



Expanding Integrated Assessment Modelling:
Comprehensive and Comprehensible Science
for Sustainable, Co-Created Climate Action

D6.5 - Scientific & policy outreach (including briefs) – Update

WP6 – Explaining – Policy analysis,
capacity development, CDE

28/07/2025



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EC Summary Requirements

1. Changes with respect to the DoA

No changes with respect to the work described in the DoA.

2. Dissemination and uptake

This deliverable can be used by any party interested in the scientific and policy outreach of the IAM COMPACT project, in terms of scientific publications in high-impact journals, presentations, and posters in academic conferences, as well as of other types of publications and media outputs targeting policymakers and other stakeholders, including policy briefs, videos, newsletters, etc., in order to direct them into exploring the project's scientific and policy outcomes.

3. Short summary of results (<250 words)

To disseminate obtained, processed, and accumulated knowledge for scientific debate and progress, IAM COMPACT has engaged in sharing its scientific insights in numerous high-impact journals and conferences. As the project aims to inform policy choices, we have transposed highly technical modelling results into legible policy recommendations in the form of timely publications of policy briefs, articles, and commentaries in multiple media outlets for stakeholders, policymakers, businesses, and civil society actors, as well as have created a series of infographics and educational videos to promote capacity building and comprehensibility of modelling by all stakeholders at all scales.

By July 2025, IAM COMPACT had produced 51 scientific publications in highly esteemed scientific journals, 1 book chapter, and 50 posters/papers in academic conferences. Regarding its policy outreach, it had also published 6 policy briefs, 13 press releases, and 14 newsletters. In an endeavour to create awareness with stakeholders and provide open access self-learning training materials, the project has also uploaded 22 videos demonstrating each modelling ensemble and our vetting tool, accompanied by 21 slide packs, and 16 infographics. Towards informing a wider audience on climate, environment, energy, biodiversity, and sustainability aspects related to the project, we have also engaged in science communication in various media outlets, with 14 articles/commentaries. Finally, we have participated in 12 policy events and 13 policy/capacity building workshops, aiming to increase the outreach of the project's outputs and enhance cooperation and mutual learning.

Overall, the significance of the project's scientific and policy outreach is in line with its pathways towards outcomes and impact.

4. Evidence of accomplishment

This report, all scientific publications of the project (listed in the following sections), all other material in the links presented in the following sections (in press, the website, etc.) as well as the following links in the project website:

- IAM COMPACT scientific publications ([Website link](#))
- IAM COMPACT conference publications ([Website link](#))
- IAM COMPACT press communications ([Website link](#))

Preface

IAM COMPACT supports the assessment of global climate goals, progress, and feasibility space, and the design of the next round of Nationally Determined Contributions (NDCs) and policy planning beyond 2030 for major emitters and non-high-income countries. It uses a diverse ensemble of models, tools, and insights from social and political sciences and operations research, integrating bodies of knowledge to co-create the research process and enhance transparency, robustness, and policy relevance. It explores the role of structural changes in major emitting sectors and of political, behaviour, and social aspects in mitigation, quantifies factors promoting or hindering climate neutrality, and accounts for extreme scenarios, to deliver a range of global and national pathways that are environmentally effective, viable, feasible, and desirable. In doing so, it fully accounts for COVID-19 impacts and recovery strategies and aligns climate action with broader sustainability goals, while developing technical capacity and promoting ownership in non-high-income countries.

NTUA – National Technical University of Athens	EL	
Aalto – Aalto Korkeakoulusaatio SR	FI	
AAU – Aalborg Universitet	DK	
BC3 – Asociacion BC3 Basque Centre for Climate Change – Klima Aldaketa Ikergai	ES	
Bruegel – Bruegel AISBL	BE	
CARTIF – Fundacion CARTIF	ES	
CICERO – Cicero Senter for Klimaforskning Stiftelse	NO	
E3M – E3-Modelling AE	EL	
KTH – Kungliga Tekniska Hogskolan	SE	
POLIMI – Politecnico di Milano	IT	
UPRC – University of Piraeus Research Center	EL	
UVa – Universidad De Valladolid	ES	
WI – Wuppertal Institut fur Klima, Umwelt, Energie GGMBH	DE	
IIMA – Indian Institute of Management	IN	
THU – Tsinghua University	CN	
USMF – University System of Maryland	US	
AAiT – Addis Ababa University	ET	
KEI – International Civic Organisation Kyiv Economics Institute	UA	
RUSL – Raja Rata University of Sri Lanka	LK	
TUM – Technical University of Mombasa	KE	
UNIGE – Université de Genève	CH	
Imperial – Imperial College of Science, Technology and Medicine	UK	

Executive Summary

IAM COMPACT has engaged in sharing its scientific insights in numerous high-impact journals and conferences to provide information in light of the preparation of climate policies and national planning for the post-2030 period, as part of the Paris Agreement goals and the need to reduce global net greenhouse emissions to zero by 2050, as well as to disseminate obtained, processed and accumulated knowledge for scientific debate and progress, and provide feedback to the IPCC 7th Assessment Report (AR7) Cycle. As the project aims to inform policy choices, enhance mutual learning, and boost international cooperation, we have transposed highly technical modelling results into legible policy recommendations in the form of timely publications of policy briefs, articles, and commentaries in multiple media outlets for stakeholders, policymakers, as well as business and civil society actors, and have created a series of infographics and educational videos to promote capacity building and ensure comprehensibility of modelling information by all stakeholders at all scales.

One month before the end of its life cycle, IAM COMPACT has contributed to the scientific community by publishing 51 research papers in highly esteemed scientific journals, 1 book chapter in a peer-reviewed book and 50 posters, presentations, and/or papers in academic conferences. Regarding its policy outreach, IAM COMPACT has published 6 policy briefs, 13 press releases and 14 newsletters. Additionally, in an endeavour to create awareness with stakeholders and provide open access self-learning training materials, the project has also uploaded 22 videos (demonstrating the project's modelling ensemble and vetting tool), accompanied by 21 slide packs for each model, and 16 infographics. Towards informing a wider audience on climate, environment, energy, biodiversity, and sustainability aspects related to IAM COMPACT, the project's partners have also engaged in policy commentaries in various media outlets, with 14 articles/commentaries so far. Lastly, the project has participated in 12 policy events and 13 policy and capacity development workshops, aiming to enhance learning and cooperation and increase the outreach of the project's outputs.

The scientific and policy outreach of the project is interrelated with all project outcomes and performance indicators (see also D6.2 - IAM COMPACT CDE plan – Update 1¹), actively supporting and scientifically underpinning the transition to a climate-neutral and resilient society and economy.

The first expected outcome (EO₁) of the project is focused on the provision of information for the preparation of climate policies and national planning for the post-2030 period, and requires:

- over 20 scientific publications on national, regional, and global post-2030 pathways, considering extreme events, disruptive changes, societal innovations, gender, and SDGs, 21 of which have already been published (Section 2); and
- over 10 policy briefs for EU and partner countries, 6 of which have been produced by July 2025 (Section 5)—with at least 4 more expected by August 2025.

The second expected outcome (EO₂) calls for international cooperation among the modelling community and other relevant stakeholders to expand the provision of robust in-country advice to decision-makers around the world focused on collaboration, through, among others:

- over 15 scientific publications on national and global mitigation pathways jointly produced with other research projects and non-consortium teams; 31 have been published (Section 2); and
- at least 10 events jointly held in collaborations and synergies with other/sister research projects; 12 have been held (Section 8).

The third expected outcome (EO₃) is about mutual learning among the modelling, social science, and policy communities to ensure coherence between different tools used to inform climate action, and consistency with the

¹ DOI [10.5281/zenodo.10848435](https://doi.org/10.5281/zenodo.10848435).

best available and open science, and asks for:

- at least 10 consortium-wide scientific interdisciplinary/transdisciplinary publications, 13 published (Section 2);
- at least 2 scientific papers on interdisciplinary modelling science frameworks, 8 of which is available (Section 2);
- at least 10 submissions to modelling consortia (IAMC, ECEMP, etc.) meetings, 34 have already been completed (Section 4); and
- at least 25 participations in relevant scientific conferences, 50 have been successfully completed (Section 4).

The project has already surpassed most of its quantitative targets across all three expected outcomes, with publications, events, and participations exceeding the required numbers well ahead of schedule. While further work is needed to complete the remaining policy briefs, overall progress demonstrates strong achievement and alignment with the objectives of providing robust information, fostering international collaboration, and advancing mutual learning.

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1 Introduction

The scientific and policy outreach of IAM COMPACT aims at policymakers at all scales from countries/regions represented in the consortium, scientists in IPCC processes, researchers in relevant H2020 and Horizon Europe projects, and members of research consortia / communities academia specifically but not limited to modelling researchers and social scientists worldwide, industry decision-makers & business associations, especially from high-emitting industries, as well as civil society, including civil society organisations, climate activist groups, and citizens more broadly.

Among key outputs of the project are the expansion of the science base and technical capacity to scientifically underpin climate policy at national and global level, acknowledging that post-2030, Paris-compliant routes to net zero should integrate hitherto underexplored aspects of policy, society, economy, and technology. Apart from and toward effectively informing climate action, a core motivation of the project is to advance and expand the capabilities of integrated assessment models and climate change policy research, and enhance the robustness of policy prescriptions, and improve the understanding of aspects underrepresented, including interactions with other political priorities (poverty alleviation, gender equality, growth, mobility, unemployment, etc.) structural inertia, and path dependencies. In achieving that, IAM COMPACT produces and shares with the scientific community an interdisciplinary & transdisciplinary framework for multi-model analysis of climate action that includes the representation of out-of-ordinary extremes, disruptive innovations, lifestyle and social innovation, and sustainable development pathways, and reinforces qualitative evidence with qualitative analysis exploring in-depth the factors driving and hindering decarbonisation in sectors, from both global and national perspectives.

By July 2025, IAM COMPACT had produced 51 scientific publications in highly esteemed scientific journals (such as Joule or Nature Climate Change), and 50 posters/papers in academic conferences such as the Integrated Assessment Modeling Consortium meetings and the European Climate and Energy Modelling Platform). Moreover, regarding its policy outreach, it has already published 6 policy briefs, 13 press releases, and 14 newsletters. Additionally, in an endeavour to create awareness with stakeholders and provide open access self-learning training materials, the project has also uploaded 22 videos demonstrating each modelling ensemble and our vetting tool, accompanied by 21 slide packs, and 16 infographics. Towards informing a wider audience on climate, environment, energy, biodiversity, and sustainability aspects related to the project, we have also engaged in science communication in various media outlets, with 14 articles/commentaries. Lastly, we have participated in 12 policy events and 13 policy/capacity building workshops, aiming to increase the outreach of the project's outputs and enhance cooperation and mutual learning.

The results presented in this deliverable are part of both co-creative cycles of IAM COMPACT and its Policy Response Mechanism, which drives the project's policy relevance, continuing the reporting from D6.4 – Scientific & policy outreach (including briefs)². In the second cycle of the project, we carried out an assessment of policy-relevant modelling against co-created, realistic baselines and multiple types and sources of uncertainty, taking into account national contexts and the specificities of a diverse range of countries. This included an update of the representation of policy measures and packages in the project's wide modelling ensemble to better capture the dynamics needed to drive the required transitions. Building on this foundation, the analysis was expanded to explore the implications of and for behavioural change, disruptive and societal innovations, extreme developments and crises, as well as broader sustainable development dimensions.

Specifically, Section 2 reports the scientific publications of the consortium, Section 3 the book chapters published, and Section 4 the consortium's participation in relevant scientific conferences. Afterwards, Section 5 presents the project's policy briefs, Sections 6 and 7 outline the newsletters and press releases published and communicated to interested stakeholders. Section 8 includes all the policy events and workshops, in which the consortium has

² DOI [10.5281/zenodo.10722218](https://doi.org/10.5281/zenodo.10722218)

participated. Section 9 outlines the media outreach of the projects, by listing all articles about and/or commentaries by the consortium in international press. Finally, Sections 10 and 11 list the project's videos and infographics, respectively.

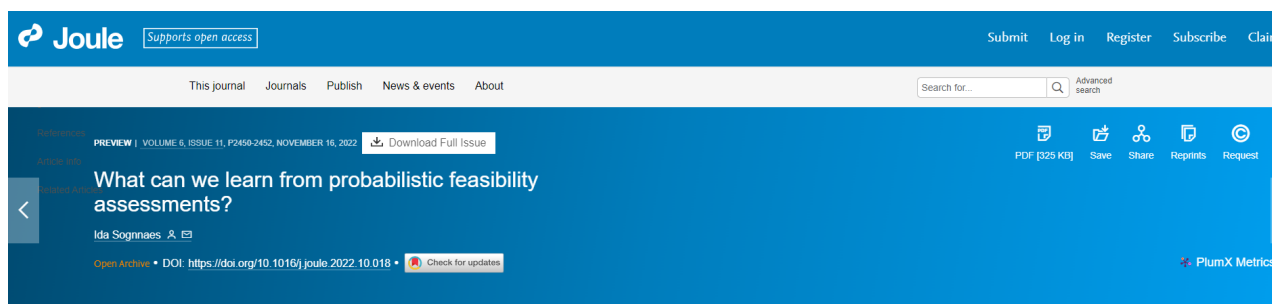
2 List of scientific publications in peer-reviewed journals

In this section, we report all the scientific publications³ supported by the IAM COMPACT project, mentioning the title, authors (adding the IAM COMPACT partner institutes in parentheses), abstract, and any synergies with other projects funded by the EC or otherwise.

2.1 Sognnaes (2022), Joule

Title:	What can we learn from probabilistic feasibility assessments?
Authors:	Ida Sognnaes (CICERO)
Journal:	Joule
Abstract:	In a new paper in Nature Energy, Odenweller et al. use uncertainty analysis to derive a probabilistic feasibility space for green hydrogen supply. Their analysis shows that even if electrolysis capacity grows as fast as wind and solar power have done, green hydrogen supply will remain scarce in the short term and uncertain in the long term.
Keywords:	Hydrogen; feasibility
DOI:	https://doi.org/10.1016/j.joule.2022.10.018
First Online:	16 November 2022
Repository:	Zenodo (Link: https://zenodo.org/records/7360781)
Synergies with:	H2020 PARIS REINFORCE (GA: 820846)
Citation (APA):	Sognnaes, I. (2022). What can we learn from probabilistic feasibility assessments?. Joule, 6(11), 2450-2452.

