

Designing an outline for a new climate mitigation modeling framework

Hybrid workshop (on invitation only)

November 23rd 2023
From 9:00 to 16:45 (CET)

Sciences Po - 13 rue de l'Université - 75007. Paris
Building J, Room 208

Final Agenda

Background

The use of models and emission scenarios are pillars of the reports on climate change mitigation by the Intergovernmental Panel on Climate Change (IPCC), while elements of earth system tipping points are reflected in WG1 reports and impacts, vulnerability, and adaptation fall under WG2 methodology (e.g., ISIMIP).

Unfortunately, IPCC mitigation reports rely almost exclusively on global scenarios built in Integrated Assessment Models (IAMs) with the arguments that these scenarios are the only ones to integrate the interrelationship between the economy and the environment in the long-term. Several scholars pointed to flawed foundations of IAMs methodology, especially regarding risks, equity and justice challenges raised by climate change. Scenarios developed using IAMs also fail in answering the question of the speed and the nature of the climate action needed to avoid the announced climate breakdown in IAMs scenarios.

Criticism of IAMs is growing. However, they do not question the underlying normative IAM framework, which is driven by largely exogenous socio-economic growth trajectories and utility maximization, nor do they question IAMs description of structural change, markets, technologies, North/South equity, and distributional issues. Instead, the most progressive critics of IAMs propose considering damage functions and altering the current underlying IAM framework to include a better description of structural and systemic changes needed to avoid the climate breakdown.

The latest [IPCC workshop on scenarios](#) suggests a continuation of the use of IAMs for the next assessment report by considering few improvements such as equity and distribution. The proposed changes are unlikely to make IAMs valuable tools to provide policy guidance regarding climate targets and justice because IAM bias is within the underlying modeling framework.

This workshop aims at debunking what does not work with existing dominant modeling framework and to develop an outline for a new modeling approach that include a wider set of parameters to build momentum and push for alternative methods and models, which allows assessing in an open manner by all users i) the magnitudes of risks in different countries/regions associated with different concentrations of greenhouse gasses and the announced climate neutrality targets as well as ii) how these risks could be distributed across countries and generations considering the known deep uncertainties.

The aim is to i) feed the next IPCC cycle by providing scenarios that reflect better the identified climate risks and their regional and intergenerational impacts and to allow for an open and realistic public debate about climate action, and to ii) identify researchers and institutions in the global South to build collaborations and capacity to empower IPCC focal points.

The workshop is organized around three sessions. The first two sessions include a **5 mins presentation from selected experts, followed by a 50 mins group discussion.**

The last session is a round table discussion based on the conclusions of the previous sessions.

The outputs of the workshop include a policy brief and a peer-reviewed paper.

Sessions outline

09:00 – 09:05 Welcome and opening by Marc Ringel (Sciences Po)

09:05 - 09:15 Setting the scene, Yamina Saheb (Sciences Po)

09:15 - 10:40 Session I: Weaknesses and strengths of the dominant modeling frameworks and scenarios

Moderator: Minal Pathak, Ahmedabad University, India

Presenters (5 mins each)

Salvi Asefi-Najafabady, Environmental Resource Management, US

[The failure of Integrated Assessment Models as a response to 'climate emergency' and ecological breakdown: the Emperor has no clothes](#)

Marc Ringel, Sciences Po (France)

[The economics of immense risk, urgent action and radical change: towards new approaches to the economics of climate change](#)

T.Jayaraman , Swaminathan Research Foundation (MSSRF), India

[Equity Assessment of Global Mitigation Pathways in the IPCC Sixth Assessment Report](#)

E. Espagne, World Bank, US

[Cross-border risks of a global economy in mid-transition](#)

Arnulf Grubler, IIASA, Austria

[A low energy demand scenario for meeting the 1.5 °C target and sustainable development goals without negative emission technologies](#)

Chris Smith , University of Leeds, UK

[The IPCC Sixth Assessment Report WGIII climate assessment of mitigation pathways: from emissions to global temperatures](#)

Sophie Szopa, Paris Saclay University, France

Emissions Scenarios : what is needed for ESM simulations

[A perspective on the next generation of Earth system model scenarios: towards representative emission pathways \(REPs\)](#)

50 mins discussion with all participants to ensure all the strengths and weaknesses of dominant modeling frameworks have been identified

10:40 - 10:50 Coffee break

10:50 – 12:25 - Session II: Alternative modeling frameworks and scenarios: where do we stand?

