

# Study shows a 50% reduction in emissions by 2030 can be achieved

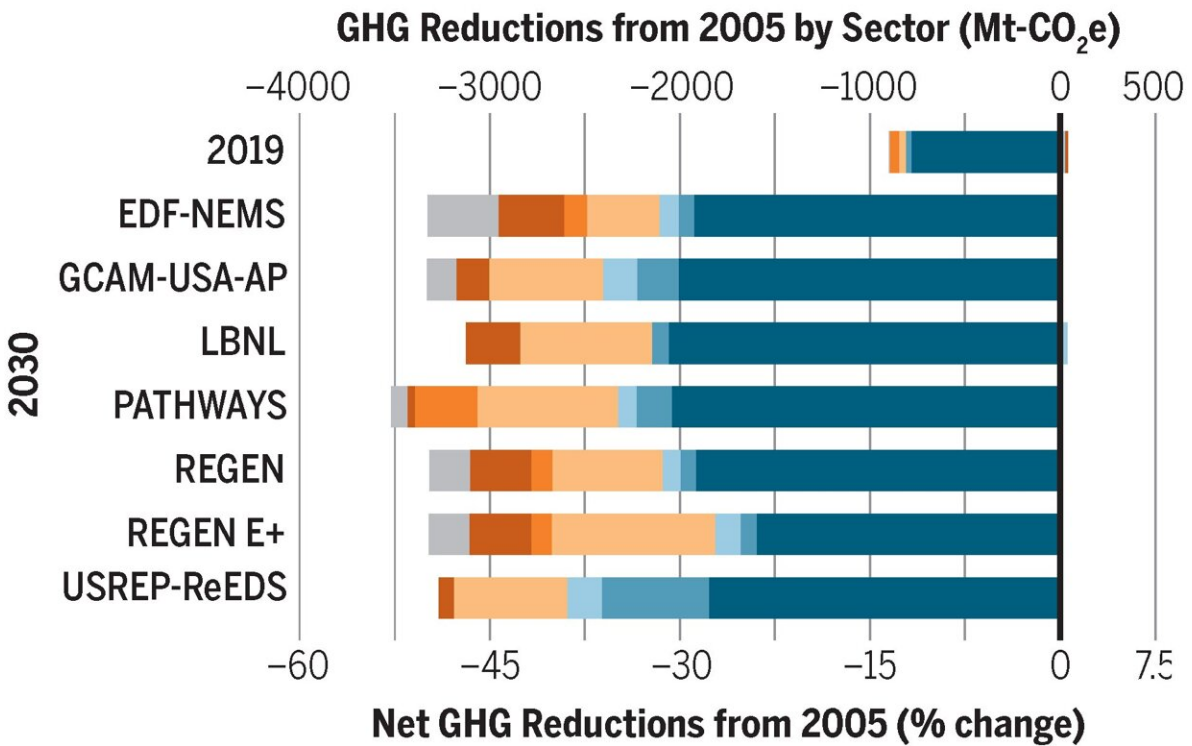
June 2 2022

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## Emissions reductions by sector and model

Historical emissions and 100-year Global Warming Potential values are based on the U.S. EPA’s “Inventory of U.S. Greenhouse Gas Emissions and Sinks.” “Other CO<sub>2</sub>” refers to non-energy CO<sub>2</sub> emissions where specified.

- Land ● Non-CO<sub>2</sub> GHGs ● Other CO<sub>2</sub> ● Transport
- Buildings ● Industry ● Electric



EDF-NEMS, Environmental Defense Fund-National Energy Modeling System (6); GCAM-USA-AP, Global Change Analysis Model for the U.S. (8); LBNL, Lawrence Berkeley National Laboratory models (4); PATHWAYS, Regional Investment and Operations Model supply-side model and EnergyPATHWAYS demand-side model (7); REGEN, U.S. Regional Economy, Greenhouse Gas, and Energy model (5); REGEN E+, US-REGEN model with accelerated electrification (5); USREP-ReEDS, U.S. Regional Energy Policy-Regional Energy Deployment System model (9).

The chart shows how the key economic sectors will contribute to achieve the U.S. goal of reducing greenhouse gas emissions by 50% by 2030. Electric sector (doubling the rate of renewable energy buildout) and Transport sector (selling

predominantly EVs by 2030) would be the most critical strategies for achieving this goal. Credit: Nikit Abhyankar/Berkeley Lab

The United States has set an ambitious goal to reduce greenhouse gas (GHG) emissions by at least 50% by 2030. Are we on track to succeed?

A new study by a team of scientists and policy analysts from across the nation suggests that there are multiple pathways to achieve this goal—but big commitments will need to be made, immediately.