³ <https://iam-compact.eu/publications/scientific-publications>



In a new paper in *Nature Energy*, Odenweller et al. use uncertainty analysis to derive a probabilistic feasibility space for green hydrogen supply. Their analysis shows that even if electrolysis capacity grows as fast as wind and solar power have done, green hydrogen supply will remain scarce in the short term and uncertain in the long term.

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Main text

Achieving net-zero carbon emissions, which is necessary to limit global warming to well below 2°C, requires rapid scaling up of low-carbon technologies. Hundreds of mitigation scenarios have been produced to show how this can be achieved. Scenarios show a wide range of possibilities, but the Intergovernmental Panel for Climate Change (IPCC) and the Integrated Assessment Modeling (IAM) and energy-economy modeling communities have long been reluctant to assign probabilities to scenarios.¹ The IPCC clearly states that mitigation scenarios are “neither predictions nor forecasts.”²

At the same time, mitigation scenarios are meant to be “plausible,” and judgments of what is and isn’t plausible necessarily require some implicit judgments of likelihood. Several recent studies have questioned the plausibility of key aspects of mitigation scenarios. For instance, studies have cast doubt on the scale of carbon removal technologies³ and on the likelihood of the widely used RCP8.5 scenario.⁴ These and many other studies are part of a growing discussion around the

Figure 1. Preview of ‘What can we learn from probabilistic feasibility assessments?’ in Joule

2.2 Perdana et al. (2022), Energy Strategy Reviews

Title:	Expert perceptions of game-changing innovations towards net zero
Authors:	Sigit Perdana, Georgios Xexakis, Konstantinos Koasidis (NTUA), Marc Vielle, Alexandros Nikas (NTUA), Haris Doukas (NTUA), Ajay Gambhir (Imperial), Annela Anger-Kraavi, Elin May, Ben McWilliams (Bruegel), Baptiste Boitier
Journal:	Energy Strategy Reviews
Abstract:	Current technological improvements are yet to put the world on track to net-zero, which will require the uptake of transformative low-carbon innovations to supplement mitigation efforts. However, the role of such innovations is not yet fully understood; some of these 'miracles' are considered indispensable to Paris Agreement-compliant mitigation, but their limitations, availability, and potential remain a source of debate. We evaluate such potentially game-changing innovations from the experts' perspective, aiming to support the design of realistic decarbonisation scenarios and better-informed net-zero policy strategies. In a worldwide survey, 260 climate and energy experts assessed transformative innovations against their mitigation potential, at-scale availability and/or widescale adoption, and risk of delayed diffusion. Hierarchical clustering and multi-criteria decision-making revealed differences in perceptions of core technological innovations, with next-generation energy storage, alternative building materials, iron-ore electrolysis, and hydrogen in steelmaking emerging as top priorities. Instead, technologies highly represented in well-below-2°C scenarios seemingly feature considerable and impactful delays, hinting at the need to re-evaluate their role in future pathways. Experts' assessments appear to converge more on the potential role of other disruptive innovations, including lifestyle shifts and alternative economic models, indicating the importance of scenarios including non-technological and demand-side innovations. To provide insights for expert elicitation processes, we finally note caveats related to the level of representativeness among the 260 engaged experts, the level of their expertise that may have varied across the examined innovations, and the potential for subjective interpretation to which the employed linguistic scales may be prone to.
Keywords:	Expert survey; Game changers; Low-carbon innovations; Disruptive innovation; Behavioural change
DOI:	https://doi.org/10.1016/j.esr.2022.101022
First Online:	13 December 2022
Repository:	Zenodo (Link: https://zenodo.org/records/7704465)
Synergies with:	H2020 PARIS REINFORCE (GA: 820846), HFRI ATOM (GA: HFRI-FM17–2566)
Citation (APA):	Perdana, S., Xexakis, G., Koasidis, K., Vielle, M., Nikas, A., Doukas, H., ... & Boitier, B. (2023). Expert perceptions of game-changing innovations towards net zero. <i>Energy Strategy Reviews</i> , 45, 101022.



Energy Strategy Reviews
Volume 45, January 2023, 101022



Expert perceptions of game-changing innovations towards net zero

Sigit Perdana^a, Georgios Xexakis^b, Konstantinos Kousidis^c, Marc Vielle^a, Alexandros Nikas^c,
Haris Doukas^c, Ajay Gambhir^d, , Annela Anger-Kraavi^a, Elin May^a, Ben McWilliams^f,
Baptiste Boltier^g

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Highlights

- The study evaluates 27 low-carbon innovations based on a global survey of 260 experts.
- Innovations were clustered and ranked based on mitigation potentials and feasibility.
- Next-generation energy storage had the highest potential among examined technologies.
- Most non-technological innovations feature uniformly high potentials and feasibility.
- We note gaps among different stakeholder groups—e.g., regarding building innovations.

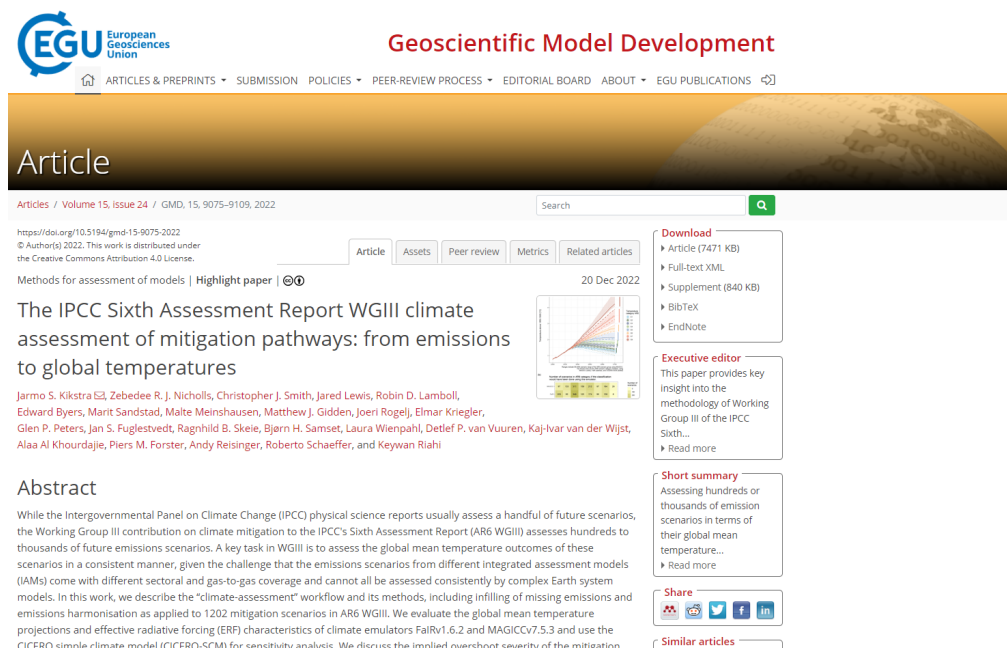
Figure 2. Preview of ‘Expert perceptions of game-changing innovations towards net zero’ in Energy Strategy Reviews

2.3 Kikstra et al. (2022), Geoscientific Model Development

Title:	The IPCC Sixth Assessment Report WGIII climate assessment of mitigation pathways: from emissions to global temperatures
Authors:	Jarmo S. Kikstra, Zebedee R. J. Nicholls, Christopher J. Smith, Jared Lewis, Robin D. Lamboll (Imperial), Edward Byers, Marit Sandstad, Malte Meinshausen, Matthew J. Gidden, Joeri Rogelj, Elmar Kriegler, Glen P. Peters (CICERO), Jan S. Fuglestad, Ragnhild B. Skeie, Bjørn H. Samset, Laura Wienpahl, Detlef P. van Vuuren, Kaj-Ivar van der Wijst, Alaa Al Khourdajie (Imperial), Piers M. Forster, Andy Reisinger, Roberto Schaeffer, Keywan Riahi
Journal:	Geoscientific Model Development
Abstract:	While the Intergovernmental Panel on Climate Change (IPCC) physical science reports usually assess a handful of future scenarios, the Working Group III contribution on climate mitigation to the IPCC's Sixth Assessment Report (AR6 WGIII) assesses hundreds to thousands of future emissions scenarios. A key task in WGIII is to assess the global mean temperature outcomes of these scenarios in a consistent manner, given the challenge that the emissions scenarios from different integrated assessment models (IAMs) come with different sectoral and gas-to-gas coverage and cannot all be assessed consistently by complex Earth system models. In this work, we describe the "climate-assessment" workflow and its methods, including infilling of missing emissions and emissions harmonisation as applied to 1202 mitigation scenarios in AR6 WGIII. We evaluate the global mean temperature projections and effective radiative forcing (ERF) characteristics of climate emulators FaIRv1.6.2 and MAGICCv7.5.3 and use the CICERO simple climate model (CICERO-SCM) for sensitivity analysis. We discuss the implied overshoot severity of the mitigation pathways using overshoot degree years and look at emissions and temperature characteristics of scenarios compatible with one possible interpretation of the Paris Agreement. We find that the lowest class of emissions scenarios that limit global warming to "1.5 °C (with a probability of greater than 50 %) with no or limited overshoot" includes 97 scenarios for MAGICCv7.5.3 and 203 for FaIRv1.6.2. For the MAGICCv7.5.3 results, "limited overshoot" typically implies exceedance of median temperature projections of up to about 0.1 °C for up to a few decades before returning to below 1.5 °C by or before the year 2100. For more than half of the scenarios in this category that comply with three criteria for being "Paris-compatible", including net-zero or net-negative greenhouse gas (GHG) emissions, median temperatures decline by about 0.3–0.4 °C after peaking at 1.5–1.6 °C in 2035–2055. We compare the methods applied in AR6 with the methods used for SR1.5 and discuss their implications. This article also introduces a "climate-assessment" Python package which allows for fully reproducing the IPCC AR6 WGIII temperature assessment. This work provides a community tool for assessing the temperature outcomes of emissions pathways and provides a basis for further work such as extending the workflow to include downscaling of climate characteristics to a regional level and calculating impacts.
Keywords:	Global modelling
DOI:	https://doi.org/10.5194/gmd-15-9075-2022
First Online:	20 December 2022
Repository:	Zenodo (Link: https://zenodo.org/records/7704528)

Synergies with: H2020 CONSTRAIN (GA: 820829), H2020 4C (GA: 82100360), H2020 ENGAGE (GA: 821471), H2020 GENIE (GA: 951542), H2020 ESM2025 (GA: 101003536)

Citation (APA): Kikstra, J. S., Nicholls, Z. R., Smith, C. J., Lewis, J., Lamboll, R. D., Byers, E., ... & Riahi, K. (2022). The IPCC Sixth Assessment Report WGIII climate assessment of mitigation pathways: from emissions to global temperatures. *Geoscientific Model Development*, 15(24), 9075-9109.



The screenshot shows the article page on the Geoscientific Model Development (GMD) website. The header includes the EGU logo and navigation links. The article title is prominently displayed, along with a graph showing temperature projections. The abstract is visible, and there are sections for download, executive editor, short summary, and share options.

Article
Articles / Volume 15, Issue 24 / GMD, 15, 9075–9109, 2022

<https://doi.org/10.5194/gmd-15-9075-2022>
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Methods for assessment of models | **Highlight paper** |  20 Dec 2022

The IPCC Sixth Assessment Report WGIII climate assessment of mitigation pathways: from emissions to global temperatures

Jarmo S. Kikstra , Zebedee R. J. Nicholls, Christopher J. Smith, Jared Lewis, Robin D. Lamboll, Edward Byers, Marit Sandstad, Malte Meinshausen, Matthew J. Gidden, Joeri Rogelj, Elmar Kriegler, Glen P. Peters, Jan S. Fuglestad, Ragnhild B. Skeie, Bjørn H. Samset, Laura Wienpahl, Detlef P. van Vuuren, Kaj-Ivar van der Wijst, Alaa Al Khourdajie, Piers M. Forster, Andy Reisinger, Roberto Schaeffer, and Keywan Riahi

Abstract

While the Intergovernmental Panel on Climate Change (IPCC) physical science reports usually assess a handful of future scenarios, the Working Group III contribution on climate mitigation to the IPCC's Sixth Assessment Report (AR6 WGIII) assesses hundreds to thousands of future emissions scenarios. A key task in WGIII is to assess the global mean temperature outcomes of these scenarios in a consistent manner, given the challenge that the emissions scenarios from different integrated assessment models (IAMs) come with different sectoral and gas-to-gas coverage and cannot all be assessed consistently by complex Earth system models. In this work, we describe the "climate-assessment" workflow and its methods, including infilling of missing emissions and emissions harmonisation as applied to 1202 mitigation scenarios in AR6 WGIII. We evaluate the global mean temperature projections and effective radiative forcing (ERF) characteristics of climate emulators FalsRv1.6.2 and MAGICCv7.5.3 and use the CICERO simple climate model (CICERO-SCM) for sensitivity analysis. We discuss the implied overshoot severity of the mitigation

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2.4 Gambhir (2023), Environmental Research Letters

Title:	This really does change everything: attaining 1.5C needs all available mitigation levers
Authors:	Ajay Gambhir (Imperial)
Journal:	Environmental Research Letters
Abstract:	There are multiple ways in which society can theoretically transition from its current carbon-intensive state to a zero-carbon future, ideally fast enough to limit global warming to 1.5°C above pre-industrial levels. Although the carbon budget associated with this temperature is close to being consumed (IPCC 2021), it still remains achievable - just. Furthermore, we know what needs to be done to achieve it, because we know what contributes to CO₂ emissions. We need energy sources, whose carbon content results in emissions. Reducing both our demand for energy and its carbon intensity (by increasing the share of zero-carbon fuels in our energy mix) is thus of paramount importance. Some industrial manufacturing processes, particularly in cement production, produce CO₂ as a chemical by-product. Capturing that CO₂, finding alternative ways to produce cement, or reducing cement demand, is therefore necessary. Our agriculture, forestry and other land use (AFOLU) can be a net source or sink of CO₂, so making it a large net sink by enhancing carbon dioxide removals (CDR), for example through afforestation, would help. And we hope to have available a range of human-made CDR technologies and measures, such as bioenergy with carbon capture and storage (BECCS), Direct Air Capture (DAC) and enhanced weathering (EW). Scaling these in an environmentally sustainable way would enhance our chances of keeping within the carbon budget. Finally, rapid progress in reducing short-lived greenhouse gases, particularly methane, would further help our chances of achieving 1.5°C.
Keywords:	Global modelling
DOI:	https://doi.org/10.1088/1748-9326/acb6ab
First Online:	7 February 2023
Repository:	Zenodo (Link: https://zenodo.org/records/7704606)
Synergies with:	N/A
Citation (APA):	Gambhir, A. (2023). This really does change everything: attaining 1.5° C needs all available mitigation levers. Environmental Research Letters, 18(2), 022001.