Moderator: Yamina Saheb, Sciences Po (France)

Presenters (5 mins each)

Kai Kuhnhenn, Konzeptwerk Neue Ökonomie, Germany

[A societal transformation scenario for staying below 1.5°C](#)

Joël Millward-Hopkins, University of Lausanne, Switzerland

[Providing decent living with minimum energy: A global scenario](#)

Andrew Fanning, Doughnut Economics Action Lab

[Provisioning systems for a good life within planetary boundaries](#)

Nathalie Spittler, Club of Rome, University of Natural Resources and Life Sciences and Millennium Institute, Vienna

[Earth for all](#)

Bjoern Soergel, PIK, Germany

[A sustainable development pathway for climate action within the UN 2030 Agenda](#)

Jonathan, Moyer, University of Denver, US

[Modeling transformational policy pathways on low growth and negative growth scenarios to assess impacts on socioeconomic development and carbon emissions](#)

Jarmo Kikstra, IIASA, Austria

[Towards degrowth in IAMs](#)

Mengyu Li, University of Sydney

[Integrated assessment modelling of degrowth scenarios for Australia](#)

Tejal Kanitkar, National Institute of Advanced Studies, Bengaluru, India

[A New Scenario Framework for Equitable and Climate-Compatible Future](#)

50 mins discussion with all participants on how to articulate together all the novelties considered in the identified alternative modeling frameworks and to identify what is still missing.

12:25 - 14: 45 Lunch break (For those attending in person, Sciences Po will not pay for lunch)

14:45 – 16:45 Session III: Requirements and outline for a new modeling framework

Moderator: Marc Ringel (Sciences Po, France)

14:45 - 14:55: Conclusions from session I by Minal Pathak

14:55 - 15:05: Conclusions from session II by Yamina Saheb

15:05 - 16:45 Round table discussion with IPCC WG-Chairs and Vice-Chairs and all participants on how to ensure IPCC AR7 will be more inclusive of all the existing modeling frameworks and scenarios.

Speakers' bios

Marc Ringel



Dr. Marc Ringel is the Chairholder at the European Chair for Sustainable Development and Climate Transition at Sciences Po, Paris. As Chairholder, Dr. Ringel contributes to conducting research and teaching courses at Sciences Po.

He is also a full professor at Nuertingen Geislingen University, Stuttgart, Germany, senior associate researcher with the University of Brussels, Belgium (Vrije Universiteit Brussel) and affiliated lecturer with Université d'Aix en Provence/Marseille, France. He leads multidisciplinary research on green transitions in the energy and climate field, focussing on the role of public governance.

Yamina Saheb



Yamina SAHEB is a lecturer and researcher at Sciences Po (Paris), a lead author of the IPCC report on climate change mitigation and a Senior fellow at OpenExp.

Prior to this position, Yamina was a Senior Fellow Researcher at the University of Münster and previously a Senior Researcher at the University of Lausanne. In 2018, Yamina was the head of energy efficiency unit at the Energy Charter Secretariat. Before that, she was a Policy and Scientific Officer at the Renewables and Energy Efficiency Unit at the Institute of Energy and Transport of the Joint Research Centre (JRC) of the European Commission (EC). She also worked as senior buildings energy efficiency policy analyst at the IEA.

Yamina holds a Ph.D in Energy Engineering, Master's degrees on Landscape Architecture and Development Economics and an Engineering degree in Building technologies.

