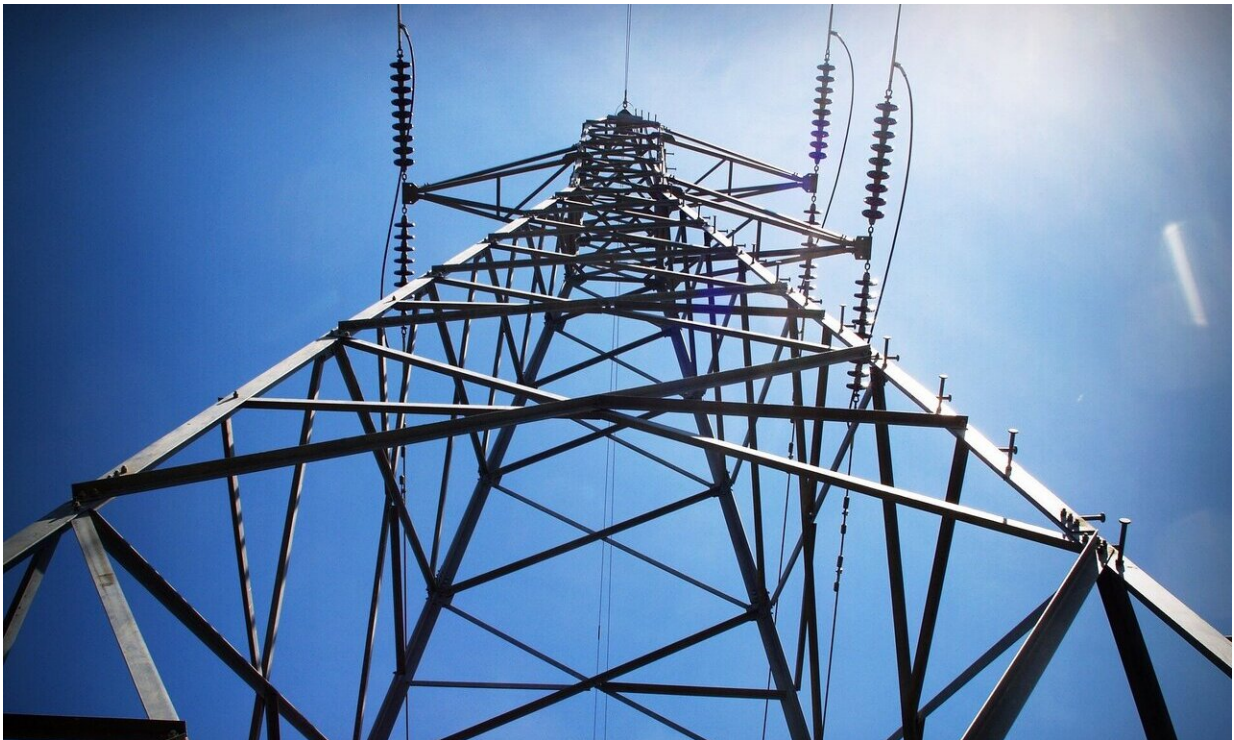


# On the road to Paris: The shifting landscape of CO<sub>2</sub> reduction

November 4 2019, by Ellis Robinson

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Carnegie Mellon University researchers have found that current forecasts call for the U.S. electric power sector to meet the 2020 and 2025 CO<sub>2</sub> reduction requirements in the Paris Agreement—even though the U.S. has announced its withdrawal—and also meet the 2030 CO<sub>2</sub> reduction requirements contemplated by the Clean Power Plan—even

though it has been repealed.

Despite the absence of a national policy aimed at reducing CO<sub>2</sub> emissions, the U.S. is ahead of schedule to meet the short-term and mid-term goals of both the Paris Agreement and the Clean Power Plan, according to a recent viewpoint article published in *Environmental Science & Technology*.

"A year ago, it looked like our ability to meet these larger carbon reduction targets would have required more proactive steps, such as new regulation or new incentive programs," said Jeffrey Anderson, lead author of the paper and Ph.D. candidate of Engineering & Public Policy (EPP). "However, as renewable energy costs have fallen and are projected to continue decreasing even further, we are now well on the path to achieving even the 2030 goals in the Clean Power Plan."

Based on an analysis of projections from the U.S. Energy Information Administration, these carbon reductions will be met without any additional legislative or regulatory activity, said David Rode, faculty of CMU's Electricity Industry Center. The team also included EPP professors Haibo Zhai and Paul Fischbeck, also a professor of Social & Decision Sciences.

In recent years, falling [natural gas prices](#) prompted older coal-fired plants to retire. "Most of the older, dirtier coal-fired plants that could be shut down have been replaced—cost-effectively—with cleaner natural gas," said Zhai. But with natural gas prices now at multi-decade lows, there is a diminished marginal impact on CO<sub>2</sub> emissions from further reductions in natural gas prices.

"We don't expect CO<sub>2</sub> emissions to keep falling significantly due to natural gas prices," said Rode. "This would have been a cause for concern had a new savior not appeared." In coming years, there is a

significant projected decline in the levelized costs of renewable energy, such as wind and solar [power](#). The paper shows that these falling costs are now driving the projected CO<sub>2</sub> reductions past the 2030 goal of the Paris Agreement.

The team emphasized the importance of looking beyond the arguments over the Obama administration's Clean Power Plan, the Trump administration's Affordable Clean Energy rule, and the U.N.'s Paris Agreement. "Because we're on track to meet these targets, the policy discussion should shift to longer-term and more ambitious reduction targets," said Anderson. "What has happened to date has been the easy part," added Rode.

Getting from here to an 80% or 100% reduction in CO<sub>2</sub> emissions will prove far more challenging to the extent it involves substantial demand reductions, and technologies that either have not been used on a large scale or have costs currently far above carbon-emitting technologies.

"Looking forward, greater investment in new technologies will be required," said Zhai. "This may include nuclear power and [carbon capture](#) and sequestration, as well as upgrades in grid transmission and storage" aimed at making the most of renewable resources even when the wind isn't blowing and the sun isn't shining.

Ensuring the availability of several possible approaches to CO<sub>2</sub> reduction, such as renewable power, nuclear, coal with carbon capture and sequestration, and battery storage were all important, given that fuel costs change from year to year and new technologies are hard to predict. Therefore, the authors argue, regulations and incentives shouldn't be focused on any single technology, but on any means of cost-effectively reducing CO<sub>2</sub> emissions.

The article emphasizes that any changes in the current landscape that

could reverse the falling costs of renewables or natural gas, such as the withdrawal of tax incentives for renewables or policies designed to limit [natural gas](#) production, should be avoided to secure the CO<sub>2</sub> reductions currently projected. "We must act now to secure these current gains, said Fischbeck, "but then it is essential that our policy focus shift to the future."

"What our experience to date proves is that maintaining the flexibility to pursue as many options as possible is critical given the uncertainties that we face," he added. "When forecasts about the future change again, we don't want to find ourselves committed to an outdated approach."

**More information:** Jeffrey Anderson et al. On the Road to Paris: The Shifting Landscape of CO<sub>2</sub> Reduction, *Environmental Science & Technology* (2019). [DOI: 10.1021/acs.est.9b05909](https://doi.org/10.1021/acs.est.9b05909)

Provided by Carnegie Mellon University Materials Science and Engineering

Citation: On the road to Paris: The shifting landscape of CO<sub>2</sub> reduction (2019, November 4) retrieved 6 May 2024 from <https://phys.org/news/2019-11-road-paris-shifting-landscape-co2.html>

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