

New York State can achieve 2050 carbon goals: Here's how

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By delving into scientific, technological, environmental and economic data, Cornell University engineering researchers examined whether New York could achieve a statewide carbon-free economy by 2050. Their

finding: Yes, New York can reach this goal—and do it with five years to spare.

Fengqi You, professor in [energy systems engineering](#) and Ning Zhao, a doctoral student in the Process-Energy-Environmental Systems Engineering (PEESE) lab, examined a variety of carbon-neutral energy systems and decarbonization methods after the state passed the Climate Leadership and Community Protection Act (CLCPA) in July 2019. Their new paper, "Can Renewable Generation, Energy Storage and Energy Efficient Technologies Enable Carbon Neutral Energy Transition?" was recently published in *Applied Energy*.

"Now we have a 2050 'net zero' target," You said. "As New Yorkers, we can commit to making the needed changes on renewable energy transition for electricity and space heating. The law's goals are very feasible from economic and technological perspectives."

Among their research highlights:

- By 2050, offshore wind energy will likely be the main source of electricity for the state;
- Natural gas will play a role at the early stage of carbon neutral energy transition for both power and space heating sectors, but will approach obsolescence between 2040 and 2050;
- Geothermal heating (extracting heat from the Earth) and/or electric air heat pumps will become the top methods to heat homes and buildings, replacing [natural gas](#);
- Solar energy will play an important but limited role, the researchers said, due to a lack of winter-time sunlight and other more economically competitive sustainable energy options;
- Geothermal technology will play a key role in decarbonizing New York state, but when paired with a carbon tax, the state's economy will become sustainably green more quickly—possibly

by 2045, according to the scientists.

To motivate public utility companies and New Yorkers to make the needed changes, You and Zhao suggest partnering a carbon tax with the green ideas, so that New York will enjoy a faster trajectory to force out fossil energy.

More information: Ning Zhao et al, Can renewable generation, energy storage and energy efficient technologies enable carbon neutral energy transition?, *Applied Energy* (2020). [DOI: 10.1016/j.apenergy.2020.115889](https://doi.org/10.1016/j.apenergy.2020.115889)

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