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ENVIRONMENTAL RESEARCH LETTERS

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This really does change everything: attaining 1.5 °C needs all available mitigation levers

Ajay Gambhir¹
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[Environmental Research Letters](#) Volume 18 Number 2
Citation Ajay Gambhir 2023 *Environ. Res. Lett.* 18 022001
DOI 10.1088/1748-9326/acb6ab

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There are multiple ways in which society can theoretically transition from its current carbon-intensive state to a zero-carbon future, ideally fast enough to limit global warming to 1.5 °C above pre-industrial levels. Although the carbon budget associated with this temperature is close to being consumed (IPCC

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Gaussian copula modeling of extreme cold and weak-wind events over Europe conditioned on winter weather regimes

All options, not silver bullets, needed to limit global warming to 1.5 °C: a scenario appraisal

Figure 4. Preview of 'This really does change everything: attaining 1.5C needs all available mitigation levers' in Environmental Research Letters

2.5 Karamaneas et al. (2023), Renewable & Sustainable Energy Transition

Title:	A stakeholder-informed modelling study of Greece's energy transition amidst an energy crisis: the role of natural gas and climate ambition
Authors:	Anastasios Karamaneas (NTUA), Konstantinos Koasidis (NTUA), Natasha Frilingou (NTUA), Georgios Xexakis Alexandros Nikas (NTUA), Haris Doukas (NTUA)
Journal:	Renewable & Sustainable Energy Transition
Abstract:	While fossil fuel prices soar during the 2022 global energy crisis, the European Union activates all available fossil-fuel levers and Greece still plans to use natural gas as a transition fuel for delignitisation, with strong concerns over potential exacerbation of energy poverty and hurdles to progress in climate action. This study assesses the trajectory of the Greek electricity mix and its reliance on natural gas under the current policy framework on the one hand, and an ambitious scenario aiming for complete decarbonisation by 2035 on the other. We model these scenarios using an energy system modelling framework, comprising LEAP and OSeMOSYS model implementations for Greece, and use a stakeholder-informed fuzzy cognitive mapping exercise to uncover transition uncertainties. While power generation from natural gas is projected to increase by almost 50% until 2030 under existing policies, the proposed decarbonisation scenario has the potential to achieve complete independence from Russian gas by 2026 while also leading to a cleaner and considerably cheaper power sector. This 'higher climate ambition' scenario is found feasible and more robust in case high fossil fuel prices persist post-2022, even if bottlenecks stressed by stakeholders such as community acceptance or technological constraints emerge and potentially constrain the expansion of certain renewable energy technologies. Apart from the added value of stakeholder input in modelling science, as reflected in the impact of barriers Greek stakeholders critically highlighted, our results emphasise that a diversified energy-supply mix alongside bold energy efficiency strategies are key to rapid and feasible decarbonisation in the country.
Keywords:	Greece; LEAP; OSeMOSYS; Natural gas; Fuzzy cognitive maps; Energy crisis
DOI:	https://doi.org/10.1016/j.rset.2023.100049
First Online:	3 February 2023
Repository:	Zenodo (Link: https://zenodo.org/records/7704617)
Synergies with:	H2020 PARIS REINFORCE (GA: 820846)
Citation (APA):	Karamaneas, A., Koasidis, K., Frilingou, N., Xexakis, G., Nikas, A., & Doukas, H. (2023). A stakeholder-informed modelling study of Greece's energy transition amidst an energy crisis: The role of natural gas and climate ambition. <i>Renewable and Sustainable Energy Transition</i> , 3, 100049.

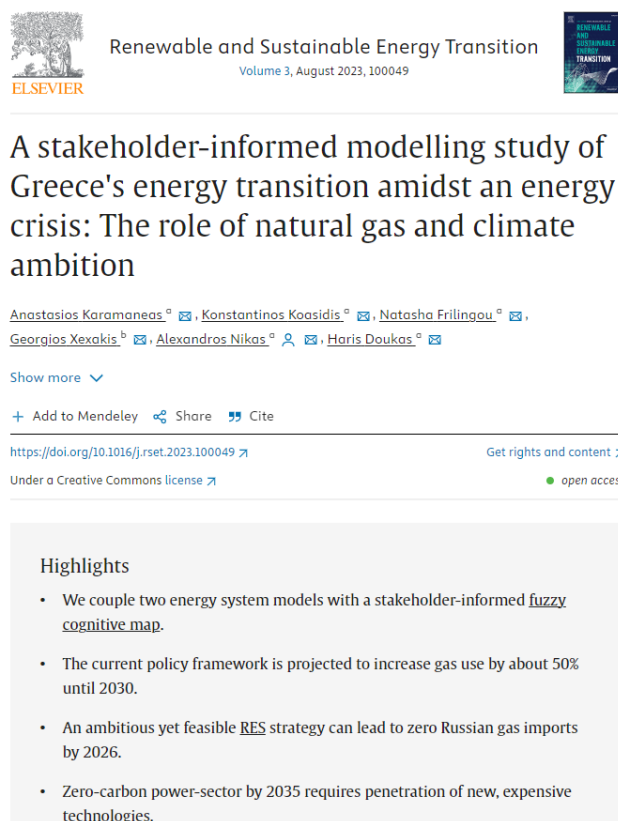


Figure 5. Preview of 'A stakeholder-informed modelling study of Greece's energy transition amidst an energy crisis: the role of natural gas and climate ambition' in Renewable & Sustainable Energy Transition

2.6 Gambhir & Lempert (2023), Frontiers in Climate

Title:	From least cost to least risk: Producing climate change mitigation plans that are resilient to multiple risks
Authors:	Ajay Gambhir (Imperial), Robert Lempert
Journal:	Frontiers in Climate
Abstract:	Our plans to tackle climate change could be thrown off-track by shocks such as the coronavirus pandemic, the energy supply crisis driven by the Russian invasion of Ukraine, financial crises and other such disruptions. We should therefore identify plans which are as resilient as possible to future risks, by systematically understanding the range of risks to which mitigation plans are vulnerable and how best to reduce such vulnerabilities. Here, we use electricity system decarbonization as a focus area, to highlight the different types of technological solutions, the different risks that may be associated with them, and the approaches, situated in a decision-making under deep uncertainty (DMDU) paradigm, that would allow the identification and enhanced resilience of mitigation pathways.
Keywords:	Extremes
DOI:	https://doi.org/10.3389/fclim.2023.1149309
First Online:	17 April 2023
Repository:	Zenodo (Link: https://zenodo.org/records/7983105)
Synergies with:	N/A
Citation (APA):	Gambhir, A., & Lempert, R. (2023). From least cost to least risk: Producing climate change mitigation plans that are resilient to multiple risks. <i>Frontiers in Climate</i> , 5, 1149309.



Figure 6. Preview of 'From least cost to least risk: Producing climate change mitigation plans that are resilient to multiple risks' in Frontiers in Climate

2.7 Tsipouridis et al. (2023), Technical Annals

Title:	The Importance of “Loss and Damage” in Supporting Climate Policy Debate
Authors:	Ioannis Tsipouridis (TUM), Ngetich E. Kiprotich, Anita Jerotich Chebii, Nektarios Matsagkos (NTUA), Georgios P. Trachanas (NTUA)
Journal:	Technical Annals
Abstract:	Climate change is having profound impacts on human and natural systems. In recent years, there has been growing recognition of the need to address Loss and Damage (L&D) associated with the adverse effects of climate change, particularly in developing countries that are more vulnerable to its impacts. There is a range of studies, examining the concepts, resilience, adaptation and policy options for dealing with climate change losses and damages. This article discusses the actions, research and finance needs in Loss & Damage as well as the approaches to it on some topics such as adaptation, stakeholder engagement, governance and risk transfer.
Keywords:	Loss, Damage, Climate, Impact, Policy
DOI:	https://doi.org/10.12681/ta.34133
First Online:	28 April 2023
Repository:	Zenodo (Link:)
Synergies with:	N/A
Citation (APA):	Tsipouridis, I., E. Kiprotich, N., Chebii, A. J., Matsagkos, N., & Trachanas, G. P. (2023). The Importance of “Loss and Damage” in Supporting Climate Policy Debate. Technical Annals, 1(2). https://doi.org/10.12681/ta.34133

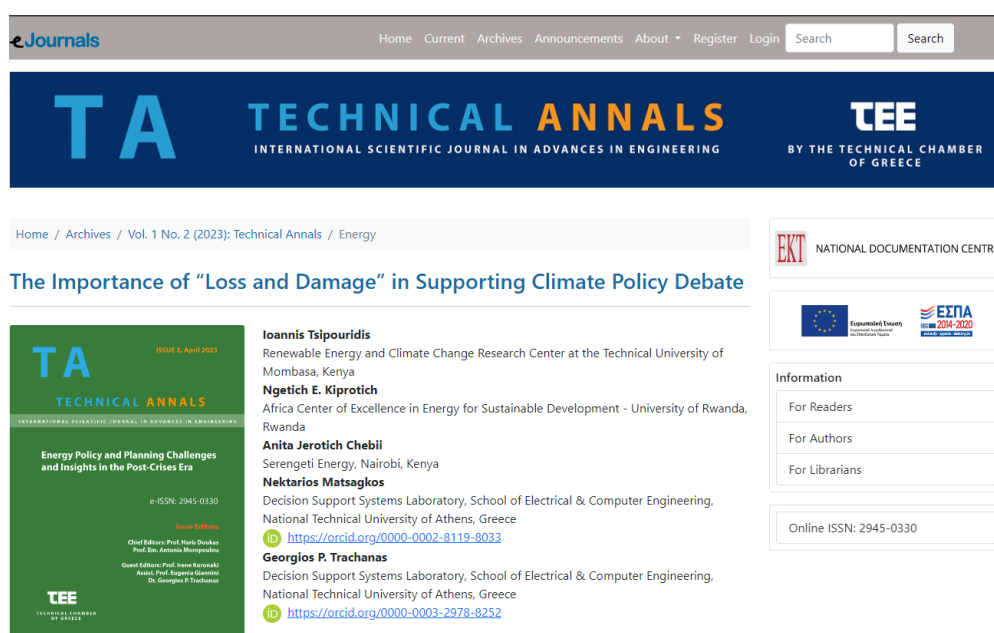


Figure 7. Preview of ‘The Importance of “Loss and Damage” in Supporting Climate Policy Debate’ in Technical Annals

2.8 Van de Ven et al. (2023), Nature Climate Change

Title:	A multi-model analysis of post-Glasgow climate targets and feasibility challenges
Authors:	Dirk-Jan van de Ven (BC3), Shivika Mittal (Imperial), Ajay Gambhir (Imperial), Robin Lamboll (Imperial), Haris Doukas (NTUA), Sara Giarola (Imperial), Adam Hawkes (Imperial), Konstantinos Koasidis (NTUA), Alexandre C. Koberle (Imperial), Haewon McJeon, Sigit Perdana, Glen P. Peters (CICERO), Joeri Rogelj, Ida Sognnaes (CICERO), Marc Vielle, Alexandros Nikas (NTUA)
Journal:	Nature Climate Change
Abstract:	The COP26 Glasgow process resulted in many countries strengthening their 2030 emissions reduction targets and announcing net-zero pledges for 2050–2070 but it is not clear how this would impact future warming. Here, we use four diverse integrated assessment models (IAMs) to assess CO ₂ emission trajectories in the near- and long-term on the basis of national policies and pledges, combined with a non-CO ₂ infilling model and a simple climate model to assess the temperature implications. We also consider the feasibility of national long-term pledges towards net-zero. While near-term pledges alone lead to warming above 2 °C, the addition of long-term pledges leads to emissions trajectories compatible with a future well below 2 °C, across all four IAMs. However, while IAM heterogeneity translates to diverse decarbonization pathways towards long-term targets, all modelled pathways indicate several feasibility concerns, relating to the cost of mitigation and the rates and scales of deployed technologies and measures.
Keywords:	global modelling; regional modelling; synergies
DOI:	https://doi.org/10.1038/s41558-023-01661-0
First Online:	18 May 2023
Repository:	Zenodo (Link: https://zenodo.org/records/7982967)
Synergies with:	H2020 PARIS REINFORCE (GA: 820846), H2020 PROVIDE (GA: 101003687)
Citation (APA):	van de Ven, D. J., Mittal, S., Gambhir, A., Lamboll, R. D., Doukas, H., Giarola, S., ... & Nikas, A. (2023). A multimodel analysis of post-Glasgow climate targets and feasibility challenges. <i>Nature Climate Change</i> , 1-9.

A multimodel analysis of post-Glasgow climate targets and feasibility challenges

Dirk-Jan van de Ven , Shivika Mittal, Ajay Gambhir, Robin D. Lamboll, Haris Doukas, Sara Giarola, Adam Hawkes, Konstantinos Koasidis, Alexandre C. Köberle, Haewon McJeon, Sigit Perdana, Glen P. Peters, Joeri Rogelj, Ida Sognnaes, Marc Velle & Alexandros Nikas

Nature Climate Change **13**, 570–578 (2023) | [Cite this article](#)

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Abstract

The COP26 Glasgow process resulted in many countries strengthening their 2030 emissions reduction targets and announcing net-zero pledges for 2050–2070 but it is not clear how this would impact future warming. Here, we use four diverse integrated assessment models (IAMs) to assess CO₂ emission trajectories in the near- and long-term on the basis of national policies and pledges, combined with a non-CO₂ infilling model and a simple climate model to assess the temperature implications. We also consider the feasibility of national long-term pledges towards net-zero. While near-term pledges alone lead to warming above 2 °C, the addition of long-term pledges leads to emissions trajectories compatible with a future well below 2 °C, across all four IAMs. However, while IAM heterogeneity translates to diverse decarbonization pathways towards long-term targets, all modelled pathways indicate several feasibility concerns, relating to the cost of mitigation and the rates and scales of deployed technologies and measures.

