

Long-Term Costs of Cutting Emissions Grow Hazy

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Emissions cuts agreed upon recently by global leaders will have relatively modest economic costs in the near term, but long-run targets will prove harder to meet.

The world's top officials just signed an agreement to slow the buildup of planet-warming greenhouse-gas emissions. They have yet to grapple with the cost of implementing it.

Economists developing sophisticated models have good and bad news. The economic costs of meeting near-term emissions targets are relatively modest. But long-run targets are far harder and infeasible with technology widely available today.

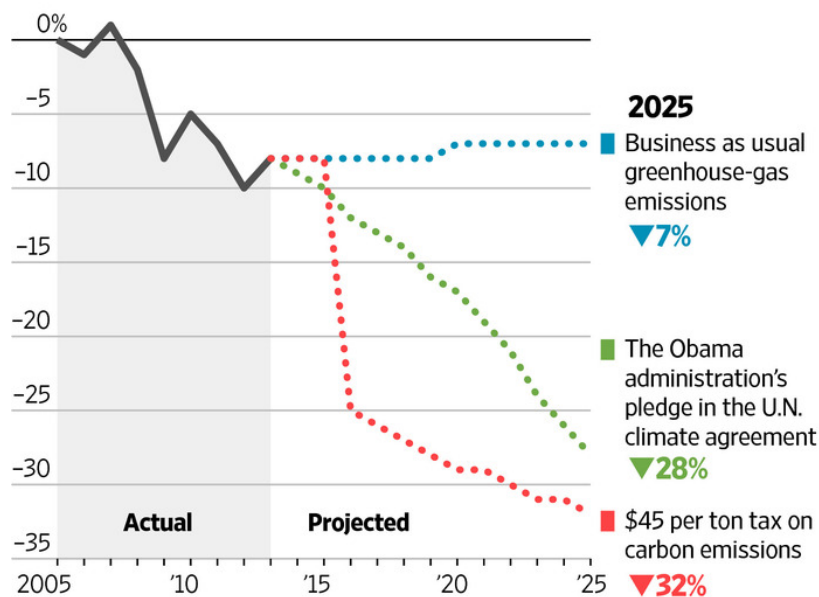
"There's an optical illusion right now, which is that short-term planning leads to low-hanging fruit but not to the kind of strategy that we need to achieve deep decarbonization by 2050," said Columbia University economist Jeffrey Sachs, who advises United Nations Secretary General Ban Ki-moon.

Policy makers meeting in Paris last December agreed Earth's temperature shouldn't rise more than two degrees Celsius above preindustrial levels by the end of the century. The emissions cuts agreed to don't actually limit the temperature rise to two degrees. But the nearly 200 participating nations—most of whom had representatives sign the agreement Friday at the U.N. in New York—hope further cuts in the coming years will.

Carbon Cuts

A tax on carbon emissions would achieve steeper cuts than the Obama administration's pledge, which is primarily made up of a handful of Environmental Protection Agency regulations.

Projected change in greenhouse-gas emissions since 2005 under different scenarios



Sources: EPA greenhouse-gas inventories (actual); economic modeling by Resources for the Future and Stanford University researchers based on U.S. Energy Department data (business as usual and \$45 per ton tax); Obama administration (administration's pledge)

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Most scientists agree that if Earth's temperature rises more than two degrees, the risk of catastrophe rises significantly. Threats include extreme flooding in coastal cities like Miami, Mumbai and Shanghai, and prolonged heat waves in Northern Africa and the Middle East.

To achieve its contribution, the Obama administration committed to cutting U.S. greenhouse-gas emissions between 26% and 28% by 2025 based on 2005 levels. The White House plans to release later this year a strategy to cut carbon emissions through 2050. It has previously said it would aim for cutting emissions 80% by 2050 relative to 2005.

That 80% target, initially crafted by the U.N. about a decade ago, has become an unofficial benchmark for developed countries to limit their emissions.

Economists consider a carbon tax the most efficient approach to limiting carbon emissions. Modeling conducted by Resources for the Future, a nonpartisan think tank, shows such a tax could achieve Mr. Obama's near-term target with only a small impact on the U.S. economy.

A \$45-per-ton tax of carbon dioxide, rising 2% above inflation each year, would make households worse off in 2030 by an amount equal to 0.45% of all household spending if the revenue were used to reduce corporate income taxes, or 0.79% if it were rebated back to households.

Spread over 14 years, such a reduction would be almost unnoticeable. The price of electricity would rise 15% and gasoline prices would go up slightly less than 8%.

Indeed, related work by Resources for the Future and Stanford University researchers finds that a roughly \$45 carbon tax on just electricity could achieve between 75% and 83% of Mr. Obama's 26% to 28% emissions target.

Mr. Obama's signature climate initiative, the Clean Power Plan, could in theory be the vehicle for that since it offers a number of ways, including a carbon tax, for states to meet their mandates. That rule seeks to cut U.S. power-plant carbon emissions 32% by 2030 from 2005 levels.

Getting to Mr. Obama's 80% reduction goal by 2050 is much harder. Economists are divided on whether estimates that far out are meaningful because so many factors, such as advances in technology, are unknowable. "We normally stop at 2030 or 2035 because it really gets so speculative," said Resources for the Future economist Ray Kopp.

But William Nordhaus of Yale University says policy makers need a guide to what to do today to achieve reductions a century from now because that's when the worst consequences of climate change show up.

A simulation using six different models suggests the world could meet those emissions targets if every country applied a carbon tax of \$60 per ton by 2050 and \$425 (in today's dollars) by 2100. The result would be to reduce economic output by 5% to 10%. For gasoline alone, a \$425 per ton carbon tax would translate into a \$3.75 per gallon tax.

According to a report by the Energy Modeling Forum, a consortium at Stanford University, of 17 different models, just nine produced results consistent with capping greenhouse-gas emissions at a level roughly consistent with the two-degree limit, allowing for them to temporarily exceed the long-term target.

Most models indicate that to achieve such deep reductions, technology known as "negative emissions" that can suck greenhouse-gas emissions from the atmosphere would have to be widely adopted around the world. But it's hardly feasible today.

"To believe you can stabilize emissions at concentrations that would be protective of a two-degree target, means you can believe you can suck carbon dioxide out of the atmosphere at a cost the general

population of the world will accept,” said Mr. Kopp, of Resources for the Future. “These are science-fiction sort of problems.”

Some clean-energy and climate experts say most economic modeling fails to predict technological revolutions that could make achieving deep carbon reductions possible.

“The models are biased on the pessimistic side,” said Joe Romm, senior fellow at the left-leaning think tank Center for American Progress, citing the dramatic drop in the price of silicon photovoltaic cells since 1977. “They’re simply not designed to deal with the fact that sometimes change happens quickly.”

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