Fifth national climate assessment emphasizes mitigation

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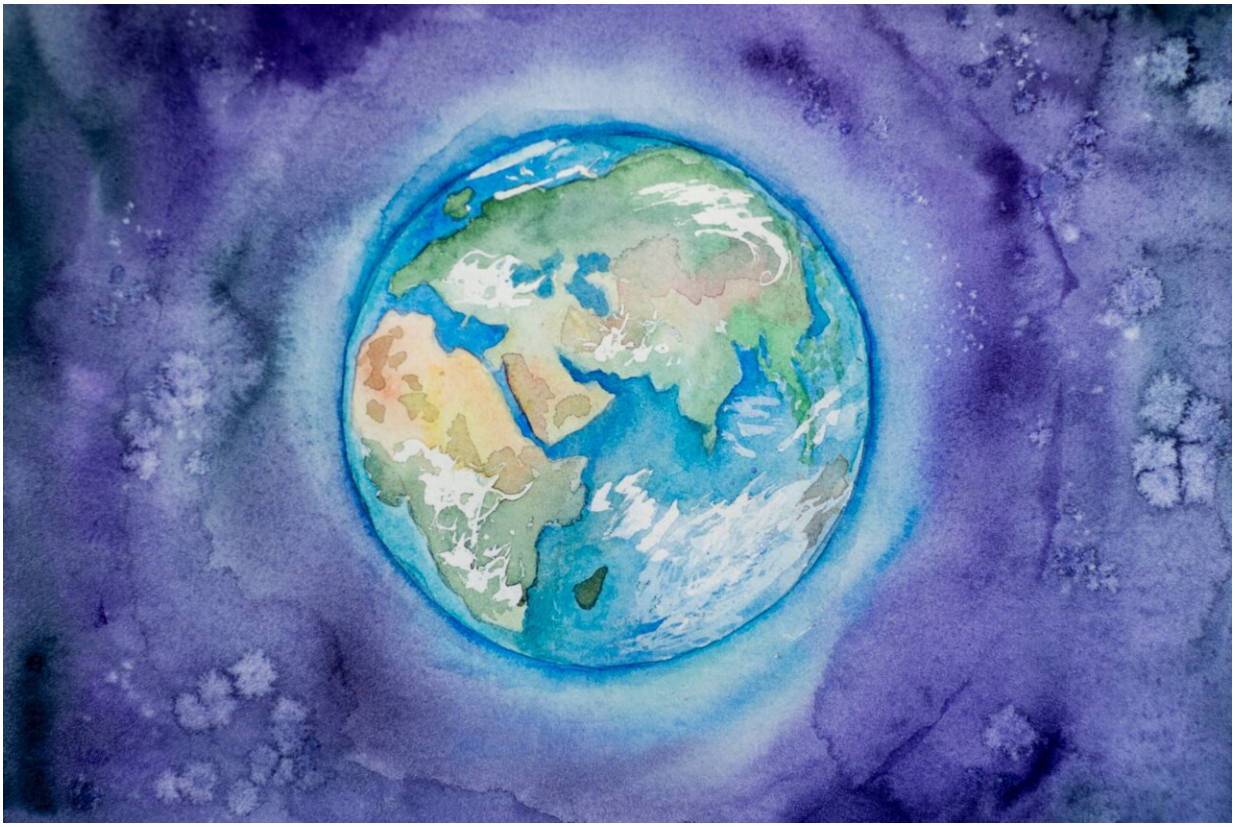

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The latest National Climate Assessment highlights historic emissions reductions and outlines new guidance for achieving a net-zero emissions pathway.

The National Oceanic and Atmospheric Administration recently announced that 2023 is on track to be the hottest year in its recorded history. Furthermore, all 10 of the hottest years on record have occurred since 2010, according to data from the Global Climate Change program at the National Aeronautics and Space Administration (NASA). Informed by accumulating evidence, climate scientists and other experts have been sounding the alarm about the dangers of pollution and humanity's role in exacerbating climate change since at least 1965.

In part in response to these warnings, in 1990 Congress passed the Global Change Research Act, which requires the U.S. Global Change Research Program (USGCRP) to deliver periodic reports to Congress and the President on the current status of climate science, the extent of climate impacts, and trends in global change.

In November 2023, the USGCRP released its Fifth National Climate Assessment (NCA5). Led by the USGCRP's 14 member agencies, more than 750 experts worked over the past four years to develop the NCA5. As John Bistline, a climate scientist at the Electric Power Research Institute, summarized: the NCA5 is the most comprehensive assessment to date "of how climate change is affecting the U.S., how we're responding to it, and additional steps to reduce emissions and advance adaptation."

The report's mitigation chapter spells out those steps to reduce emissions, including summarizing progress to date and identifying "pathways to drastically cut emissions in ways that improve human health, protect jobs, save resources, and redress historical inequities." Led by Steven J. Davis, Professor of Earth System Science at the University of California, Irvine—and including key contributions by co-author Sanya Carley, now the faculty co-director of the Kleinman Center for Energy Policy and the Presidential Distinguished Professor of Energy Policy and City Planning at the University of Pennsylvania—the

mitigation chapter authors combined their expertise in earth science, economics, and climate modeling to outline options for greater emissions mitigation. As part of the chapter, the authors also invite industry contributors to propose usable net-zero emissions pathway models, which will be added to an open database of decarbonization scenarios.

The chapter offers five key messages that, taken together, could help the U.S. meet its international climate commitments and support efforts to reduce global emissions. First, the chapter concludes that successful mitigation requires reaching net-zero emissions. Noting that greenhouse gas (GHG) emissions in the U.S. decreased steadily between 2005 and 2019, the authors nevertheless explain that net GHG emissions would need to decline at a rate that is more than six times faster than the current rate in order to meet current national climate targets and international temperature goals.

Second, the good news: We already know how to drastically reduce emissions. Between demand-side interventions like energy efficiency and the electrification of transportation and heating and supply-side solutions like the use of low-carbon fuels, many emissions-reduction tools are commercially available and economically feasible today.

Third, however, the chapter explains that despite the availability of many mitigation technologies, policymakers need to explore additional options for the U.S. to reach net-zero emissions across the energy, transportation, agricultural, and industrial sectors. These tools include carbon management, long-duration energy storage, and interventions to reduce emissions from farming and manufacturing.

Lastly, the report offers two messages designed to inspire hope for the future: governments, organizations, and individuals can each play key roles in supporting mitigation efforts; and undertaking a just transition to net-zero emissions can help ensure that future energy and food systems

are more sustainable and equitable than their predecessors.

At the Kleinman Center, Professor Carley and co-faculty director Mark Alan Hughes lead several initiatives that dovetail with these goals. Overall, the Center aims to create the conditions for policy innovation that support a just and efficient transition to sustainable energy. Researchers across the university—including professors, professional staff, and students—support this mission through their work to engage critical stakeholders and address pressing challenges related to the energy transition.

Provided by University of Pennsylvania

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