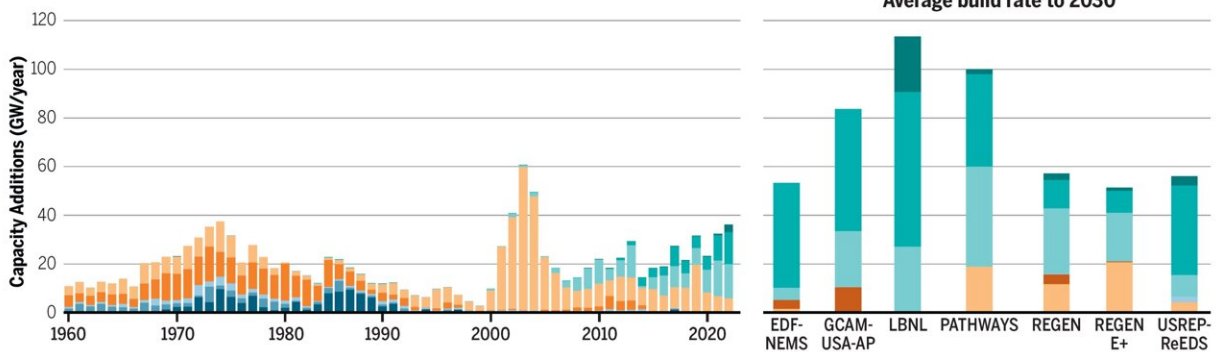
"This study should give [policy makers](#) and other [energy](#) stakeholders some level of comfort, by showing that everybody in the field is pointing in the same direction. The case for clean energy is stronger than ever before and our study shows that the 2030 emission target can be achieved," said Nikit Abhyankar, one of the study's authors and a scientist in the Electricity Markets & Policy Department at Lawrence Berkeley National Laboratory (Berkeley Lab). He notes that the most urgent actions will be to double the amount of renewable capacity built each year and transition predominately to [electric vehicles](#) within the next decade or so.

"With the right policies and infrastructure, we can reduce our emissions, while saving American consumers billions of dollars and generating new employment," he said.

Reducing GHG emissions by 50% by 2030 would put the United States on a path to limit global warming to 1.5 degrees Celsius, the target scientists say is required to avoid the worst consequences of the climate crisis.

### Electric sector transitions by technology

Historical and projected electric sector capacity additions are shown. Projections show the average annual build rates for utility-scale capacity through 2030. Historical values come from Form EIA-860 data. Additional information on participating models and study assumptions can be found in Materials and Methods S1 and S2.



U.S. electricity grid needs to be 80% clean (up from 40% currently) for reaching the U.S. goal of reducing emissions by 50% by 2030. The chart shows the required new electricity generation capacity buildout to achieve this goal (right) and compares with the historical buildout rates (left). The U.S. will need to double its renewable energy buildout rates. Credit: Nikit Abhyankar/Berkeley Lab

The study, published in *Science*, consolidates findings from six recently published techno-economic models that simulate the U.S. energy system operations in comprehensive detail. According to the authors, the separate models all agree on four major points:

- The majority of the country's [greenhouse gas](#) emissions come from [power generation](#) and transportation, so to reduce overall emissions by 50%, the [electricity grid](#) needs to run on 80% clean energy (up from today's 40%), and the majority of vehicles sold by 2030 need to be electric. Other important sources of GHG emissions reduction include electrification of buildings and industries.
- The primary barrier to increased alternative energy use will not

be cost, it will be enacting new policies. A coordinated policy response between states and the federal government will be necessary to succeed.

- Thanks to advances in wind, solar, and energy storage technologies, powering the electric grid with renewables will not be more expensive; and electric vehicles could save every household up to \$1,000 per year in net benefits.
- A [clean-energy](#) transition would reduce air pollution, prevent up to 200,000 premature deaths, and avoid up to \$800 billion in environmental and health costs through 2050. Many of the health benefits will occur in communities of color and frontline communities that are disproportionately exposed to vehicle, power plant, and industrial pollution.

"Our study provides the first detailed roadmap for how the United States can reach its 50% [greenhouse gas emissions](#)-reduction target by 2030," said lead author John Bistline, program manager in the Energy Systems and Climate Analysis Group at the Electric Power Research Institute.

"This will require tripling the pace of historic carbon reductions, an ambitious but achievable target if stakeholders collaborate across all sectors. By comparing results across six independent models, we provide greater confidence about the policies and technology deployment needed to achieve near-term climate goals, laying the groundwork for an affordable, reliable, and equitable net-zero future."

According to Abhyankar, who led the development of one of the six models, "By 2030, wind, solar, coupled with energy storage can provide the bulk of the 80% clean electricity. The findings also show that generating the remaining 20% of grid power won't require the creation of new fossil fuel generators." He noted that existing gas plants, used infrequently and combined with energy storage, hydropower, and nuclear power are sufficient to meet demand during periods of extraordinarily low renewable energy generation or exceptionally high

electricity demand. "And if the right policies are in place, the coal and gas power plants in the country that currently provide the majority of the nation's electricity would recover their initial investment, thereby avoiding risk of cost under-recovery for investors."

"Since announcing the nation's emissions reduction pledge at the 2021 United Nations climate conference, the United States has taken steps in the right direction," said Abhyankar. "But a lot still needs to happen. What we are hoping is that this study will give some level of a blueprint of how it could be done."

**More information:** John Bistline et al, Actions for reducing US emissions at least 50% by 2030, *Science* (2022). [DOI: 10.1126/science.abn0661](https://doi.org/10.1126/science.abn0661)

Provided by Lawrence Berkeley National Laboratory

Citation: Study shows a 50% reduction in emissions by 2030 can be achieved (2022, June 2) retrieved 11 September 2024 from <https://phys.org/news/2022-06-reduction-emissions.html>

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