



## KEY INSIGHTS

- **The bulk of reductions to reach the 2030 U.S. climate target come from power and transport**, though all sectors contribute.
- **Additional policies are needed to reach the 2030 target**, as current policies only lower CO<sub>2</sub> by 6–28% from 2005 levels by 2030.
- **There is robust agreement on the central roles of low-emitting electricity and electrification** as well as the fast pace of deployment relative to historical levels and scenarios with only current policies.
- **Actions to meet the 2030 target can produce a range of benefits** beyond CO<sub>2</sub> reductions, including reductions in air pollutants.

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This brief is based on the paper  
“**Actions for Reducing U.S.  
Emissions at Least 50% by 2030**”  
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## Actions for Reducing U.S. Emissions at Least 50% by 2030

by J. Bistline, N. Abhyankar, G. Blanford, L. Clarke, R. Fakhry, H. McJeon, C. Roney, T. Wilson, M. Yuan, A. Zhao

### New six-model comparison examines actions to reach the 2030 U.S. climate target to reduce greenhouse gas (GHG) emissions by at least 50%.

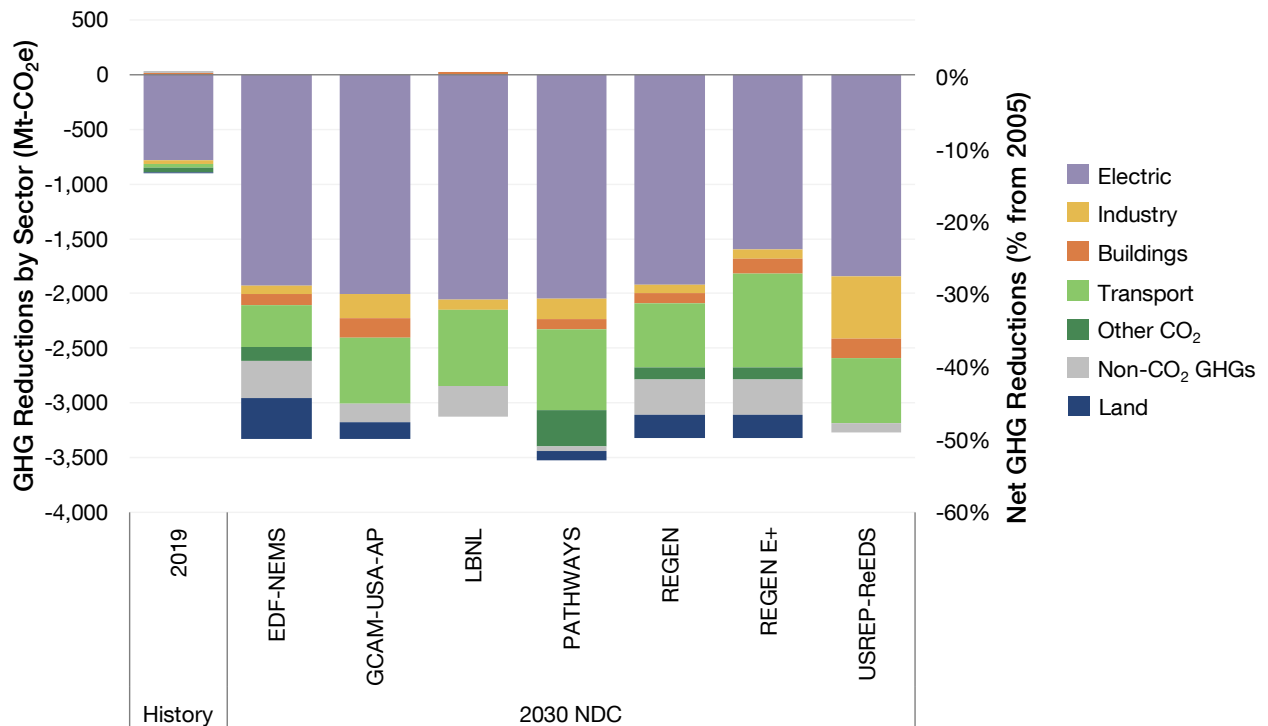
In April 2021, the U.S. updated its Paris Agreement pledge to reduce economy-wide GHG emissions 50–52% by 2030 relative to 2005. But questions remain about the implications of this pledge for energy supply and demand, sectoral emissions pathways, and consumers. This comparison is the first to identify robust findings and potential differences across energy-economic models.

There is robust agreement on “low-regret” strategies—significantly reducing coal generation, deploying renewables, and accelerating electric transport. **The bulk of emissions reductions come from electricity and transport**, which account for 69–89% of 2030 reductions (Figure 1). However, all sectors contribute to reaching the 2030 target.

### The transformations to reach the 2030 target require immediate and sustained efforts:

- Additions of wind and solar capacity increase by 2–7 times their historical levels in the last decade.
- Coal retirements accelerate, leading to ~90–100% reductions in coal generation by 2030.
- Electric vehicle shares as a fraction of new light-duty sales increase from ~4% in 2021 to 34–100% by 2030.





**Figure 1.** Cross-model comparison of U.S. GHG emissions reductions by sector relative to 2005 levels. Detailed descriptions are provided in Bistline, et al. (2022).

There are several key differences across models, including the level of electrification, share of electricity from renewables, ratio of wind to solar builds, extent of new gas capacity (to replace retiring coal capacity and balance renewables), role of emerging technologies (e.g., CCS), and extent of infrastructure buildout (e.g., transmission).

Comparing these scenarios with ones that represent current policies and technological trends indicate implementation gaps that need to be closed through strengthened policies. Results suggest that additional policies are needed to reach the 2030 target. Current policies lead to 6–28% reductions in energy-related CO<sub>2</sub> emissions relative to 2005 levels, falling far short of the

50% emissions target. Marginal abatement costs associated with these targets range from \$36–155/t-CO<sub>2</sub> in 2030 across models depending on policy implementation.

The comparison also shows how actions to meet the 2030 target can produce a range of benefits. In addition to climate benefits of roughly \$140 billion per year, there are significant reductions in non-CO<sub>2</sub> air pollutants such as sulfur dioxide, nitrogen oxides, and particulate matter. Other benefits include increasing jobs, encouraging technological progress and innovation, boosting international competitiveness, and improving distributional outcomes for the lowest-income households.

## FOR MORE INFORMATION

Read the full paper: Bistline, et al. (2022), “Actions for Reducing U.S. Emissions at Least 50% by 2030.” *Science*.

## CONTACT

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