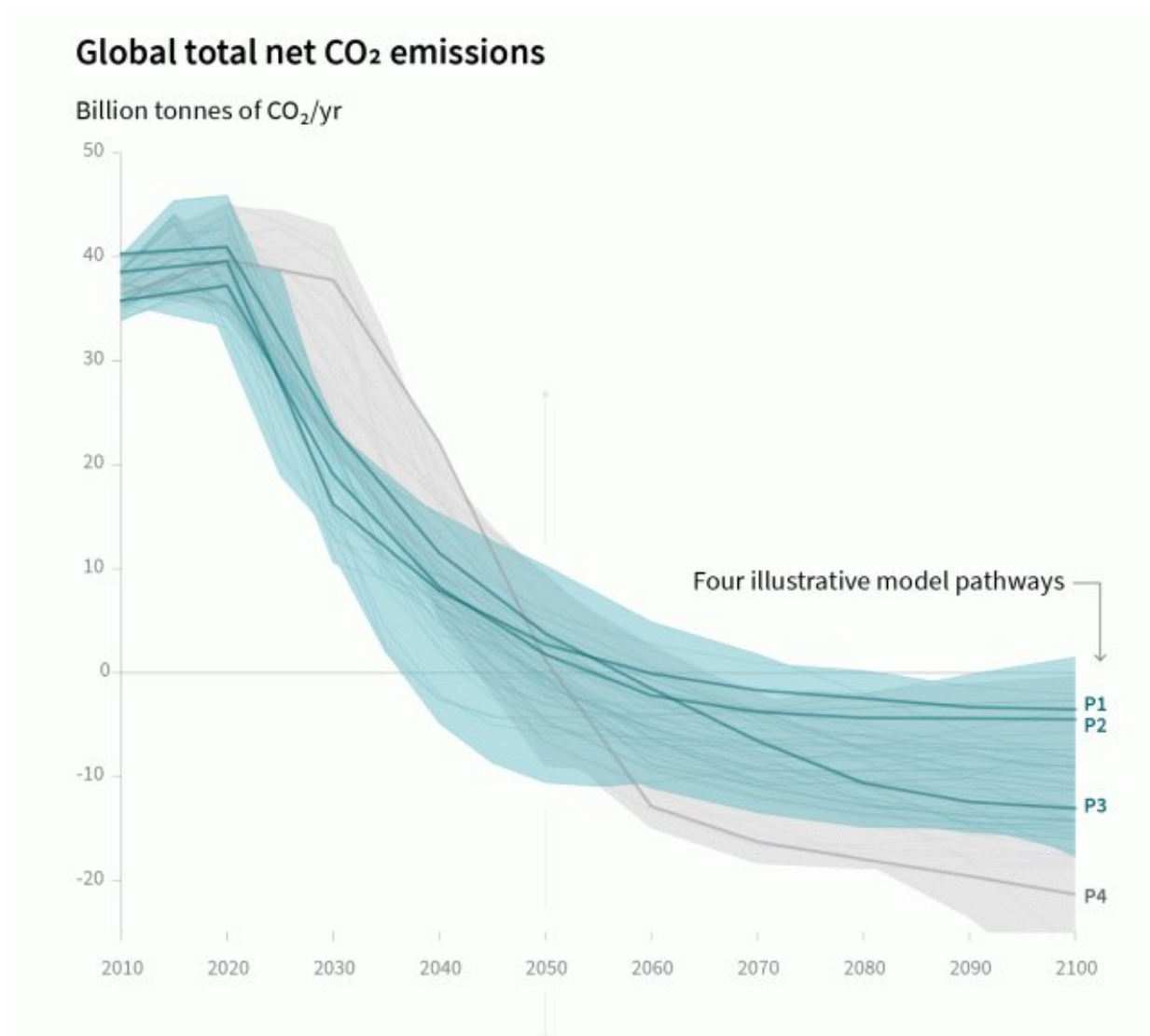


It's totally possible to limit global warming to 1.5 degrees

October 11 2018, by Sarah Fecht



To limit climate change to 1.5°C of warming, the world needs to reach zero net emissions by 2050. This will be challenging, but not impossible. Credit: IPCC

The world is already feeling the impacts of global warming. Since before the Industrial Revolution, the global thermostat has climbed by about 1 degree Celsius. As a result, hurricanes are becoming more fierce; the seas are rising as ice sheets melt; droughts and extreme precipitation events are becoming more common.