Minal Pathak



Minal Pathak is Associate Professor at the Global Centre for Environment and Energy at Ahmedabad University, India. She was a Senior Scientist with the Technical Support Unit of Working Group III of the Intergovernmental Panel on Climate Change (IPCC) from 2017-23. She has contributed to four IPCC reports in the Sixth Assessment Cycle 2023 including the Synthesis Report and to other global assessments UNEP Emissions Gap Report 2023 and the UNEP Climate

Technology Progress Report 2023. She was a Visiting Researcher at Imperial College London from 2018-23 and has previously held a Visiting Scholar position at MIT. Her research focuses on climate change mitigation actions for urban settlements, transport and buildings and their co-benefits and interlinkages with development.

Salvi Asefi-Najafabady



Salvi is an Associate Director in Anthesis. She has a PhD from the University of Alabama in Huntsville in Atmospheric Sciences and over 15 years of academic and consulting experience in climate change impact assessment. She has a wide range of experiences in climate risk assessment, designing and applying methods to inform conservation and adaptation planning as well as modeling and developing climate tools and datasets. Throughout her latest consultancy career, Salvi has led the creation of comprehensive, TCFD-aligned climate risk assessment tools and frameworks, and she has

conducted TCFD scenario analyses for various major companies.

T.Jayaraman (TBC)

Étienne Espagne



Étienne Espagne is a senior climate economist at the World Bank EFI chief economist office and an associate researcher at CERDI. His research focuses on building theories, models and methodologies to assess the macro-financial aspects of low-carbon policies as well as climate and nature impacts, especially in developing and emerging economies' context. He co-leads two major programs at the World Bank on analytical tool development and capacity development for finance ministries.

Prior to this, as a senior economist at AFD (Agence Française de Développement), the bilateral development bank for the French government, he developed and contributed to a research program on the modelization and evaluation of climate damages, adaptation and mitigation strategies in developing and emerging economies. He holds a PhD in environmental economics

from the École des Hautes Études en Sciences Sociales (EHESS) and is also a graduate from the French École des Mines de Paris and the Paris School of Economics. He has published several papers in academic journals in the field of climate change and energy economics and regularly teaches at Paris 1 University, EHESS, Ecole Polytechnique and ENSTA Paristech. He has previously worked at France Stratégie, CEPIL and CIRED.

Arnulf Grubler



Arnulf Grubler is Distinguished Emeritus Research Scholar at the International Institute for Applied Systems Analysis (IIASA), Laxenburg, Austria and is also Professor for Sustainable Development at the Mining University Leoben, Austria.

Prof. Grubler has been serving as Lead and Contributing Author for the Intergovernmental Panel on Climate Change (IPCC, co-recipient of the 2007 Nobel Peace Prize) continuously for more than 25 years. His research focuses on the long-term history and future of technology and its impacts on the environment, especially from an end-use perspective. His latest books include: Energy

Technology Innovation: Learning from Historical Successes and Failures, Cambridge University Press, and Energizing Sustainable Cities: Assessing Urban Energy, Routledge.

Chris Smith



Chris Smith is a senior research fellow at the University of Leeds. Chris is the lead developer of the simple climate model “fair”, and the co-leader of Horizon Europe funded project WorldTrans that will improve representation of human decision-making and feedbacks between human and Earth systems in a new transparent integrated assessment model. Chris was a chapter scientist and contributing author to the IPCC Sixth Assessment Report Working Group 1 and Special Report on 1.5°C, and was heavily involved in the climate assessment of emissions pathways in the Working Group 3 contribution.

Sophie Szopa



Sophie Szopa is an atmospheric chemist at the Laboratoire des Sciences du Climat et de l'Environnement, Université Paris-Saclay. She uses numerical models to study how chemistry intervenes in the modification of the composition of the atmosphere and how this affects climate and air quality. She coordinated a chapter on short-lived chemical forces for the AR6-WGI. She participated in the synthesis report.

Kai Kuhnenn

Kai Kuhnenn has been working for ten years at the collective Konzeptwerk Neue Ökonomie e.V. (Laboratory for new economic ideas). Previously, he worked for more than eight years at the German Federal Environment Agency on mitigation scenarios, policy evaluation, sufficiency and the coordination of national responses to IPCC reports.

