however, has still not ratified.)

The Paris Agreement is certainly the most promising climate agreement to date. It lacks a binding enforcement mechanism, but instead requires countries to wait three years after the agreement goes into effect before they can pull out, which then takes an additional year. As a result, there is little that President-elect Trump can do to escape the agreement (at least during his first term) despite his promises to abandon it.

The UN Framework Convention on Climate Change

There is, in theory, another possibility: exiting the United Nations Framework Convention on Climate Change (UNFCCC). This established national greenhouse gas inventories, and led to the COPs, the Kyoto Protocol, the Cancun Agreements, and the Paris Agreement.

Should the U.S. choose to exit the UNFCCC, which seems within the range of possibility given Trump's anti-UN, anti-regulation stance, the exit could be completed in a year. The U.S. would then no longer be a part of the

"We're going to cancel the Paris Climate Agreement and stop all payments of U.S. tax dollars to U.N. global warming programs."

- Donald Trump,
May 26, 2016 in
Bismarck, ND

Paris Agreement, nor would it be required to publish GHG inventories. Especially given that the UNFCCC was signed by George H.W. Bush, a Republican, and has withstood three administrations, withdrawing from this treaty could send a particularly negative message to both Americans and the international community.

Non-Participation

Perhaps the most probable outcome is non-participation: the Trump administration would send observers to any negotiations and simply refuse to meet targets set during the conferences, ultimately submitting a business-as-usual action plan as required by the Paris agreement to comply with international law.

The latter two means by which the U.S. could avoid meeting its GHG reduction commitments would call the credibility and good faith of the United States into question, potentially alienating American lawmakers, other countries, and world leaders. Most importantly, it jeopardizes the commitments to climate action made by other heavy emitters, and therefore, the welfare of the entire planet.

1.2 The U.S. Environmental Protection Agency

President-elect Trump has made his views on climate change clear: it is fictitious, and he openly desires dismantlement of the Environmental Protection Agency. His pick to lead the EPA transition team is Myron Ebell, currently the director of the Center for Energy and Environment at the conservative Competitive Enterprise Institute. He has been a central figure in promoting climate change denial to the American public, stating that "the U.N. Intergovernmental Panel on Climate Change is an organized conspiracy dedicated to tricking the world into believing that global warming is a crisis that requires a drastic response."

The EPA is the agency charged with implementing laws such as the Clean Air Act and Clean Water Act, which have been passed by Congress. It studies pollutants that are harmful to human health, writes rules to curb those pollutants, and monitors compliance. Without it, states would be left to individually determine their pollution regulation: some might seek to attract dirty industries, while others might sue the federal government for failing to meet its obligations. Both environmental and human health are at stake.

The Clean Power Plan

One of the key tenets of President Obama's Climate Action Plan is the EPA's Clean Power Plan (CPP), which aimed to cut carbon pollution from the power sector (responsible for about one-third of domestic GHG emissions) by 32% in 2030 compared to 2005 levels. It also would cut pollution leading to soot and smog by over 25% in 2030.¹

In February 2016, the CPP was put on hold after 27 states and several companies opposed it on the grounds that the EPA overstepped its authority under the Clean Air Act. The Supreme Court voted 5-4 to put a hold on the CPP, so the subsequent death of Antonin Scalia led to a 4-4 split between liberal and conservative justices. As such, the next Supreme

¹ U.S. Energy Information Administration 2015: *Clean Power Plan for Existing Power Plants*

"Environmental Protection, what they do is a disgrace. Every week they come out with new regulations.

*- Donald Trump,
October 18, 2015 on
FOX News*

Court nominee appointed will be the deciding factor in the future of the Clean Power Plan.

President Obama nominated Merrick Garland shortly after Scalia's death, but Senate Republicans have refused to confirm his choice. Instead, they have argued that the voters' choice for president in November should appoint the new justice. Their obstruction paid off, as Trump will nominate conservative justice who will certainly be confirmed by the Republican-majority Senate. Particularly when combined with the climate-skeptic director / eventual dissolution of the EPA, this means the Clean Power Plan is unlikely to be realized in its current form.