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Figure 8. Preview of 'A multi-model analysis of post-Glasgow climate targets and feasibility challenges' in Nature Climate Change

2.9 Sampedro et al. (2023), The Lancet Planetary Health

Title:	Short-term health co-benefits of existing climate policies: the need for more ambitious and integrated policy action
Authors:	Jon Sampedro (BC3), Anil Markandya (BC3), Clàudia Rodés-Bachs (BC3), Dirk-Jan Van de Ven (BC3)
Journal:	The Lancet Planetary Health
Abstract:	Climate change and air pollution are two interconnected major risks for human health. For calculations of the health co-benefits, we combine the Global Change Analysis Model (GCAM) with rfasst, a tool designed to calculate a range of adverse health and agricultural effects attributable to air pollution for alternative scenarios. In summary, health co-benefits associated with current policies and nationally determined contributions are relatively small. The results show that to reduce health impacts attributable to ambient air pollution rapidly, additional policy action that is explicitly designed for tackling air pollutant emissions will be needed.
Keywords:	Climate policies; health
DOI:	https://doi.org/10.1016/S2542-5196(23)00126-2
First Online:	31 July 2023
Repository:	Zenodo (Link: https://zenodo.org/records/8354769)
Synergies with:	N/A
Citation (APA):	Sampedro, J., Markandya, A., Rodés-Bachs, C., & Van de Ven, D. J. (2023). Short-term health co-benefits of existing climate policies: the need for more ambitious and integrated policy action. The Lancet Planetary Health, 7(7), e540-e541.

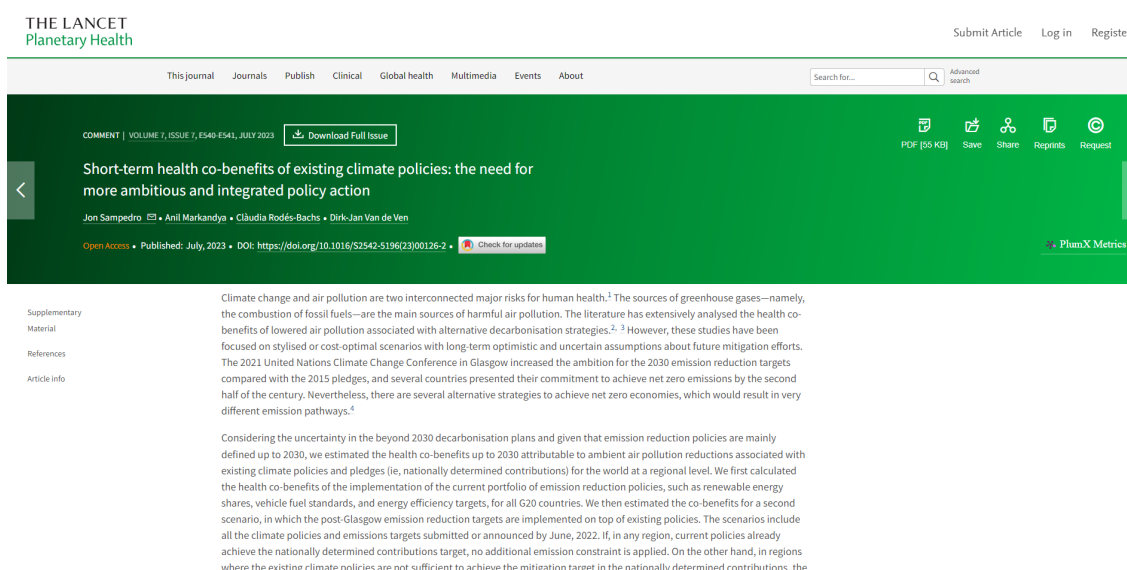


Figure 9. Preview of 'Short-term health co-benefits of existing climate policies: the need for more ambitious and integrated policy action' in The Lancet Planetary Health

2.10 Gambhir & Nikas (2023), PLOS Climate

Title:	Seven key principles for assessing emerging low-carbon technological opportunities for climate change mitigation action
Authors:	Ajay Gambhir (Imperial), Alexandros Nikas (NTUA)
Journal:	PLOS Climate
Abstract:	The proposed framework is an intuitively obvious one yet still serves as a climate technology-specific “checklist” to ensure that any newly proposed technologies or products can succeed. There will be continuous changes to the regulations, infrastructures, and political contexts, in which new technologies will be developed, which is why each consideration is not intended as a one-shot “yes/no” process but must rather be continuously reviewed and reconsidered in light of potentially rapid developments.
Keywords:	Low-carbon; climate change mitigation
DOI:	https://doi.org/10.1371/journal.pclm.0000235
First Online:	10 July 2023
Repository:	Zenodo (Link: https://zenodo.org/records/8183549)
Synergies with:	HE DIAMOND (GA: 101081179)
Citation (APA):	Gambhir, A., & Nikas, A. (2023). Seven key principles for assessing emerging low-carbon technological opportunities for climate change mitigation action. PLOS Climate, 2(7), e0000235.

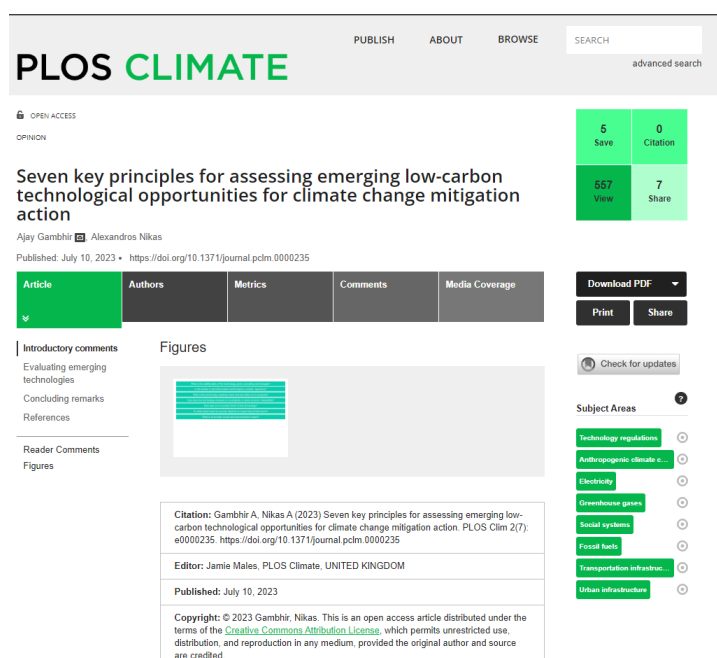
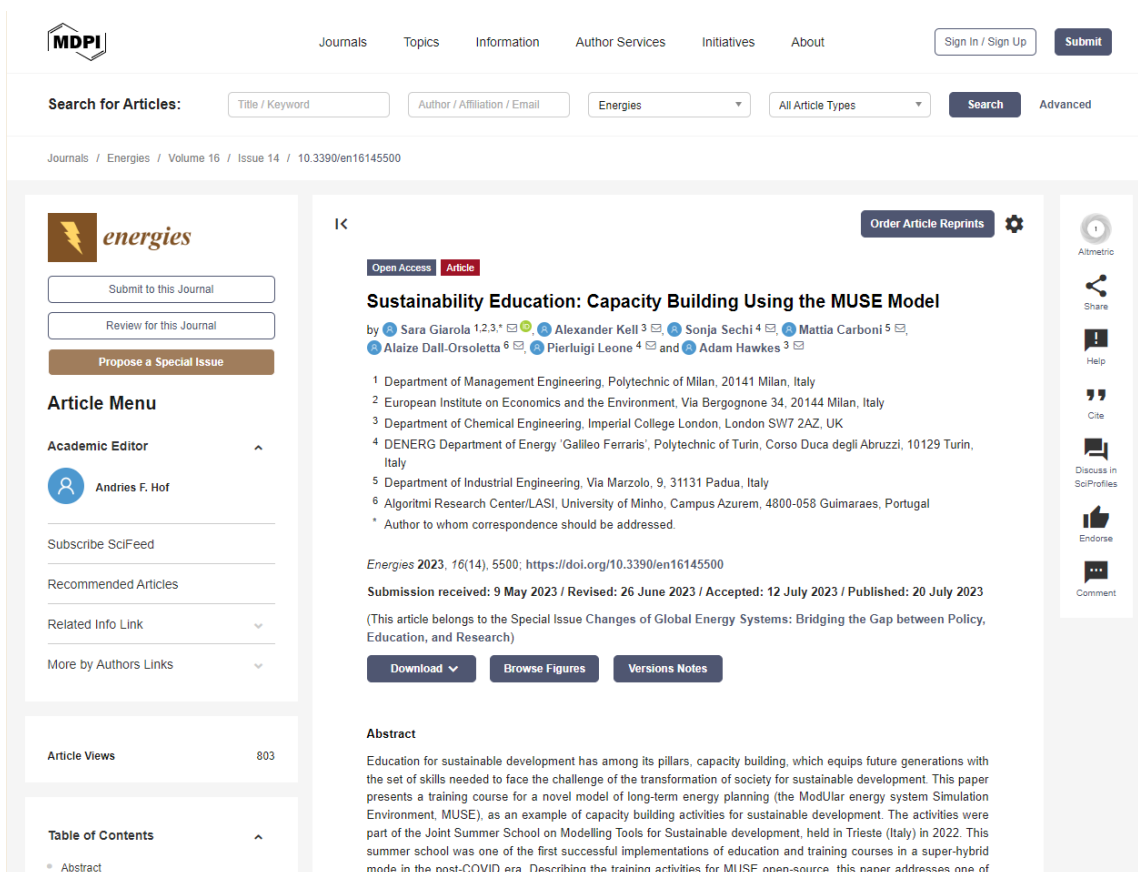


Figure 10. Preview of 'Seven key principles for assessing emerging low-carbon technological opportunities for climate change mitigation action' in PLOS Climate

2.11 Giarola et al. (2023), Energies

Title:	Sustainability Education: Capacity Building Using the MUSE Model
Authors:	Sara Giarola (Imperial), Alexander Kell (Imperial), Sonja Sechi (POLIMI), Mattia Carboni, Mattia Carboni, Pierluigi Leone, Adam Hawkes (Imperial)
Journal:	Energies
Abstract:	Education for sustainable development has among its pillars, capacity building, which equips future generations with the set of skills needed to face the challenge of the transformation of society for sustainable development. This paper presents a training course for a novel model of long-term energy planning (the ModUlar energy system Simulation Environment, MUSE), as an example of capacity building activities for sustainable development. The activities were part of the Joint Summer School on Modelling Tools for Sustainable development, held in Trieste (Italy) in 2022. This summer school was one of the first successful implementations of education and training courses in a super-hybrid mode in the post-COVID era. Describing the training activities for MUSE open-source, this paper addresses one of the challenges that education for sustainable development is expected to increasingly face in the future: the training of future professionals in the use of novel toolkits and the implementation of truly trans-disciplinary approaches. This paper discusses the pre-school online training course for MUSE, the summer school contents, and some student modeling outcomes. While doing so, it shows the importance of leveraging the abstract contents of a course with practical exercises when learning a new tool. Reflecting upon the students' experience, this paper draws conclusions that can be used to improve future editions of the same course and be extended to the design of training courses for other tools.
Keywords:	energy system modeling; integrated assessment modeling; education; open university; sustainable development goals
DOI:	https://doi.org/10.3390/en16145500
First Online:	20 July 2023
Repository:	Zenodo (Link: https://zenodo.org/records/8427214)
Synergies with:	N/A
Citation (APA):	Giarola, S., Kell, A., Sechi, S., Carboni, M., Dall-Orsoletta, A., Leone, P., & Hawkes, A. (2023). Sustainability Education: Capacity Building Using the MUSE Model. <i>Energies</i> , 16(14), 5500.



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Sustainability Education: Capacity Building Using the MUSE Model

by Sara Giarola ^{1,2,3,*}, Alexander Kell ³, Sonja Sechi ⁴, Mattia Carboni ⁵, Alaize Dall'Orsoletta ⁶, Pierluigi Leone ⁴ and Adam Hawkes ³

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* Author to whom correspondence should be addressed.

Energies **2023**, *16*(14), 5500; <https://doi.org/10.3390/en16145500>

Submission received: 9 May 2023 / Revised: 26 June 2023 / Accepted: 12 July 2023 / Published: 20 July 2023
(This article belongs to the Special Issue Changes of Global Energy Systems: Bridging the Gap between Policy, Education, and Research)

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Abstract

Education for sustainable development has among its pillars, capacity building, which equips future generations with the set of skills needed to face the challenge of the transformation of society for sustainable development. This paper presents a training course for a novel model of long-term energy planning (the ModUlar energy system Simulation Environment, MUSE), as an example of capacity building activities for sustainable development. The activities were part of the Joint Summer School on Modelling Tools for Sustainable development, held in Trieste (Italy) in 2022. This summer school was one of the first successful implementations of education and training courses in a super-hybrid mode in the post-COVID era. Describing the training activities for MUSE open-source, this paper addresses one of

Figure 11. Preview of 'Sustainability Education: Capacity Building Using the MUSE Model' in Energies

2.12 Gambhir et al. (2023), Nature Communications

Title:	Adjusting 1.5 degree C climate change mitigation pathways in light of adverse new information
Authors:	Ajay Gambhir (Imperial), Shivika Mittal (Imperial), Robin D. Lamboll (Imperial), Neil Grant (Imperial), Dan Bernie, Laila Gohar, Adam Hawkes (Imperial), Alexandre Köberle (Imperial), Joeri Rogelj, Jason A. Lowe
Journal:	Nature Communications
Abstract:	Understanding how 1.5 °C pathways could adjust in light of new adverse information, such as a reduced 1.5 °C carbon budget, or slower-than-expected low-carbon technology deployment, is critical for planning resilient pathways. We use an integrated assessment model to explore potential pathway adjustments starting in 2025 and 2030, following the arrival of new information. The 1.5 °C target remains achievable in the model, in light of some adverse information, provided a broad portfolio of technologies and measures is still available. If multiple pieces of adverse information arrive simultaneously, average annual emissions reductions near 3 GtCO ₂ /yr for the first five years following the pathway adjustment, compared to 2 GtCO ₂ /yr in 2020 when the Covid-19 pandemic began. Moreover, in these scenarios of multiple simultaneous adverse information, by 2050 mitigation costs are 4-5 times as high as a no adverse information scenario, highlighting the criticality of developing a wide range of mitigation options, including energy demand reduction options.
Keywords:	Climate change mitigation; pathways; information
DOI:	https://doi.org/10.1038/s41467-023-40673-4
First Online:	23 August 2023
Repository:	Zenodo (Link: https://zenodo.org/records/8354921)
Synergies with:	UK Foreign, Commonwealth & Development Office Climate Compatible Growth (GA: GB-GOV-1-300125)
Citation (APA):	Gambhir, A., Mittal, S., Lamboll, R. D., Grant, N., Bernie, D., Gohar, L., ... & Lowe, J. A. (2023). Adjusting 1.5 degree C climate change mitigation pathways in light of adverse new information. <i>Nature Communications</i> , 14(1), 5117.

