

How politics, society, and tech shape the path of climate change

February 16 2022



Credit: Unsplash/CC0 Public Domain

Politics and society largely dictate climate policy ambitions and therefore the trajectory of greenhouse gas emissions, yet climate change models and projections rarely include political and social drivers. A

study from the University of California, Davis, simulated 100,000 possible future policy and emissions trajectories to identify relevant variables within the climate-social system that could impact climate change in this century.

The study, published today in the journal *Nature*, indicates that public perceptions of climate change, the future cost and effectiveness of climate mitigation and technologies, and how political institutions respond to public pressure are all important determinants of the degree to which the climate will change over the 21st century.

"Small changes in some variables, like the responsiveness of the political system or the level of public support for [climate policy](#), can sometimes trigger a cascade of feedbacks that result in a tipping point and drastically change the emissions trajectory over the century," said lead author Frances C. Moore, an assistant professor with the UC Davis Department of Environmental Science and Policy. "We're trying to understand what it is about these fundamental socio-political-technical systems that determine emissions."

Coupling climate and policy

The authors note that the biggest uncertainty in understanding climate impacts over the long term is what emissions will be in the future. Most climate and energy modeling treats [policy](#) as something external to the models. But to prepare for [climate impacts](#), adaptation planners need to understand the probability of different temperature outcomes for future decades.

For this study, the authors modeled 100,000 possible future pathways of climate policy and greenhouse gas emissions. They used an integrated, multidisciplinary model that connected data across a wide range of social, political and technical fields. Such scenarios included public and

political support, social perceptions of [climate change](#), how quickly collective action or carbon pricing responds to changes in public opinion and other inputs.

The pathways fell into five clusters, with warming in 2100 varying between 1.8 to 3.6 degrees Celsius above the 1880-1910 average, but with a strong probability of warming between 2 and 3 degrees Celsius at the end of the century.

Key drivers

The results indicate that people's perceptions and social groups, the improvements in mitigation technology over time, and the responsiveness of [political institutions](#) are key drivers of future emissions, even more so than individual actions.

The study is not prescriptive. Rather, it examines what it is about the social-political-technical system that determines [future](#) emissions, integrates that information into existing climate models, and connects them across individual, community, national and global scales.

"Understanding how societies respond to environmental change, and how policy arises from social and political systems, is a key question in sustainability science," Moore said. "I see this as pushing that research, and also being useful for [climate](#) adaptation and impacts planning."

The study's co-authors are Katherine Lacasse of Rhode Island College, Katharine Mach of the University of Miami, Yoon Ah Shin of Arizona State University, Louis Gross of University of Tennessee, and Brian Beckage of University of Vermont.

More information: Frances Moore, Determinants of emissions pathways in the coupled climate–social system, *Nature* (2022). [DOI](#):

[10.1038/s41586-022-04423-8](https://doi.org/10.1038/s41586-022-04423-8).

www.nature.com/articles/s41586-022-04423-8

Provided by UC Davis

Citation: How politics, society, and tech shape the path of climate change (2022, February 16)
retrieved 27 April 2024 from

<https://phys.org/news/2022-02-politics-society-tech-path-climate.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.