On a more optimistic note, the CPP came about due to a landmark case: Massachusetts v. EPA, in which several states and organizations brought suit against the EPA in order to force it to regulate carbon dioxide and other GHG as pollutants. The CPP is a direct result of this case, and judges are bound to the precedents established in previous cases. So, CPP is likely to be amended or rewritten entirely, but GHG emissions will probably be regulated as the court mandated in Massachusetts v. EPA. This suit included the states of California and New York on the prosecution, both of which have enormous political power; while the CPP may be transformed due to the factors previously described, it unlikely that GHG emissions will escape regulation entirely.

"I'm fine with it [the PTC] ... Wind will need subsidies. It's going to have to have subsidies."

-Donald Trump

November 19, 2015 on American Bridge

"Ugly industrial wind turbines are ruining the beauty of parts of the country--and have inefficient unreliable energy to boot."

-Donald Trump (@realDonaldTrump)

May 11, 2012 on Twitter

1.3 Renewable Energy Tax Credits

The Investment Tax Credit (ITC) and Production Tax Credit (PTC) have been major contributors to the growth of renewable energy in the United States. The ITC is most commonly applied to large-scale solar and provides a tax rebate equivalent to 30% of system cost.² The PTC is typically applied to wind systems, and provides a \$23/MWh tax credit for ten years (compare to typical U.S. wholesale electricity prices of about \$30/MWh in 2016).³ Both tax credits are set to phase out in the coming years.

These are established incentives with bipartisan support, but could be repealed prior to expiration through legislation. Trump once stated his support for the Production Tax Credit but has since pivoted, disparaging wind power as being expensive, ugly, and harmful to birds. He does not support solar power due to its cost, but has never spoken about the Investment Tax Credit.

These tax credits are unlikely to be repealed on ideological grounds (though tax reform might pose a threat). Cancellation of the credits would not necessarily halt industry growth, however; renewable energy is appealing to both parties, not to mention the public. Perhaps contrary to popular expectation, Texas, a Republican stronghold, has the most installed wind capacity of any state, and the PTC and ITC were created under Presidents George H.W. and George W. Bush. While renewables lead to environmental benefit, they can also play a prominent role in ensuring energy security and reducing dependence on foreign resources. These are principles that Republicans, Democrats, and Independents can all agree on.

² United States Department of Energy: Business Energy Investment Tax Credit (ITC), 2016

³ United States Department of Energy: Renewable Electricity Production Tax Credit (PTC), 2016

1.4 Renewable Portfolio Standards

Renewable Portfolio Standards (RPS) mandate sourcing a fixed portion of a state's electricity from renewables and have given rise to the green power market. Based on tradable Renewable Energy Certificates, which aim to track the positive environmental externalities of renewable power, RPS are present in 30 states and vary in stringency.

For example, California seeks to obtain 50% of its power from renewable sources by 2030, and Hawaii looks to obtain 100% by 2045. Illinois' standards are technology-based, and stipulate that 25% of electricity sold in 2026 must be obtained via solar and wind. New York requires utilities to procure 50% of the state's electricity from clean energy sources by 2030.⁴

Where present, RPS have been highly influential in reducing the carbon intensity of states' power sectors. Since RPS are decided at the state level, any changes in federal legislation or regulation would not affect them. The 2016 election did not represent an enormous shift in the control of state legislatures, so RPS are here to stay.

2. Economic Factors

2.1 Falling Costs for Renewables

Even without incentives or subsidies, renewables are becoming less expensive and more efficient, therefore reaching a cost level competitive with fossil fuels.

Solar module costs have decreased 75% in the last five years due to falling polysilicon prices, advancements in technology, higher capacity factors, and economies of scale. For the same reasons, every time cumulative installed solar capacity doubles, prices fall by about 25%. There is still sizeable potential for solar panel price reductions, and costs are expected to continue to fall in coming years.⁵

Onshore wind is a more mature technology, now competitive with fossil fuels in some parts of the United States. Turbine costs have fallen while their capacity factors have increased, and the cost of wind power has decreased 58% over the past five years as a result. Every time global cumulative installed wind capacity doubles, there's a 19% drop in cost.⁶

These trends indicate that installation of renewables might slow in the absence of subsidies, but would not stop altogether. Meanwhile, the economics of coal are unfavorable for reasons largely unrelated to regulation: inexpensive natural gas and, to a somewhat lesser extent, renewables.