Adjusting 1.5 degree C climate change mitigation pathways in light of adverse new information

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Nature Communications **14**, Article number: 5117 (2023) | [Cite this article](#)

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Abstract

Understanding how 1.5 °C pathways could adjust in light of new adverse information, such as a reduced 1.5 °C carbon budget, or slower-than-expected low-carbon technology deployment, is critical for planning resilient pathways. We use an integrated assessment model to explore potential pathway adjustments starting in 2025 and 2030, following the arrival of new information. The 1.5 °C target remains achievable in the model, in light of some adverse information, provided a broad portfolio of technologies and measures is still available. If multiple pieces of adverse information arrive simultaneously, average annual emissions reductions near 3 GtCO₂/yr for the first five years following the pathway adjustment, compared to 2 GtCO₂/yr in 2020 when the Covid-19 pandemic began. Moreover, in these scenarios of multiple simultaneous adverse information, by 2050 mitigation costs are 4-5 times as high as a no adverse information scenario, highlighting the criticality of developing a wide range of mitigation options, including energy demand reduction options.

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Figure 12. Preview of 'Adjusting 1.5 degree C climate change mitigation pathways in light of adverse new information' in Nature Communications

2.13 Peters et al. (2023), npj Climate Action

Title:	AR6 scenarios database: an assessment of current practices and future recommendations
Authors:	Glen P. Peters (CICERO), Alaa Al Khourdajie (Imperial), Ida Sognnaes (CICERO), Benjamin M. Sanderson (CICERO)
Journal:	npj Climate Action
Abstract:	Mitigation scenarios have become an important element of Intergovernmental Panel on Climate Change (IPCC) reports. We critically assess the curation of the IPCC mitigation scenarios database, with a focus on improving curation and utilisation. The existing method of curation favours particular models, and results may have limited statistical meaning. We draw lessons from experiences with the Coupled Model Intercomparison Project (CMIP) used by the IPCC Working Group I and II communities. We propose that the scientific community takes a more active role in curating the database around policy-relevant knowledge gaps, through an open and peer reviewed process of Model Intercomparison Projects (MIPs) supplemented with individual model studies. The database should be publicly accessible from the time of scenario submission, and actively involve a broad community in developing tools and analysing the database. These suggestions can broaden participation, increase transparency, and enhance the relevance of the database for users.
Keywords:	Current practices; AR6
DOI:	https://doi.org/10.1038/s44168-023-00050-9
First Online:	7 September 2023
Repository:	Zenodo (Link: https://zenodo.org/records/8427170)
Synergies with:	N/A
Citation (APA):	Peters, G. P., Al Khourdajie, A., Sognnaes, I., & Sanderson, B. M. (2023). AR6 scenarios database: an assessment of current practices and future recommendations. npj Climate Action, 2(1), 31.

AR6 scenarios database: an assessment of current practices and future recommendations

Glen P. Peters , Alaa Al Khourdajie , Ida Sognnaes & Benjamin M. Sanderson

npj Climate Action **2**, Article number: 31 (2023) | [Cite this article](#)

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Abstract

Mitigation scenarios have become an important element of Intergovernmental Panel on Climate Change (IPCC) reports. We critically assess the curation of the IPCC mitigation scenarios database, with a focus on improving curation and utilisation. The existing method of curation favours particular models, and results may have limited statistical meaning. We draw lessons from experiences with the Coupled Model Intercomparison Project (CMIP) used by the IPCC Working Group I and II communities. We propose that the scientific community takes a more active role in curating the database around policy-relevant knowledge gaps, through an open and peer reviewed process of Model Intercomparison Projects (MIPs) supplemented with individual model studies. The database should be publicly accessible from the time of scenario submission, and actively involve a broad community in developing tools and analysing the database. These suggestions can broaden participation, increase transparency, and enhance the relevance of the database for users.

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Figure 13. Preview of 'AR6 scenarios database: an assessment of current practices and future recommendations' in npj Climate Action

2.14 Wachsmuth et al. (2023), Renewable and Sustainable Energy Transition

Title:	Co-creating socio-technical scenarios for net-zero emission pathways: comparison of five national case studies
Authors:	Jakob Wachsmuth, Philine Warnke, Ajay Gambhir (Imperial), Sara Giarola (Imperial), Konstantinos Koasidis (NTUA), Shivika Mittal (Imperial), Alexandros Nikas (NTUA), Kathleen Vaillancourt, Haris Doukas (NTUA)
Journal:	Renewable and Sustainable Energy Transition
Abstract:	The extent to which modelled future pathways support effective policymaking for sustainability transitions has been questioned for a long time, with one major issue being the insufficient integration with the perspectives of policymakers and other stakeholders. One proposal to address this issue has been to set up facilitative dialogues with stakeholders to extend model-based pathways to socio-technical scenarios. This paper presents the results of a first series of such co-creation workshops, where stakeholders discussed bottlenecks for model-based decarbonisation pathways and ways to overcome these bottlenecks through tailored policy mixes. The workshops took place in five countries: Brazil, Canada, Greece, Germany, and the UK, each with a specific sector focus. In all five workshops, it became clear that substantial tensions exist between the “ideal” modelled decarbonisation pathways and the real-world situation on the ground. Also, adverse political framework conditions, uncertainty of future policies and resistance of powerful actors were emphasised as overarching bottlenecks in most workshops. At the same time, in several instances stakeholders pointed out important aspects of transformative trajectories that are not covered by the models. Some challenges and solutions stand out in all countries in spite of the strong diversity of contexts: allocation of capital towards massive investments into low-carbon solutions; infrastructure development for generation and transport of hydrogen, capture and use of CO ₂ as well as electricity grid and storage adapted to renewable energy solutions; stakeholder and citizen dialogues, where agreement is reached on cornerstones of long-term decarbonisation trajectories; and demand-side measures complementing investments into low-carbon processes.
Keywords:	Transition bottlenecks; Sectoral transformations; Stakeholder integration; Transformative policy mix; Foresight; Techno-economic modelling
DOI:	https://doi.org/10.1016/j.rset.2023.100064
First Online:	20 September 2023
Repository:	Zenodo (Link: https://zenodo.org/records/8354976)
Synergies with:	H2020 PARIS REINFORCE (GA: 820846)
Citation (APA):	Wachsmuth, J., Warnke, P., Gambhir, A., Giarola, S., Koasidis, K., Mittal, S., ... & Doukas, H. (2023). Co-creating socio-technical scenarios for net-zero emission pathways: Comparison of five national case studies. <i>Renewable and Sustainable Energy Transition</i> , 4, 100064.



Renewable and Sustainable Energy Transition

Volume 4, August 2023, 100064



Full-length article

Co-creating socio-technical scenarios for net-zero emission pathways: Comparison of five national case studies

Jakob Wachsmuth^a, , , Philine Warnke^a, Ajay Gambhir^b, Sara Giarola^c,
Konstantinos Koasidis^d, Shivika Mittal^b, Alexandros Nikas^d, Kathleen Vaillancourt^e,
Haris Doukas^d

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Highlights

- We combine techno-economic modelling, socio-technical analyses and co-creation.
- We demonstrate this in case studies for Brazil, Canada, Germany, Greece and UK.
- Stakeholders identified key bottlenecks for transitions to net-zero emissions.

Figure 14. Preview of 'Co-creating socio-technical scenarios for net-zero emission pathways: comparison of five national case studies' in Renewable and Sustainable Energy Transition

2.15 Koutsandreas et al. (2023), Energy Strategy Reviews

Title:	A multicriteria modeling approach for evaluating power generation scenarios under uncertainty: The case of green hydrogen in Greece
Authors:	Diamantis Koutsandreas (Aalto), Georgios P. Trachanas (NTUA), Ioannis Pappis, Alexandros Nikas (NTUA), Haris Doukas (NTUA), John Psarras (NTUA)
Journal:	Energy Strategy Reviews
Abstract:	Clean energy technological innovations are widely acknowledged as a prerequisite to achieving ambitious long-term energy and climate targets. However, the optimal speed of their adoption has been parsimoniously studied in the literature. This study seeks to identify the optimal intensity of moving to a green hydrogen electricity sector in Greece, using the OSeMOSYS energy modeling framework. Green hydrogen policies are evaluated, first, on the basis of their robustness against uncertainty and, afterwards, against conflicting performance criteria and for different decision-making profiles towards risk, by applying the VIKOR and TOPSIS multi-criteria decision aid methods. Although our analysis focuses exclusively on the power sector and compares different rates of hydrogen penetration compared to a business-as-usual case without considering other game-changing innovations (such as other types of storage or carbon capture and storage), we find that a national transition to a green hydrogen economy can support Greece in potentially cutting at least 16 MtCO ₂ while stimulating investments of EUR 10–13 bn. over 2030–2050.
Keywords:	Energy system modelling; Energy planning; OSeMOSYS-Greece; VIKOR; TOPSIS
DOI:	https://doi.org/10.1016/j.esr.2023.101233
First Online:	10 October 2023
Repository:	Zenodo (Link: https://zenodo.org/records/8427501)
Synergies with:	H2020 PARIS REINFORCE (GA: 820846), HE DIAMOND (GA: 101081179)
Citation (APA):	Koutsandreas, D., Trachanas, G., Pappis, I., Nikas, A., Doukas, H., & Psarras, J. (2023). A multicriteria modeling approach for evaluating power generation scenarios under uncertainty: the case of green hydrogen in Greece. <i>Energy Strategy Rev.</i>



Energy Strategy Reviews
Volume 50, November 2023, 101233



A multicriteria modeling approach for evaluating power generation scenarios under uncertainty: The case of green hydrogen in Greece

Diamantis Koutsandreas ^{a, b}, Georgios P. Trachanas ^a, Ioannis Pappis ^c, Alexandros Nikas ^a
Haris Doukas ^a, John Psarras ^a

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<https://doi.org/10.1016/j.esr.2023.101233>

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Highlights

- The proposed modeling approach stresses the importance of policymakers' risk profiles.
- A green hydrogen strategy could help Greece cut at least 16 MtCO₂ over 2030–2050.
- It could also stimulate about EUR 10–13 bn. of investments over the same period

Figure 15. Preview of 'A multicriteria modeling approach for evaluating power generation scenarios under uncertainty: The case of green hydrogen in Greece' in Energy Strategy Reviews

2.16 Anderson et al. (2023), Nature Reviews Earth & Environment

Title:	Controversies of carbon dioxide removal
Authors:	Kevin Anderson, Holly Jean Buck, Lili Fuhr, Oliver Geden, Glen P. Peters (CICERO), Eve Tamme
Journal:	Nature Reviews Earth & Environment
Abstract:	Various methods of carbon dioxide removal (CDR) are being pursued in response to the climate crisis, but they are mostly not proven at scale. Climate experts are divided over whether CDR is a necessary requirement or a dangerous distraction from limiting emissions. In this viewpoint, six experts offer their views on the CDR debate.
Keywords:	Carbon dioxide removal
DOI:	https://doi.org/10.1038/s43017-023-00493-y
First Online:	16 November 2023
Repository:	Zenodo (Link: https://zenodo.org/records/10301846)
Synergies with:	N/A
Citation (APA):	Anderson, K., Buck, H. J., Fuhr, L., Geden, O., Peters, G. P., & Tamme, E. (2023). Controversies of carbon dioxide removal. <i>Nature Reviews Earth & Environment</i> , 1-7.



Figure 16. Preview of 'Controversies of carbon dioxide removal' in Nature Reviews Earth & Environment

2.17 Boitier et al. (2023), Joule

Title:	A multi-model analysis of the EU's path to net zero
Authors:	Baptiste Boitier, Alexandros Nikas (NTUA), Ajay Gambhir (Imperial), Konstantinos Koasidis (NTUA), Alessia Elia, Khaled Al-Dabbas, Şirin Alibaş, Lorenza Campagnolo, Alessandro Chiodi, Elisa Delpiazzi, Haris Doukas (NTUA), Arnaud Fougeyrollas, Maurizio Gargiulo, Pierre Le Mouël, Felix Neuner, Sigit Perdana, Dirk-Jan van de Ven (BC3), Marc Vielle, Paul Zagamé, Shivika Mittal (Imperial)
Journal:	Joule
Abstract:	The EU has committed to becoming a net-zero economy by 2050, with many member states having integrated this goal into national strategies. However, the bloc's path toward achieving these targets remains unclear. We use five whole-system climate-economy models and two sectoral models to explore how the EU can keep net zero within reach by mid-century, offering insights into intermediate milestones and implications at sectoral and national levels. Our results indicate that a 62% emissions reduction in the Emissions Trading System and 40% in the Effort Sharing Regulation, compared with 2005 levels, are in line with cost-optimal paths toward the bloc's 55% emissions cuts target by 2030. Bridging the gap with net zero in 2050 entails near-complete decarbonization of ETS, total decarbonization of electricity, and complete phaseout of unabated coal power by 2040, as well as rapid scale-up of negative emissions technologies and an 80% diffusion of renewables in the EU electricity mix by 2050.
Keywords:	Modelling; IAM; net-zero
DOI:	https://doi.org/10.1016/j.joule.2023.11.002
First Online:	23 November 2023
Repository:	Zenodo (Link: https://zenodo.org/records/10213459)
Synergies with:	H2020 PARIS REINFORCE (GA: 820846), HE DIAMOND (GA: 101081179)
Citation (APA):	Boitier, B., Nikas, A., Gambhir, A., Koasidis, K., Elia, A., Al-Dabbas, K., ... & Mittal, S. (2023). A multi-model analysis of the EU's path to net zero. Joule.

