

EU could cut emissions by 40 percent at moderate cost, study says

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The costs of achieving a more ambitious EU climate target are estimated to be moderate. Upscaling greenhouse-gas emissions reduction from the current 20 percent by 2020 to 40 percent by 2030 would be likely to cost less than an additional 0.7 percent of economic activity.

This is a key finding from an international multi-model analysis by the Stanford Energy Modeling Forum (EMF28) and comes at a crucial time, as the European Commission is set to announce next week its plans whether to scale up its efforts on emissions reduction in the next decade. However, beyond 2040, according to the scientists the costs risk to rise substantially. Technological innovation would be needed to counter this.

"In the next two decades, it is possible to achieve the transformation using existing technologies," says Brigitte Knopf of the Potsdam Institute for Climate Impact Research, who led the study conducted by a dozen research groups. Thereafter, however, [energy](#)-economy system models project different costs. Some simulations show a steep increase after 2040, while others show only a linear increase. One determining factor is the degree to which new technologies can replace old ones. This indicates that technological progress is needed to keep costs in check. "A clear price signal has to be set today, for instance in the European Emissions Trading System," says Knopf. "It would provide an incentive for innovation that would prevent energy systems from being locked into long-lasting investments in CO₂-intensive technologies, such as coal-fired power plants."

Current CO2 reductions fall short of achieving long-term climate targets

"The current 20 percent emission reductions by 2020 could fall short of achieving the long-term [climate](#) targets set by the EU," explains Enrica De Cian of the Fondazione Eni Enrico Mattei and the Euro-Mediterranean Center on Climate Change, Italy. "Short-term emissions reductions of at least 40 percent by 2030 are necessary to eventually meet the long-term target of an 80 percent reduction by 2050 aspired by the EU." The reference year is 1990. The models in the study would actually suggest an even more ambitious short-term target than those 40 percent that are currently under debate.

The analysis confirms the core findings of the much debated EU Energy Roadmap, which details the EU climate and energy strategy. "By setting targets for 2030, the EU would signal its willingness to contribute to the global climate mitigation effort", De Cian points out. "And a positive reaction of other countries to this signal could foster technological change and innovation within Europe as well."

Many options to choose from - wind power could expand sevenfold

Options explored by the study to reach the EU climate target range from renewable energies to nuclear energy and energy-efficiency increases.

"There's a wide choice for decision-makers, depending on their preferences, so that's a good thing," says Detlef van Vuuren of the PBL Netherlands Environmental Assessment Agency and Utrecht University. "Still, most model calculations optimizing the change of the electricity system project energy from biomass to expand threefold, and from wind even sevenfold by 2050." This would have to be reflected in a potential future EU target on renewable energy.

One remarkable finding is that Europe could do without relying on the much debated and as yet unproven technology of sequestering CO₂ from power plant emissions and injecting it into the ground. This is a new result compared to the Roadmap study. Nonetheless, 'Carbon Capture and Storage' (CCS) would be needed to achieve an affordable worldwide transformation.

Robust multi-model assessment of EU Roadmap

The new study is the most systematic comparison of computer simulations of the European energy-economy system to date. It includes the PRIMES model, which had attracted criticism in the past for being the only one used by the European Commission for previous assessments of the energy system. "The more comprehensive approach now allows for a more robust assessment of technologies, costs and infrastructure requirements," John Weyant says, who leads the Stanford Energy Modeling Forum EMF. This is detailed in the Special Issue of *Climate Change Economics*. "It shows some very promising opportunities to avoid the risks of unabated [climate change](#)."

More information: Knopf, B., Chen, Y-H. H., De Cian, E., Förster, H., Kanudia, A., Karkatsouli, I., Keppo, I., Koljonen, T., Schuhmacher, K., Van Vuuren, D.P. (2013): Beyond 2020 – Strategies and costs for transforming the European energy system. In a Special Issue of *Climate Change Economics* Vol.04 [[DOI: 10.1142/S2010007813400010](https://doi.org/10.1142/S2010007813400010)]

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