2.2 Competition Continues Between Gas and Coal

Trump has stated his support for large, controversial projects like Keystone XL and the North Dakota Access Pipeline; he has stated his intention to reinstate the former quickly post-inauguration. A renewed focus on large

"If I Am Elected President I Will Immediately Approve The Keystone XL Pipeline. No Impact On Environment & Lots Of Jobs For U.S."

-Donald Trump (@realDonaldTrump), August 18, 2015 on Twitter

⁴ NC Clean Energy Technology Center: DSIRE (Database of State Incentives for Renewables & Efficiency)

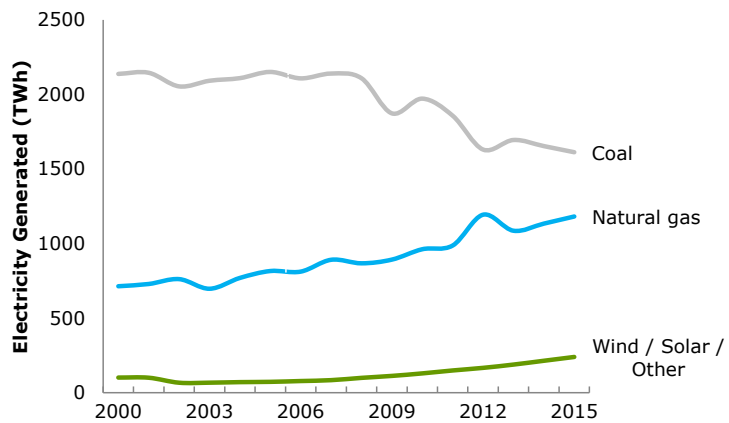
⁵ U.S. Department of Energy 2015; National Renewable Energy Laboratory 2016

⁶ American Wind Energy Association 2016; National Renewable Energy Laboratory 2015. U.S. Department of Energy 2015; National Renewable Energy Laboratory 2016

energy infrastructure may to significantly benefit the upstream and midstream oil and gas sectors.

Trump’s promises to revitalize the American coal industry will be difficult to achieve, however, particularly if more gas and oil infrastructure is put into place. Though many blame climate regulation for the decline of coal, the decline of the industry is also related its diminishing economic viability. Fracking produces an enormous quantity of inexpensive natural gas and coal is becoming less competitive as a result. In a market where energy demand remains flat, any new generation implies decline of another; in this case the growth of gas and, to a lesser extent, renewables comes largely at the expense of coal.

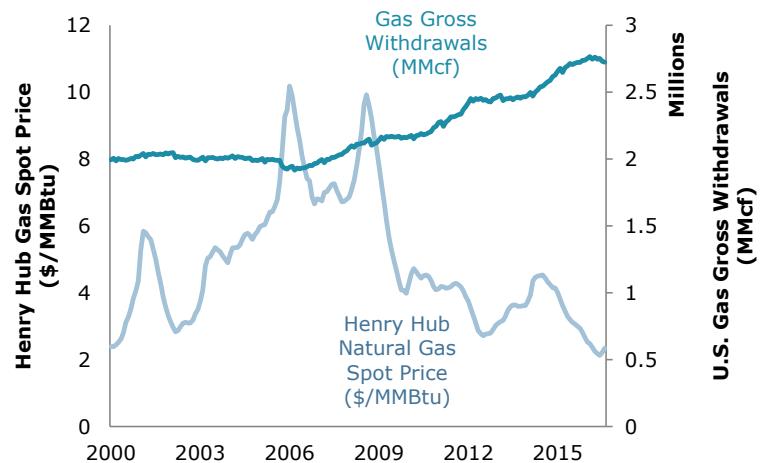
U.S. Electricity Generation, 2000-2015



Source: Mirova/ International Energy Agency 2015/ U.S. Energy Information Administration 2016

The data presented in the chart above is annual; it therefore obscures the fact that electricity generation from natural gas surpassed generation from coal for the first time ever in April 2015. Overall, coal still provides the bulk of the generation (and is projected to continue to play an important role with or without federal regulation like the CPP), but the gap between it and gas is narrowing.

