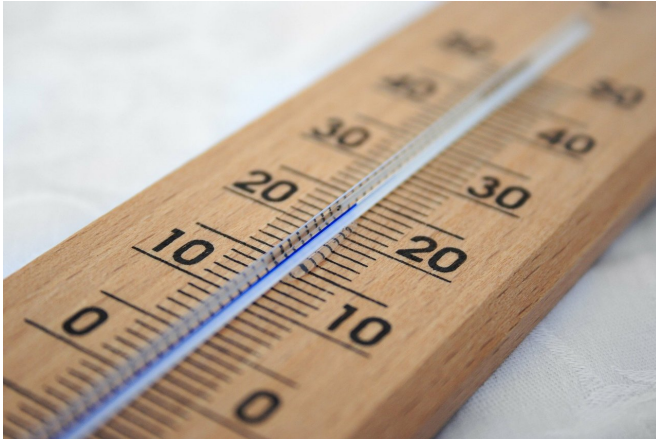


New interactive scenario explorer for 1.5 degrees C pathways

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IIASA and the Integrated Assessment Modeling Consortium (IAMC) have made the scenarios underlying last week's Intergovernmental Panel on Climate Change (IPCC) 1.5°C Special Report publicly available in an interactive online resource. The resource provides scenarios and a suite of visualization and analysis tools, making the assessment more transparent to researchers, policymakers, and the public.

Last week's IPCC special report on the impacts of 1.5°C of global warming drew from a wealth of research including numerous studies by IIASA scientists. The report also relied on a set of scenarios developed by the worldwide [climate](#) research community. IIASA and the IAMC have now published these scenarios, and tools to explore them, in a publicly accessible repository. The 1.5 Degree Scenario Explorer hosted by IIASA was published today and is featured in an accompanying commentary in *Nature Climate Change*.

"This compilation of scenarios is the first systematic and curated community effort to

compile model-based [climate change mitigation](#) pathways in the context of warming of 1.5°C, the Paris Agreement, and sustainable development," says IIASA researcher Daniel Huppmann, who led the development of the resource.

The new scenario explorer—which was developed by IIASA on behalf of the Integrated Assessment Modeling Consortium (IAMC) and the IPCC—includes 414 scenarios for [future climate change](#) developed by more than a dozen research teams from around the world. These scenarios, which focus on limiting temperature rise to below 1.5°C or 2°C above pre-industrial levels, include information related to the energy system, greenhouse gas emissions, land-use change, and other factors connected with climate change and sustainable development.

It also includes visualization tools for exploring the data, so that policymakers and researchers in related fields such as climate finance can explore different options for climate action and their potential consequences. And it is freely accessible to the general public, so that anyone who is interested can explore the scenarios to better understand mitigation options and their synergies and trade-offs with sustainable development and other societal priorities.

"The aim of the new scenario explorer is to help increase the transparency of IPCC assessments, and facilitate better understanding of synergies and trade-offs of climate change mitigation options with [sustainable development](#)," says Huppmann. "This is a major step towards improving transparency and reproducibility of information presented in IPCC reports, in particular with the ability to create tables and figures from the underlying scenario data being made available for the Special Report on 1.5 degrees," adds IIASA researcher Volker Krey, who coordinated the collection of scenarios in the Fifth Assessment Report of the IPCC.

IIASA has hosted scenario databases for many years on behalf of the international research community, starting with the Representative Concentration Pathways (RCPs, released in 2008), and including the Shared Socioeconomic Pathways (SSPs, 2017) and the scenario database for the Fifth Assessment Report of the IPCC (AR5, 2014).

Inside the black box

Scenarios are tools used by researchers to project how the future might look, and what actions—particularly in the policy realm—can be taken to influence future developments in areas such as climate change.

"There are an infinite number of possible pathways that the future could take," explains IIASA Energy Program Director Keywan Riahi, who was also a lead author of the IPCC 1.5C Special Report. "The new explorer provides systematic access to a limited set of representative pathways, which researchers can now draw upon in order to make consistent assumptions about the future and climate change mitigation, adaptation, and impacts."

The current set of scenarios were collected through an open call to the global modeling community. IIASA researchers, in collaboration with Elmar Kriegler at the Potsdam Institute for Climate Impacts Research and other authors of the IPCC report, ran all the submitted scenarios through a number of validation steps for consistency, completeness and near-term plausibility, and assessed their respective warming impact until the end of the century using two reduced-complexity carbon cycle and climate models.

Using the scenario explorer

The scenario explorer sets a new standard for transparency and openness in assessment of quantitative scenarios by the IPCC. But the researchers caution that people using the resource should be aware of the limitations of such scenario ensembles, and they set these out explicitly in the Nature Climate Change article.

In particular, they point out that a number of

scenarios show that limiting global warming to 1.5°C can be achieved without negative emissions technologies such as bioenergy with carbon capture and storage (BECCS). "This information by itself does not imply that reaching ambitious climate goals is less likely without BECCS—instead, it shows that pathways with and without BECCS exist for implementing the Paris Agreement, highlighting that different societal preferences and strategies can result in vastly different outcomes," they write.

The researchers also caution against focusing on the medians, but considering the whole range of possibilities, against cherry picking individual scenarios, and against overinterpreting scenarios that were developed with one specific research purpose.

Finally they point out that the published scenarios cannot represent all possible solutions for limiting climate change to below 1.5°C or 2°C, nor all possible outcomes.

"In solving the challenge of [climate change](#), we need creativity and innovation. While these scenarios represent a large component of what has been published in the literature, the absence of a particular scenario does not necessarily mean that that scenario is not feasible or possible," says IIASA researcher Joeri Rogelj, who was a coordinating lead author of the IPCC special report.

More information: Daniel Huppmann et al, A new scenario resource for integrated 1.5 °C research, *Nature Climate Change* (2018). [DOI: 10.1038/s41558-018-0317-4](https://doi.org/10.1038/s41558-018-0317-4)

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