Joule



Available online 23 November 2023

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Article

A multi-model analysis of the EU's path to net zero

Baptiste Boitier¹, Alexandros Nikas^{2,12}, [Ajay Gambhir](#)³, Konstantinos Koasidis², Alessia Elia⁴, Khaled Al-Dabbas⁵, Şirin Alibas⁵, Lorenza Campagnolo^{6,7}, Alessandro Chiodi⁴, Elisa Delpiazzo^{6,7,8}, Haris Doukas², Arnaud Fougevrollas¹, Maurizio Garciulo⁴, Pierre Le Mouél¹, Felix Neuner⁵, Sigit Perdana⁹, Dirk-Jan van de Ven¹⁰, Marc Vielle⁹, Paul Zaqar^{1,11}, Shivika Mittal³

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Highlights

- We examine the EU's cost-optimal timeline to net zero by 2050, using seven models
- The bloc should phase out unabated coal and decarbonize its power sector by 2040

Figure 17. Preview of 'A multi-model analysis of the EU's path to net zero' in Joule

2.18 Svarstad et al. (2023), Nature Climate Change

Title:	Critical climate education is crucial for fast and just transformations
Authors:	Hanne Svarstad, Alfredo Jornet, Glen P. Peters (CICERO), Tom G. Griffiths, Tor A. Benjaminsen
Journal:	Nature Climate Change
Abstract:	If rapid and just transformations to low-carbon societies are to take place, citizens need to obtain the necessary knowledge and skills to critically examine and choose adequate climate policy options. An emphasis on critical climate education research and implementation is therefore required.
Keywords:	Climate education; just transformation
DOI:	https://doi.org/10.1038/s41558-023-01875-2
First Online:	4 December 2023
Repository:	Zenodo (Link: https://zenodo.org/records/10303921)
Synergies with:	N/A
Citation (APA):	Svarstad, H., Jornet, A., Peters, G. P., Griffiths, T. G., & Benjaminsen, T. A. (2023). Critical climate education is crucial for fast and just transformations. <i>Nature Climate Change</i> , 13(12), 1274-1275.

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Critical climate education is crucial for fast and just transformations

[Hanne Svarstad](#) , [Alfredo Jornet](#), [Glen P. Peters](#), [Tom G. Griffiths](#) & [Tor A. Benjaminsen](#)

Nature Climate Change **13**, 1274–1275 (2023) | [Cite this article](#)

678 Accesses | 53 Altmetric | [Metrics](#)

If rapid and just transformations to low-carbon societies are to take place, citizens need to obtain the necessary knowledge and skills to critically examine and choose adequate climate policy options. An emphasis on critical climate education research and implementation is therefore required.

Climate mitigation is evolving too slowly compared with the pledges and ambitions to limit global warming to “well below 2.0 °C”¹. A range of climate mitigation strategies have been

Figure 18. Preview of ‘Critical climate education is crucial for fast and just transformations’ in Nature Climate Change

2.19 Nikas et al. (2024), Renewable and Sustainable Energy Transition

Title:	Promoting sustainable transitions across the globe requires scenario co-creation with key stakeholders
Authors:	Alexandros Nikas, Ajay Gambhir, Baptise Bitier
Journal:	Renewable and Sustainable Energy Transition
Abstract:	The Paris Agreement rests on individual countries and regions identifying stretching but feasible mitigation pathways. These must be acceptable and achievable in the eyes of a range of stakeholders in those countries or regions, including those from civil society, governments, and businesses. This Special Issue explores a range of feasible yet ambitious greenhouse gas emissions reduction pathways in a diversity of regions/countries of the world, in principle compatible with the goals of the Paris Agreement on climate change. Each of these pathways have been developed using energy system models or whole-economy models, in most cases using mitigation scenarios co-created with a range of policy, civil society, academic, and business stakeholders.
Keywords:	Stakeholders; co-creation; sustainability
DOI:	https://doi.org/10.1016/j.rset.2023.100076
First Online:	27 December 2023
Repository:	Zenodo (Link: https://zenodo.org/records/10518689)
Synergies with:	HE DIAMOND (GA: 101081179), H2020 PARIS REINFORCE (GA: 820846)
Citation (APA):	Nikas, A., Gambhir, A., & Boitier, B. (2023). Promoting sustainable transitions across the globe requires scenario co-creation with key stakeholders. Renewable and Sustainable Energy Transition, in press.



Renewable and Sustainable Energy Transition

Available online 27 December 2023, 100076

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Promoting sustainable transitions across the globe requires scenario co-creation with key stakeholders

[Alexandros Nikas](#)^a  [Ajay Gambhir](#)^b, [Baptiste Boitier](#)^c[Show more](#) [+](#) Add to Mendeley [↻](#) Share [🗨](#) Cite<https://doi.org/10.1016/j.rset.2023.100076>[Get rights and content](#)

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The Paris Agreement rests on individual countries and regions identifying stretching but feasible mitigation pathways. These must be acceptable and achievable in the eyes of a range of stakeholders in those countries or regions, including those from civil society, governments, and businesses. This Special Issue explores a range of feasible yet ambitious greenhouse gas emissions reduction pathways in a diversity of regions/ countries of the world, in principle compatible with the goals of the Paris Agreement on climate change. Each of these pathways have been developed using energy system models or whole-economy models, in most cases using mitigation scenarios co-created with a range of policy, civil society, academic, and business stakeholders.

Figure 19. Preview of 'Promoting sustainable transitions across the globe requires scenario co-creation with key stakeholders' in Renewable and Sustainable Energy Transitions

2.20 Nikas et al. (2024), Energy

Title:	Three different directions in which the European Union could replace Russian natural gas
Authors:	Alexandros Nikas, Natasha Frilingou, Conall Heussaff, Panagiotis Fragkos, Shivika Mittal, Jon Sampedro, Sara Giarola, Jan-Philipp Sasse, Lorenzo Rinaldi, Haris Doukas, Ajay Gambhir, Anastasis Giannousakis, Nicolò Golinucci, Konstantinos Koasidis, Matteo Vincenzo Rocco, Evelina Trutnevyte, Georgios Xexakis, Georg Zachmann, Eleftheria Zisarou, Emanuela Colombo, Adam Hawkes, Brinda Yarlagadda, Matthew Binsted, Gokul Iyer, Rasmus Magni Johannsen, Jakob Zinck Thellufsen, Henrik Lund, Dirk-Jan Van de Ven, Alexandros Nikas, Ajay Gambhir, Baptise Bitier
Journal:	Energy
Abstract:	Russia's invasion of Ukraine fuelled an energy crisis, which considerably impacted Europe given its heavy reliance on Russian natural gas imports. This study uses an ensemble of four global integrated assessment models, which are further soft-linked to two sectoral models, and explores the synergies and trade-offs among three approaches to living without Russian gas in Europe: (a) replacing with other gas imports, (b) boosting domestic energy production, and (c) reducing demand and accelerating energy efficiency. We find that substituting Russian gas from other trade partners would miss an opportunity to accelerate decarbonisation in end-use sectors while risking further fossil-fuel lock-ins, despite featuring the lowest gas price spikes and potentially reducing heating costs for end-users in the near term. Boosting domestic, primarily renewable, energy production on the other hand would instead require considerable investments, potentially burdening consumers. Energy demand reductions, however, could offer considerable space for further emissions cuts at the lowest power-sector investment costs; nonetheless, an energy efficiency-driven strategy would also risk relocation of energy-intensive industries, an aspect of increasing relevance to EU policymakers.
Keywords:	Stakeholders; co-creation; sustainability
DOI:	https://doi.org/10.1016/j.energy.2024.130254
First Online:	04 January 2024
Repository:	Zenodo (Link: https://zenodo.org/records/10464723)
Synergies with:	HE DIAMOND (GA: 101081179), MANET (GA: 101033173), H2020 NDC ASPECTS (GA: 101003866)
Citation (APA):	Nikas, A., Frilingou, N., Heussauf, C., Fragkos, P., Mittal, S., Sampedro, J., Giarola, S., Sasse, J.-P., Rinaldi, L., Doukas, H., Gambhir, A., Giannousakis, A., Gollinucci, N., Koasidis, K., Rocco, M.V., Trutnevyte, E., Xexakis, G., Zachmann, G., Zisarou, E., Colombo, E., Hawkes, A., Yarlagadda, B., Binsted, M., Iyer, G., Johannsen, R.M., Thellufsen, J.Z., Lund, H., & Van de Ven, D.-J. (2024). Three different directions in which the European Union could replace Russian natural gas. <i>Energy</i> , 290, 130254.



Energy
Volume 290, 1 March 2024, 130254



Three different directions in which the European Union could replace Russian natural gas

Alexandros Nikas^a, , , [Natasha Frilingou^a](#), [Conall Heussaff^b](#), [Panagiotis Fragkos^c](#), [Shivika Mittal^d](#), [Jon Sampedro^e](#), [Sara Giarola^f](#), [Jan-Philipp Sasse^g](#), [Lorenzo Rinaldi^h](#), [Haris Doukas^a](#), [Ajay Gambhir^d](#), [Anastasis Giannousakis^c](#), [Nicolò Golinucci^h](#), [Konstantinos Koasidis^a](#), [Matteo Vincenzo Rocco^h](#), [Evelina Trutnevite^g](#), [Georgios Xexakisⁱ](#), [Georg Zachmann^b](#), [Eleftheria Zisarou^c](#), [Emanuela Colombo^h](#)...[Dirk-Jan Van de Ven^e](#)

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Highlights

- Three 'corner' strategies to replacing Russian natural gas in the EU are explored.
- EU climate targets can still be reached in all three strategies, but costs increase.
- Promoting energy efficiency or domestic renewables can boost end-use decarbonisation.
- An 'energy efficiency first' response may save millions € in annual electricity costs.
- Southern Europe is the most vulnerable to high electricity prices across strategies.

Figure 20. Preview of 'Three different directions in which the European Union could replace Russian natural gas' in Energy

2.21 McGookin et al. (2024), Energy Strategy Reviews

Title:	Advancing participatory energy systems modelling
Authors:	Connor McGookin, Diana Süsser, Georgios Xexakis, Evelina Trutnevyte, Will McDowall, Alexandros Nikas, Konstantinos Koasidis, Sheridan Few, Per Dannemand Andersen, Christina Demski, Patrícia Fortes, Sofia G. Simoes, Christopher Bishop, Fionn Rogan, Brian Ó Gallachóir
Journal:	Energy Strategy Reviews
Abstract:	Energy system models are important tools to guide our understanding of current and future carbon dioxide emissions as well as to inform strategies for emissions reduction. These models offer a vital evidence base that increasingly underpins energy and climate policies in many countries. In light of this important role in policy formation, there is growing interest in, and demands for, energy modellers to integrate more diverse perspectives on possible and preferred futures into the modelling process. The main purpose of this is to ensure that the resultant policy decisions are both fairer and better reflect people's concerns and preferences. However, while there has been a focus in the literature on efforts to bring societal dimensions into modelling tools, there remains a limited number of examples of well-structured participatory energy systems modelling processes and no available how-to guidance. This paper addresses this gap by providing good practice guidance for integrating stakeholder and public involvement in energy systems modelling based on the reflections of a diverse range of experts from this emergent field. The framework outlined in this paper offers multiple entry points for modellers to incorporate participatory elements either throughout the process or in individual stages. Recognising the messiness of both fields (energy systems modelling and participatory research), the good practice principles are not comprehensive or set in stone, but rather pose important questions to steer this process. Finally, the reflections on key issues provide a summary of the crucial challenges and important areas for future research in this critical field.
Keywords:	
DOI:	https://doi.org/10.1016/j.esr.2024.101319
First Online:	02 February 2024
Repository:	Zenodo (Link:)
Synergies with:	HE DIAMOND (GA: 101081179), H2020 ENCLUDE (GA: 101022791), JUSTEM (GA: 101076151), H2020 PARIS REINFORCE (GA: 820846)
Citation (APA):	McGookin, C., Süsser, D., Xexakis, G., Trutnevyte, E., McDowall, W., Nikas, A., Koasidis, K., Few, S., Andersen, P. D., Demski, C., Fortes, P., Simoes, S. G., Bishop, C., Rogan, F., & Ó Gallachóir, B. (2024). Advancing participatory energy systems modelling. <i>Energy Strategy Reviews</i> , 52, 101319.

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Energy Strategy Reviews

Volume 52, March 2024, 101319



Advancing participatory energy systems modelling

Connor McGookin ^{a, b, c}, Diana Süßer ^d, Georgios Xexakis ^e, Evelina Trutnevte ^f,
Will McDowall ^g, Alexandros Nikas ^h, Konstantinos Koasidis ^h, Sheridan Few ⁱ,
Per Dannemand Andersen ^j, Christina Demski ^k, Patrícia Fortes ^l, Sofia G. Simoes ^m,
Christopher Bishop ^a, Fionn Rogan ^{a, b}, Brian Ó Gallachóir ^{a, b}

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Highlights

- A framework for participatory energy system modelling was developed.
- Different entry points are outlined for modellers to integrate participatory approaches.
- Good practice principles are provided to help navigate this process.
- Critical reflections on the key issues within this emergent field offer important areas for future research.