U.S. Natural Gas Spot Price and Production, 2000-2016



Source: Mirova / U.S. Energy Information Administration 2016

Even after lifting the moratorium on federal lands and lightening regulation, it remains to be seen whether production of gas will be attractive from an economic standpoint. Unless exports increase substantially, the current low-price environment may not become more favorable for producers when supply is already plentiful and domestic demand remains level.

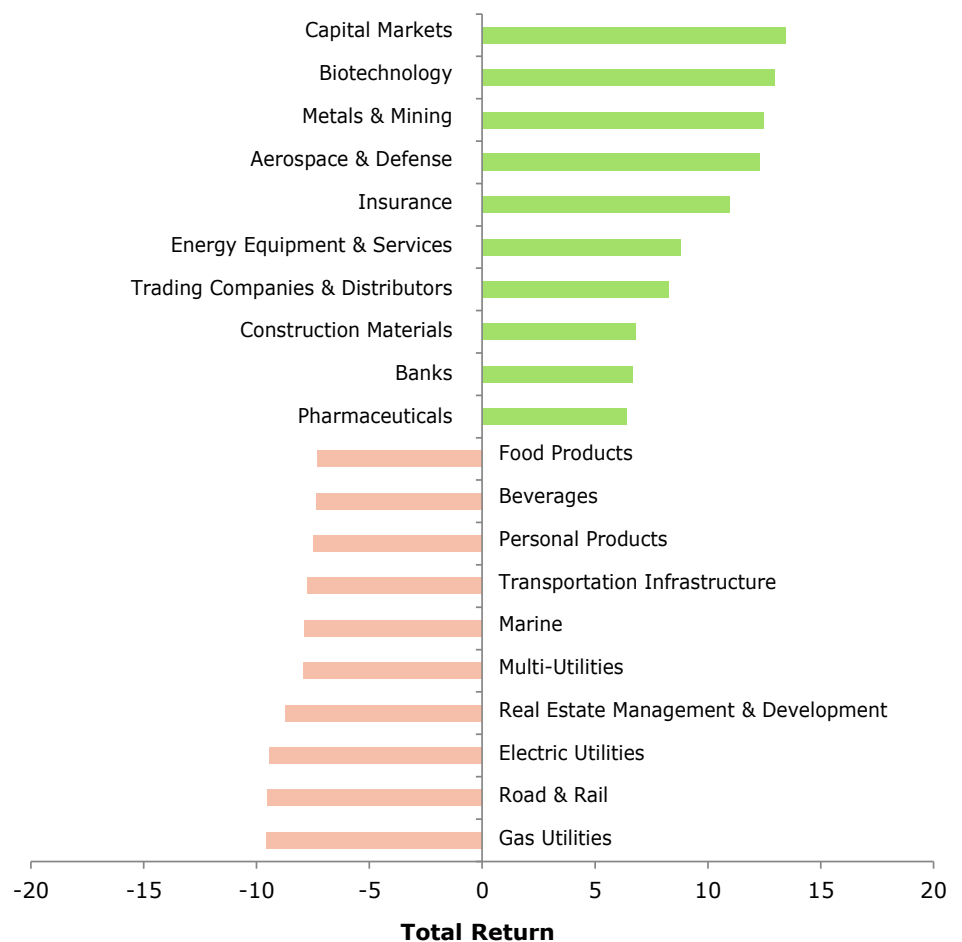
As such, some proponents of coal have called Trump’s infrastructure plans at-odds with reviving the struggling American coal industry, which has been

plagued by the glut of natural gas. Rather than rebuild the coal industry, increased production of gas and oil seems likely to depress domestic coal demand further. New markets in Asia and Europe have also proved difficult to develop, leaving coal with few options for survival short of subsidy. Since burning coal emits twice as much carbon as gas per power unit generated, suppressing its use in favor of gas remains an effective way to decrease carbon emissions over the mid-term.

3. Market Reaction

The market reaction post-election has been relatively positive so far, with positive evolutions in some sectors not entirely offset by negative impacts in others. Most notably, expectations for rising interest rates and eased regulation have led to gains for the financial industry (Banks, Consumer Finance, Capital Markets). Then, the possibility of higher growth and higher inflation has caused bond prices to fall and yields to rise. The defensive stocks seen as alternatives to bonds by some investors (Beverages, Utilities, Food Products, Personal Products, and Tobacco), have thus been negatively affected.