A [special report](#) published this week finds that things will get a lot worse if we let the planet reach 2 degrees of warming. The report—authored by 91 scientists from the United Nations' Intergovernmental Panel on Climate Change—outlines the consequences of letting the world heat up past 1.5°C, and lays out pathways on how we can prevent it.

The difference between 1.5°C and of 2°C of warming seems small, but every half-a-degree matters. Limiting climate change to 1.5°C instead of 2°C would have a multitude of benefits. According to the report:

- Global sea level rise would be reduced by about 10 centimeters by 2100. Slowing sea level rise can lessen the impacts of hurricanes, and give people living on islands and coastlines more time to adapt.
- Fewer species would go extinct, and ecosystems would retain more of their services to humans, such as providing food and water.
- Oceans would heat up and acidify less than with 2°C, reducing risks to fisheries and ecosystems.
- Some coral reefs would survive, instead of being nearly or completely wiped out.
- The risks of droughts, food shortages, floods, heat-related deaths are lower under 1.5°C of warming.

But limiting warming to 1.5°C requires human-caused CO₂ emissions to

fall by about 45 percent from 2010 levels by 2030, and reach 'net zero' around 2050. This demands dramatic and rapid changes in how we live.

"We're not talking about generations into the future any more—it's within a couple decades that this needs to happen," said economist Noah Kaufman from the Center for Global Energy Policy, an affiliate of the Earth Institute at Columbia University.

Vijay Modi, a professor of mechanical engineering at Columbia University, agreed. "Whether it's 1.5 degrees or 2 degrees, we need to get going with things pretty fast either way."

The good news is that many of the policies and technologies we need to dramatically curb our emissions already exist.

"I think it starts with a carbon price," says Kaufman. A price on carbon, perhaps in the form of a carbon tax, would make it more expensive to burn fossil fuels and release the emissions into the atmosphere. Not only would this encourage businesses and consumers to change their ways, but it make low-carbon products more competitive, thus increasing investment in those areas. "The shifts you could see in financial markets and investment behaviors could be tremendous," says Kaufman.

The price on carbon wouldn't need to be very steep in order to make a difference, according to [recent calculations](#) from the Center on Global Energy Policy. They found that a tax that starts at \$50 per ton and rises gradually over time could cut emissions by 39 to 46 percent below 2005 levels by 2025. And carbon pricing could have a minimal effect on the economy, particularly if the tax revenues are used in productive ways like to lower other taxes, such as the payroll tax.

Modi sees the glass as "more than half" full, highlighting the potential for solar power and both onshore and offshore wind power in the

Northeast.

"We largely know what to do," he says. "We need to just get going in a highly accelerated fashion, recognizing that some of the costs of clean energy only come down when you start installing things."

After growing the amount of electricity generated by [renewable energy](#), Modi says the next challenge will be getting cars, trucks and planes to run on electricity instead of gas—a transition that's already [well underway](#). Heating needs to make the transition, too, which is something that Modi's lab is working on. In New York City, heating is the biggest source of climate-causing emissions, accounting for more than 50 percent.

The IPCC report notes that limiting warming to 1.5°C will require the ability to pull CO₂ out of the air. Such 'carbon capture' techniques are not as far along as renewable energy and electric cars, and their effectiveness and safety remains largely unproven. However, scientists all over the world are trying to solve these problems, including [within Columbia's](#) Earth Institute.

Kaufman notes that the government could do more to support low carbon infrastructure and innovation of low carbon technologies like carbon removal. Greater investment in research and development could help to "take the good ideas that already exist today and bring them to the commercialization phase," he says.

What's most needed in the effort to stave off two degrees of warming is a change in national policy and mindset. This is indeed a daunting challenge, but the momentum for change is already growing. It comes from voters demanding climate action. It comes from cities and states taking matters into their own hands. It comes from businesses who know a smart investment when they see one, and from individuals who help to

cultivate a [climate-conscious culture](#). Just as tackling [climate change](#) requires a multitude of technologies, it requires action at all levels of society.

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