Figure 21. Preview of 'Advancing participatory energy systems modelling' in Energy Strategy Reviews

2.22 Al Khourdajie et al. (2024), Energy and Climate Change

Title:	Climate ambition, background scenario or the model? Attribution of the variance of energy-related indicators in global scenarios
Authors:	Alaa Al Khourdajie, Jim Skea, Richard Green
Journal:	Energy and Climate Change
Abstract:	We attribute variations in key energy sector indicators across global climate mitigation scenarios to climate ambition, assumptions in background socioeconomic scenarios, differences between models and an unattributed portion that depends on the interaction between these. The scenarios assessed have been generated by Integrated Assessment Models (IAMs) as part of a model intercomparison project exploring the Shared Socio-economic Pathways (SSPs) used by the climate science community. Climate ambition plays the most significant role in explaining many energy-related indicators, particularly those relevant to overall energy supply, the use of fossil fuels, final energy carriers and emissions. The role of socioeconomic background scenarios is more prominent for indicators influenced by population and GDP growth, such as those relating to final energy demand and nuclear energy. Variations across some indicators, including hydro, solar and wind generation, are largely attributable to inter-model differences. Our Shapley–Owen decomposition gives an unexplained residual not due to the average effects of the other factors, highlighting some indicators (such as the use of carbon capture and storage (CCS) for fossil fuels, or adopting hydrogen as an energy carrier) with outlier results for particular ambition-scenario-model combinations. This suggests guidance to policymakers on these indicators is the least robust.
Keywords:	Energy transition, Climate change mitigation, Integrated assessment models, Shapley–Owen decomposition
DOI:	https://doi.org/10.1016/j.egycc.2024.100126
First Online:	22 January 2024
Repository:	Zenodo (Link:)
Synergies with:	N/A
Citation (APA):	Al Khourdajie, A., Skea, J., & Green, R. (2024). Climate ambition, background scenario or the model? Attribution of the variance of energy-related indicators in global scenarios. <i>Energy and Climate Change</i> , 100126.



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Energy and Climate Change

Volume 5, December 2024, 100126



Full Length Article

Climate ambition, background scenario or the model? Attribution of the variance of energy-related indicators in global scenarios

Alaa Al Khourdajie ^{a, b}, Jim Skea ^c, Richard Green ^d[Show more](#) ✓

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Highlights

- We attribute variation across global climate mitigation scenarios to three factors.
- The three factors are climate ambition, scenario background and model choice.
- Many indicators are well-explained by the average effects of one or two factors.
- We also calculate the residual not explained by these average effects.
- This shows which indicators give outliers for some specific input combinations.

Figure 22. Preview of 'Climate ambition, background scenario or the model? Attribution of the variance of energy-related indicators in global scenarios' in Energy and Climate Change

2.23 Minx et al. (2024), Environmental Research Letters

Title:	Coal transitions—part 2: phase-out dynamics in global long-term mitigation scenarios
Authors:	Jan C Minx, Jerome Hilaire, Finn Müller-Hansen, Gregory Nemet, Francesca Diluiso, Robbie M Andrew, Ceren Ayas, Nico Bauer, Stephen L Bi, Leon Clarke, Felix Creutzig, Ryna Yiyun Cui, Frank Jotzo, Matthias Kalkuhl, William F Lamb, Andreas Löschel, Niccolò Manych, Malte Meinshausen, Pao-Yu Oei, Glen P Peters, Benjamin Sovacool, Jan C Steckel, Sebastian Thomas, Annabelle Workman, John Wiseman
Journal:	Environmental Research Letters
Abstract:	A rapid phase-out of unabated coal use is essential to limit global warming to below 2 °C. This review presents a comprehensive assessment of coal transitions in mitigation scenarios consistent with the Paris Agreement, using data from more than 1500 publicly available scenarios generated by more than 30 integrated assessment models. Our ensemble analysis uses clustering techniques to categorize coal transition pathways in models and bridges evidence on technological learning and innovation with historical data of energy systems. Six key findings emerge: First, we identify three archetypal coal transitions within Paris-consistent mitigation pathways. About 38% of scenarios are 'coal phase out' trajectories and rapidly reduce coal consumption to near zero. 'Coal persistence' pathways (42%) reduce coal consumption much more gradually and incompletely. The remaining 20% follow 'coal resurgence' pathways, characterized by increased coal consumption in the second half of the century. Second, coal persistence and resurgence archetypes rely on the widespread availability and rapid scale-up of carbon capture and storage technology (CCS). Third, coal-transition archetypes spread across all levels of climate policy ambition and scenario cycles, reflecting their dependence on model structures and assumptions. Fourth, most baseline scenarios—including the shared socio-economic pathways (SSPs)—show much higher coal dependency compared to historical observations over the last 60 years. Fifth, coal-transition scenarios consistently incorporate very optimistic assumptions about the cost and scalability of CCS technologies, while being pessimistic about the cost and scalability of renewable energy technologies. Sixth, evaluation against coal-dependent baseline scenarios suggests that many mitigation scenarios overestimate the technical difficulty and costs of coal phase-outs. To improve future research, we recommend using up-to-date cost data and evidence about innovation and diffusion dynamics of different groups of zero or low-carbon technologies. Revised SSP quantifications need to incorporate projected technology learning and consistent cost structures, while reflecting recent trends in coal consumption.
Keywords:	
DOI:	https://doi.org/10.1088/1748-9326/ad24cd
First Online:	05 March 2024
Repository:	Zenodo (Link: https://zenodo.org/records/11058940)
Synergies with:	H2020 GENIE (GA: 951542), HE RESCUE (GA: 101056939)
Citation (APA):	Minx, J. C., Hilaire, J., Müller-Hansen, F., Nemet, G., Diluiso, F., Andrew, R. M., Ayas, C., Bauer, N., Bi, S. L., Clarke, L., Creutzig, F., Cui, R. Y., Jotzo, F., Kalkuhl, M., Lamb, W. F., Löschel, A., Manych, N., Meinshausen, M., Oei, P. Y., ... Wiseman, J. (2024). Coal transitions—part 2: phase-out dynamics in global long-term mitigation scenarios.

Environmental Research Letters, 19(3), 033002.



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TOPICAL REVIEW • OPEN ACCESS

Coal transitions—part 2: phase-out dynamics in global long-term mitigation scenarios

Jan C Minx, Jerome Hilaire, Finn Müller-Hansen, Gregory Nemet, Francesca Diluiso, Robbie M Andrew, Ceren Ayas, Nico Bauer, Stephen L Bi, Leon Clarke [Show full author list](#)

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Abstract

A rapid phase-out of unabated coal use is essential to limit global warming to below 2 °C. This review presents a comprehensive assessment of coal transitions in mitigation scenarios consistent with the Paris Agreement, using data from more than 1500 publicly available scenarios generated by more than 30 integrated assessment models. Our ensemble analysis uses clustering techniques to categorize coal transition pathways in models and bridges evidence on technological learning and innovation with historical data of energy systems. Six key findings emerge: First, we identify three archetypal coal transitions within Paris-consistent mitigation pathways. About 38% of scenarios are 'coal phase out' trajectories and rapidly reduce coal consumption to near zero. 'Coal persistence' pathways (42%) reduce coal consumption much more gradually and incompletely. The remaining 20% follow 'coal resurgence' pathways, characterized by increased coal consumption in the second half of the century. Second, coal persistence and resurgence archetypes rely on the widespread availability and rapid scale-up of carbon capture and storage technology (CCS). Third, coal-transition archetypes spread across all levels of climate policy ambition and scenario cycles, reflecting their dependence on model structures

Figure 23. Preview of 'Coal transitions—part 2: phase-out dynamics in global long-term mitigation scenarios' in Environmental Research Letters

2.24 Moreno et al. (2024), Communications Earth & Environment

Title:	The impacts of decarbonization pathways on Sustainable Development Goals in the European Union
Authors:	Jorge Moreno, Lorenza Campagnolo, Baptiste Boitier, Alexandros Nikas, Konstantinos Koasidis, Ajay Gambhir, Mikel Gonzalez-Eguino, Sigit Perdana, Dirk-Jan Van de Ven, Alessandro Chiodi, Elisa Delpiazzi, Haris Doukas, Maurizio Gargiulo, Andrea Herbst, Khaled Al-Dabbas, Şirin Alibaş, Felix Neuner, Pierre Le Mouël, Marc Vielle
Journal:	Communications Earth & Environment
Abstract:	Climate action to achieve the Paris Agreement should respect the United Nations Sustainable Development Goals. Here, we use an integrated assessment modelling framework comprising nine climate policy models and quantify the impacts of decarbonisation pathways on Sustainable Development Goals in the European Union at regional and national levels. We show that scenario-consistent assumptions of future socio-economic trends and current climate policies would improve energy- and carbon-related aspects of sustainability and reduce inequalities. Ambitious net-zero emissions pathways would further improve health and agricultural productivity. Furthermore, countries currently lagging in achieving sustainable development goals would see the greatest benefits from ambitious climate action. Negative socio-economic impacts from climate action on poverty, hunger, and economic growth will require specific corrective policies. While our analysis does not quantify the negative effects of less ambitious climate policy, it demonstrates where co-benefits and trade-offs of greenhouse gas mitigation and sustainable development agenda exist and can guide policy formulation.
Keywords:	Climate-change mitigation, Environmental impact, Projection and prediction
DOI:	https://doi.org/10.1038/s43247-024-01309-7
First Online:	16 March 2024
Repository:	Zenodo (Link: https://zenodo.org/records/10863386)
Synergies with:	HE DIAMOND (GA: 101081179), H2020 PARIS REINFORCE (GA: 820846)
Citation (APA):	Moreno, J., Campagnolo, L., Boitier, B., Nikas, A., Koasidis, K., Gambhir, A., ... & Vielle, M. (2024). The impacts of decarbonization pathways on Sustainable Development Goals in the European Union. <i>Communications Earth & Environment</i> , 5(1), 136.

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The impacts of decarbonization pathways on Sustainable Development Goals in the European Union

[Jorge Moreno](#), [Lorenza Campagnolo](#), [Baptiste Boitier](#), [Alexandros Nikas](#) , [Konstantinos Koasidis](#), [Ajay Gambhir](#), [Mikel Gonzalez-Eguino](#), [Sigit Perdana](#), [Dirk-Jan Van de Ven](#), [Alessandro Chiodi](#), [Elisa Delpiazzo](#), [Haris Doukas](#), [Maurizio Gargiulo](#), [Andrea Herbst](#), [Khaled Al-Dabbas](#), [Şirin Alibaş](#), [Felix Neuner](#), [Pierre Le Mouél](#) & [Marc Vielle](#)

Communications Earth & Environment 5, Article number: 136 (2024) | [Cite this article](#)

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Abstract

Climate action to achieve the Paris Agreement should respect the United Nations Sustainable Development Goals. Here, we use an integrated assessment modelling framework comprising nine climate policy models and quantify the impacts of decarbonisation pathways on Sustainable Development Goals in the European Union at regional and national levels. We show that scenario-consistent assumptions of future socio-economic trends and current climate policies would improve energy- and carbon-related aspects of sustainability and reduce inequalities. Ambitious net-zero emissions pathways would further improve health and agricultural productivity. Furthermore, countries currently lagging in achieving sustainable development goals would see the greatest benefits from ambitious climate action. Negative socio-economic impacts from climate action on poverty, hunger, and economic growth will require specific corrective policies. While our analysis does not quantify the negative effects of less ambitious climate policy, it demonstrates where co-benefits and trade-offs of greenhouse gas mitigation and sustainable development agenda exist and can guide policy formulation.

Figure 24. Preview of 'The impacts of decarbonization pathways on Sustainable Development Goals in the European Union' in Communications Earth & Environment

2.25 Rodés-Bachs et al. (2024), Journal of Open Source Software

Title:	gcamreport: An R tool to process and standardize GCAM outputs
Authors:	Clàudia Rodés-Bachs, Jon Sampedro, Russell Horowitz, Dirk-Jan Van de Ven, Ryna Yiyun Cui, Alicia Zhao, Matthew Zwerling, Zarrar Khan
Journal:	Journal of Open Source Software
Abstract:	There is an urgent need for multi-model studies to characterize uncertainty arising from model heterogeneity. These studies aim to build a more reliable and transparent framework, informing policymakers in the design and implementation of climate policies (Guivarch et al., 2022). In response to this challenge, multiple institutes and organizations have adopted the standardized data template developed by the Integrated Assessment Modeling Consortium (IAMC). This template is maintained by the International Institute for Applied Systems Analysis (IIASA) and aims to standardize and facilitate model intercomparison exercises. For the latest Assessment Report (AR6), the Intergovernmental Panel on Climate Change (IPCC) required all contributors to homogenize their data to enable comparisons and ensure full transparency (V. Krey et al., 2014). This practice has set the foundation for a new open management of the outputs in the area of global scenario analysis. In the case of the Global Change Analysis Model (GCAM) (Calvin et al., 2019), a well-regarded model that has been extensively used for different international and national scenario analysis, the harmonization code has never been documented nor standardized, making it difficult to reproduce outputs and hindering the transparency of results. To overcome these limitations, we have developed gcamreport, an R package that systematizes the transformations of GCAM outputs, generates figures to facilitate the analysis of the results, and allows user interaction with the produced outputs. Furthermore, the tool can be used embedded in a Docker image, which allows users to use the package in a virtual environment without having to install any specific software or library. Finally, each gcamreport release is linked to either a version of GCAM or a study in which GCAM was used, ensuring reproducibility, interoperability, accessibility, and findability, which is in line with the well-known open science principles FAIR and TRUST (Lin et al., 2020; Wilkinson et al., 2016).
Keywords:	analysis, IAMC, GCAM
DOI:	https://doi.org/10.21105/joss.05975
First Online:	22 April 2024
Repository:	Zenodo (Link: https://zenodo.org/records/11060443)
Synergies with:	N/A
Citation (APA):	Rodés-Bachs, C., Sampedro, J., Horowitz, R., Ven, D.-J. van de, Cui, R. Y., Zhao, A., Zwerling, M., & Khan, Z. (2024). gcamreport: An R tool to process and standardize GCAM outputs. <i>Journal of Open Source Software</i> , 9(96), 5975.

