

Shifting away from coal is key to cutting greenhouse gas emissions, study finds

March 7 2019, by John Kirkland



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The United States could fulfill its greenhouse gas emission pledge under the Paris Climate Agreement by virtually eliminating coal as an energy source by 2024, according to new research from Portland State

University.

Although the Trump Administration announced in 2017 that United States would withdraw from the Paris Agreement, the U.S. cannot officially pull out until 2020.

The research—co-authored by PSU Ph.D. graduate student John Anasis and faculty from PSU's departments of physics, economics and systems science—will be published in the March issue of the journal *Applied Energy*. It examines the [energy](#) shifts that would need to take place for both the U.S. and China to reach the Paris Agreement's goals. Together, the two countries produce roughly 40 percent of global emissions.

The researchers said eliminating coal as an energy source was the most significant step for the U.S. to meet its emissions target. As a result, the U.S. would need shift to an energy portfolio based on [natural gas](#), efficiency, wind, [solar power](#) and biofuels, with oil used predominately for transportation fuel.

In the best of all worlds, [nuclear power](#) also would be part of the mix. The authors state that 12 new nuclear power plants would have to be built by 2025 to cost efficiently make up for the loss of coal, but that the goals could be reached without them at only a slightly higher cost.

"Given the concerns and controversy surrounding nuclear power, this is significant," said PSU Economics Professor Randall Bluffstone, one of the co-authors.

Anasis, the paper's lead author, said the research also showed that a strong push towards energy efficiency and the adoption of electric vehicles would be among the most cost-effective strategies for meeting the emissions targets under the Paris accord.

The authors say many of the energy resource shifts described in the paper are well underway.

"The declining costs of both natural gas and renewables is already displacing significant amounts of coal-fired generation," Bluffstone said.

The Paris accord, dealing with mitigating greenhouse gas emissions, is an agreement adopted in 2015 as part of the United Nations Framework Convention on Climate Change. To date, 195 countries have signed on to the agreement.

More information: John G. Anasis et al. Optimal energy resource mix for the US and China to meet emissions pledges, *Applied Energy* (2019). [DOI: 10.1016/j.apenergy.2019.01.072](https://doi.org/10.1016/j.apenergy.2019.01.072)

Provided by Portland State University

Citation: Shifting away from coal is key to cutting greenhouse gas emissions, study finds (2019, March 7) retrieved 26 April 2024 from <https://phys.org/news/2019-03-shifting-coal-key-greenhouse-gas.html>

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