His main research interest lies in the combination of degrowth thoughts and concepts with climate mitigation scenarios and policies.

Joël Millward-Hopkins



Joel is an interdisciplinary researcher focusing on thorny conceptual and modelling issues in the areas of human well-being, global development, inequality, climate change, energy and resource use, and environmental justice; strongly focusing upon means to secure human well-being without overshooting planetary boundaries. By synthesising this wide array of social and environmental sciences, he hopes to further interdisciplinary research area on the (in)equity of energy & resource use in societies and the reimagining of fair and sustainable futures.

Andrew Fanning



Andrew Fanning is Research & Data Analysis Lead at [Doughnut Economics Action Lab \(DEAL\)](#) and a Visiting Research Fellow at the University of Leeds. He is an ecological economist exploring how to move our interconnected societies towards the goal of meeting the needs of all people within the means of the living planet. He is particularly interested in finding ways to make progress towards this goal visible in data, including the development of an interactive website exploring [A good life for all within planetary boundaries](#).

Nathalie Spittler



Nathalie Spittler is part of the Earth4All modelling team. She is a postdoctoral researcher at the Center for Global Change and Sustainability at the University of Natural Resources and Life Sciences, Vienna, where she currently co-leads the Foresight Group. She also works as a sustainability analyst for the Millennium Institute and is an active member of the Austrian chapter of The Club of Rome. Her focus lies on the application and teaching of systems thinking tools to address global challenges. Nathalie

holds a PhD in environment and life sciences from the University of Iceland and a PhD in economics from CERDI at Université Clermont Auvergne in France.

Bjoern Soergel



Bjoern is a researcher at the Potsdam Institute for Climate Impact Research (PIK). He investigates the interactions between climate change, mitigation efforts, global inequality, and sustainable development. His work highlights the mutual synergies between implementing the Paris Agreement and the broader agenda of the UN Sustainable Development Goals, including targets like poverty eradication, zero hunger or biodiversity protection. He was a contributing author for WG3 Ch. 3 of the IPCC 6th Assessment Report, and has recently co-lead the modelling efforts for a model comparison of sustainable development pathway scenarios in the SHAPE project.

Jonathan Moyer



Jonathan D. Moyer is Assistant Professor at the Josef Korbel School of International Studies and Director of the Frederick S. Pardee Center for International Futures. He works across various research areas, extending and using the International Futures (IFs) integrated assessment platform. Jonathan studies patterns of human development through funded research for organizations like the African Union Development Agency and the United Nations. He leads the creation of new data and tools to better understand and analyze international relations contributing to reports such as the U.S. National Intelligence Council Global Trends 2030. Jonathan also researches patterns and drivers of state fragility and failure most notably as Lead Co-PI on a five-year Minerva grant.

Jarmo Kikstra



Jarmo Kikstra is a research scholar at IIASA and PhD candidate at Imperial College London, working with integrated assessment models (IAMs). He has contributed to multiple UNEP Emission Gap Reports and the IPCC Sixth Assessment Report – coordinating and implementing climate simulations for mitigation pathways. His work revolves around understanding globally just transitions. Central is combining climate mitigation scenarios with universal human needs provisioning. Related to this, Jarmo's work has been focused on Decent Living Standards and energy requirements, but he is also interested in the economic impacts of

climate change, post-growth scenarios, and justice and equity in scenarios more broadly.

Mengyu Li



Dr. Mengyu Li is a researcher in ISA. Her current research includes 1) low-carbon power grids, electric vehicles and energy transition pathways; 2) quantitative assessments of climate-, pandemic- and geopolitics-related disasters; and 3) integrated assessment of future resource scenarios of climate change.

Tejal Kanitkar



Tejal is an Associate Professor in the Energy, Environment, and Climate Change Program, at NIAS in Bengaluru, India. She is a mechanical engineer and has worked in the area of energy and climate studies since 2006. She works integrating perspectives from the natural sciences, engineering, and social sciences to understand the interconnected aspects of energy production, environmental constraints, and economic development, with a perspective that prioritizes equity and justice.