**S&P 500 Top/Bottom 10 Total Return by Sector
(November 8, 2016 – November 14, 2016)**

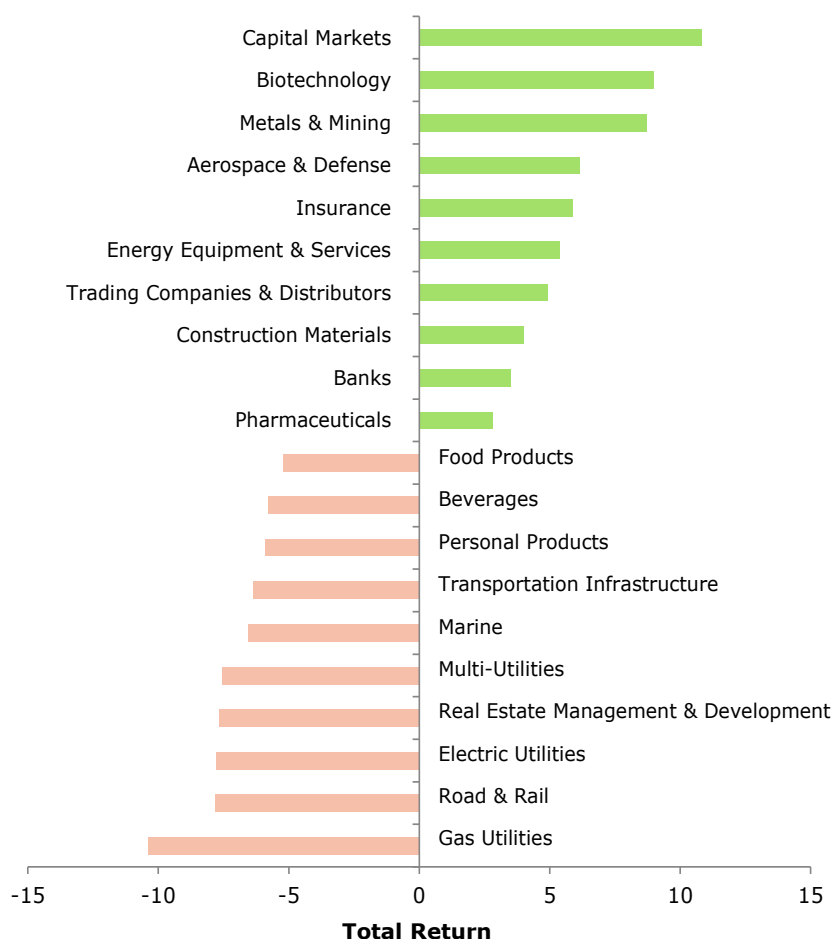


Source: Mirova / Factset

More directly, Trump's infrastructure promises seem to have led to large gains for related sectors (Construction & Industry, Construction Materials, Road & Rail), while concern over the future of wind and solar energy in the United States has contributed to the decline in renewable energy

(Independent Power and Renewable Electricity Producers). Similarly, gas utilities in Europe have suffered, both due to increasing interest rates and the expectation of more competition ahead. Technology (Internet Software & Services, Internet & Direct Marketing Retail) is also down in part due to Trump's disparaging remarks about several large players in the sector, plus concerns over their inability to attract talent post-Trump's immigration reform.

STOXX 600 Top/Bottom 10 Total Return by Sector (November 8, 2016 – November 14, 2016)



Source: Mirova / Factset

Conclusion

While it is true that the election of Donald Trump have led to a more uncertain future for energy and the climate, forces outside of his influence may continue to drive development of clean(er) energy in the United States.

Admittedly, whether the U.S. will participate in the Paris Agreement or finally regulate its domestic carbon emissions remains unknown. But even without these high-level regulatory drivers, the decreasing cost of renewables, particularly when coupled with the Investment and Production Tax Credits, are one reason to remain optimistic. Widespread state-level regulation mandating the implementation of renewables is another. Whether or not King Coal will be able to rise again remains to be seen, especially given the incompatibility between Trump's pro-fracking and pro-coal promises.

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