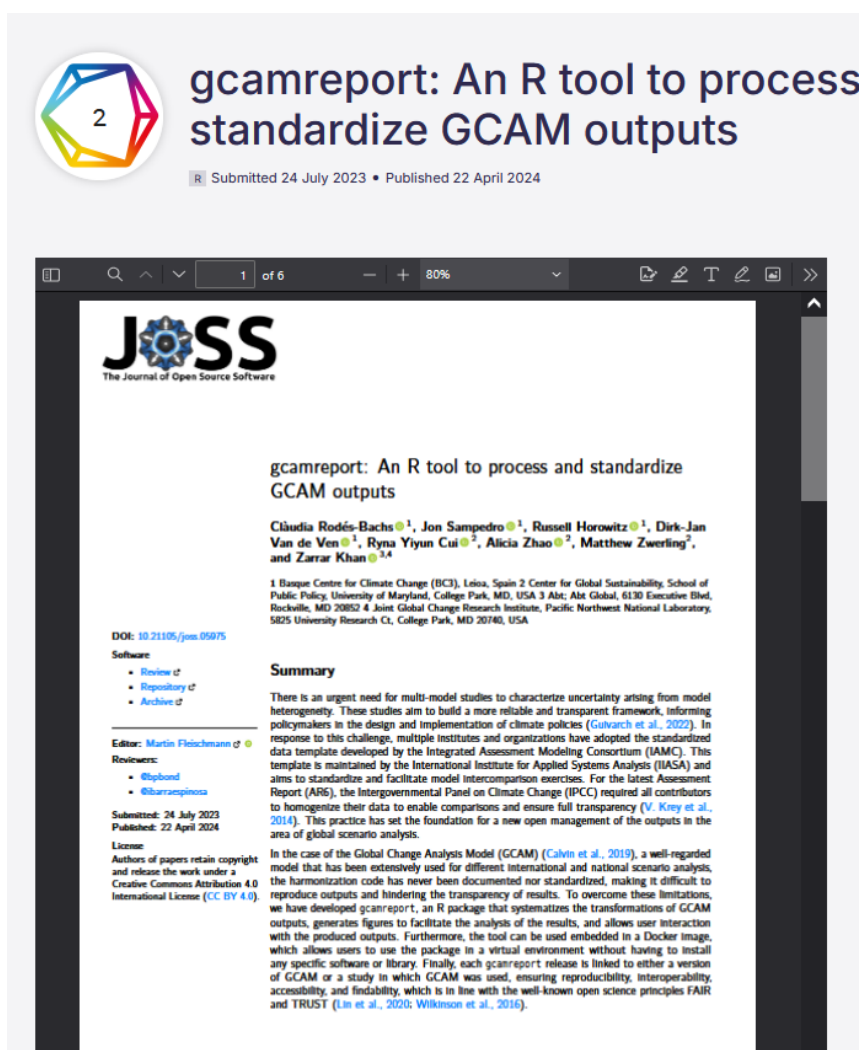


Figure 25. Preview of 'gcamreport: An R tool to process and standardize GCAM outputs' in Journal of Open Source Software

2.26 Beath et al. (2024), Nature Communications

Title:	Carbon pricing and system reliability impacts on pathways to universal electricity access in Africa
Authors:	Hamish Beath, Shivika Mittal, Sheridan Few, Benedict Winchester, Philip Sandwell, Christos N. Markides, Jenny Nelson, Ajay Gambhir
Journal:	Nature Communications
Abstract:	Off-grid photovoltaic systems have been proposed as a panacea for economies with poor electricity access, offering a lower-cost “leapfrog” over grid infrastructure used in higher-income economies. Previous research examining pathways to electricity access may understate the role of off-grid photovoltaics as it has not considered reliability and carbon pricing impacts. We perform high-resolution geospatial analysis on universal household electricity access in Sub-Saharan Africa that includes these aspects via least-cost pathways at different electricity demand levels. Under our “Tier 3” demand reference scenario, 24% of our study’s 470 million people obtaining electricity access by 2030 do so via off-grid photovoltaics. Including a unit cost for unmet demand of 0.50 US dollars (\$)/kWh, to penalise poor system reliability increases this share to 41%. Applying a carbon price (around \$80/tonne CO ₂ -eq) increases it to 38%. Our results indicate considerable diversity in the level of policy intervention needed between countries and suggest several regions where lower levels of policy intervention may be effective.
Keywords:	Climate-change policy, Energy access, Energy grids and networks
DOI:	https://doi.org/10.1038/s41467-024-48450-7
First Online:	16 May 2024
Repository:	Zenodo (Link:)
Synergies with:	ATIP, RENG, SUNRISE
Citation (APA):	Beath, H., Mittal, S., Few, S., Winchester, B., Sandwell, P., Markides, C. N., ... & Gambhir, A. (2024). Carbon pricing and system reliability impacts on pathways to universal electricity access in Africa. <i>Nature Communications</i> , 15(1), 4172.

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[Explore content](#) ▾ [About the journal](#) ▾ [Publish with us](#) ▾[nature](#) > [nature communications](#) > [articles](#) > [article](#)Article | [Open access](#) | Published: 16 May 2024**Carbon pricing and system reliability impacts on pathways to universal electricity access in Africa**[Hamish Beath](#) , [Shivika Mittal](#), [Sheridan Few](#), [Benedict Winchester](#), [Philip Sandwell](#), [Christos N. Markides](#), [Jenny Nelson](#) & [Ajay Gambhir](#)[Nature Communications](#) **15**, Article number: 4172 (2024) | [Cite this article](#)5820 Accesses | 1 Citations | 108 Altmetric | [Metrics](#)**Abstract**

Off-grid photovoltaic systems have been proposed as a panacea for economies with poor electricity access, offering a lower-cost “leapfrog” over grid infrastructure used in higher-income economies. Previous research examining pathways to electricity access may understate the role of off-grid photovoltaics as it has not considered reliability and carbon pricing impacts. We perform high-resolution geospatial analysis on universal household electricity access in Sub-Saharan Africa that includes these aspects via least-cost pathways at different electricity demand levels. Under our “Tier 3” demand reference scenario, 24% of our study’s 470 million people obtaining electricity access by 2030 do so via off-grid photovoltaics. Including a unit cost for unmet demand of 0.50 US dollars (\$)/kWh, to penalise poor system reliability increases this share to 41%. Applying a carbon price (around \$80/tonne CO₂-eq) increases it to 38%. Our results indicate considerable diversity in the level of policy intervention needed between countries and suggest several regions where lower levels of policy intervention may be effective.

Figure 26. Preview of ‘Carbon pricing and system reliability impacts on pathways to universal electricity access in Africa’ in Nature Communications

2.27 Meinshausen et al. (2024), Geoscientific Model Development

Title:	A perspective on the next generation of Earth system model scenarios: towards representative emission pathways (REPs)
Authors:	Malte Meinshausen, Carl-Friedrich Schleussner, Kathleen Beyer, Greg Bodeker, Olivier Boucher, Josep G. Canadell, John S. Daniel, Aïda Diongue-Niang, Fatima Driouech, Erich Fischer, Piers Forster, Michael Grose, Gerrit Hansen, Zeke Hausfather, Tatiana Ilyina, Jarmo S. Kikstra, Joyce Kimutai, Andrew D. King, June-Yi Lee, Chris Lennard, Tabea Lissner, Alexander Nauels, Glen P. Peters, Anna Pirani, Gian-Kasper Plattner, Hans Pörtner, Joeri Rogelj, Maisa Rojas, Joyashree Roy, Bjørn H. Samset, Benjamin M. Sanderson, Roland Séférian, Sonia Seneviratne, Christopher J. Smith, Sophie Szopa, Adelle Thomas, Diana Urge-Vorsatz, Guus J. M. Velde, Tokuta Yokohata, Tilo Ziehn, Zebedee Nicholls
Journal:	Geoscientific Model Development
Abstract:	In every Intergovernmental Panel on Climate Change (IPCC) Assessment cycle, a multitude of scenarios are assessed, with different scope and emphasis throughout the various Working Group reports and special reports, as well as their respective chapters. Within the reports, the ambition is to integrate knowledge on possible climate futures across the Working Groups and scientific research domains based on a small set of “framing pathways” such as the so-called representative concentration pathways (RCPs) in the Fifth IPCC Assessment Report (AR5) and the shared socioeconomic pathway (SSP) scenarios in the Sixth Assessment Report (AR6). This perspective, initiated by discussions at the IPCC Bangkok workshop in April 2023 on the “Use of Scenarios in AR6 and Subsequent Assessments”, is intended to serve as one of the community contributions to highlight the needs for the next generation of framing pathways that is being advanced under the Coupled Model Intercomparison Project (CMIP) umbrella, which will influence or even predicate the IPCC AR7 consideration of framing pathways. Here we suggest several policy research objectives that such a set of framing pathways should ideally fulfil, including mitigation needs for meeting the Paris Agreement objectives, the risks associated with carbon removal strategies, the consequences of delay in enacting that mitigation, guidance for adaptation needs, loss and damage, and for achieving mitigation in the wider context of societal development goals. Based on this context, we suggest that the next generation of climate scenarios for Earth system models should evolve towards representative emission pathways (REPs) and suggest key categories for such pathways. These framing pathways should address the most critical mitigation policy and adaptation plans that need to be implemented over the next 10 years. In our view, the most important categories are those relevant in the context of the Paris Agreement long-term goal, specifically an immediate action (low overshoot) 1.5 °C pathway and a delayed action (high overshoot) 1.5 °C pathway. Two other key categories are a pathway category approximately in line with current (as expressed by 2023) near- and long-term policy objectives, as well as a higher-emission category that is approximately in line with “current policies” (as expressed by 2023). We also argue for the scientific and policy relevance in exploring two “worlds that could have been”. One of these categories has high-emission trajectories well above what is implied by current policies and the other has very-low-emission trajectories which assume that global mitigation action in line with limiting warming to 1.5 °C without overshoot had begun in 2015. Finally, we note that the timely provision of new scientific information on pathways is critical to inform the development and implementation of climate policy. Under the Paris Agreement, for the second global stocktake, which will occur in 2028, and to inform subsequent development of nationally determined contributions (NDCs) up to 2040, scientific inputs are required by

2027. These needs should be carefully considered in the development timeline of community modelling activities, including those under CMIP7.

Keywords:**DOI:** <https://doi.org/10.5194/gmd-17-4533-2024>**First Online:** 05 Jun 2024**Repository:** Zenodo (Link: <https://zenodo.org/records/13692230>)**Synergies with:** H2020 4C (GA: 82100360), H2020 PROVIDE (GA: 101003687)

Citation (APA): Meinshausen, M., Schleussner, C.-F., Beyer, K., Bodeker, G., Boucher, O., Canadell, J. G., Daniel, J. S., Diongue-Niang, A., Driouech, F., Fischer, E., Forster, P., Grose, M., Hansen, G., Hausfather, Z., Ilyina, T., Kikstra, J. S., Kimutai, J., King, A. D., Lee, J.-Y., Lennard, C., Lissner, T., Nauels, A., Peters, G. P., Pirani, A., Plattner, G.-K., Pörtner, H., Rogelj, J., Rojas, M., Roy, J., Samset, B. H., Sanderson, B. M., Séférian, R., Seneviratne, S., Smith, C. J., Szopa, S., Thomas, A., Urge-Vorsatz, D., Velders, G. J. M., Yokohata, T., Ziehn, T., and Nicholls, Z. (2024). A perspective on the next generation of Earth system model scenarios: towards representative emission pathways (REPs), *Geoscientific Model Development Discussions*, 17, 4533–4559.

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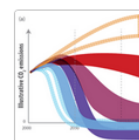
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A perspective on the next generation of Earth system model scenarios: towards representative emission pathways (REPs)



Malte Meinshausen , Carl-Friedrich Schleussner , Kathleen Beyer, Greg Bodeker, Olivier Boucher, Josep G. Canadell, John S. Daniel, Aida Diongue-Niang, Fatima Driouech, Erich Fischer, Piers Forster, Michael Grose, Gerrit Hansen, Zeke Hausfather, Tatiana Ilyina, Jarmo S. Kikstra, Joyce Kimutai, Andrew D. King, June-Yi Lee, Chris Lennard, Tabea Lissner, Alexander Nauels, Glen P. Peters, Anna Pirani, Gian-Kasper Plattner, Hans Pörtner, Joeri Rogelj, Maisa Rojas, Joyashree Roy, Bjørn H. Samset, Benjamin M. Sanderson, Roland Séférian, Sonia Seneviratne, Christopher J. Smith, Sophie Szopa, Adelle Thomas, Diana Urge-Vorsatz, Guus J. M. Velders, Tokuta Yokohata, Tilo Ziehn, and Zebedee Nicholls

Abstract

In every Intergovernmental Panel on Climate Change (IPCC) Assessment cycle, a multitude of scenarios are assessed, with different scope and emphasis throughout the various Working Group reports and special reports, as well as their respective chapters. Within the reports, the ambition is to integrate knowledge on possible climate futures across the Working Groups and scientific research domains based on a small set of “framing pathways” such as the so-called representative concentration pathways (RCPs) in the Fifth IPCC Assessment Report (AR5) and the shared socioeconomic pathway (SSP) scenarios in the Sixth Assessment Report (AR6). This perspective, initiated by discussions at the IPCC Bangkok workshop in April 2023 on the “Use of Scenarios in AR6 and Subsequent Assessments”, is intended to serve as one of the community contributions to highlight the needs for the next generation of framing pathways that is being advanced under the Coupled Model Intercomparison Project (CMIP) umbrella, which will influence or even predicate the IPCC AR7 consideration of framing pathways. Here we suggest several policy research objectives that such a set of framing pathways should ideally fulfil, including mitigation needs for meeting the Paris Agreement objectives, the risks associated with carbon removal strategies, the consequences of delay in enacting that mitigation, guidance for adaptation needs, loss and damage, and for achieving mitigation in the wider context of societal development goals. Based on this context, we suggest that the next generation of climate scenarios for Earth system models should evolve towards representative emission pathways (REPs) and suggest key categories for such pathways. These framing pathways should address the most critical mitigation policy and adaptation plans that need to be implemented over the next 10 years. In our view, the most important categories are those relevant in the context of the Paris Agreement long-term goal, specifically an immediate action (low

Figure 27. Preview of ‘A perspective on the next generation of Earth system model scenarios: towards representative emission pathways (REPs)’ in Geoscientific Model Development

2.28 Sampedro et al. (2024), Energy Strategy Reviews

Title:	Energy system analysis of cutting off Russian gas supply to the European Union
Authors:	Jon Sampedro, Dirk-Jan Van de Ven, Russell Horowitz, Clàudia Rodés-Bachs, Natasha Frilingou, Alexandros Nikas, Matthew Binsted, Gokul Iyer, Brinda Yarlagadda
Journal:	Energy Strategy Reviews
Abstract:	The reduction of the EU's pipeline gas imports from Russia because of the Russian war against Ukraine has had severe economy-wide implications for the bloc. Using a multisector integrated assessment model (GCAM), we find that a potential complete cut-off of Russian pipeline gas exports to the EU unevenly impacts the energy mix and gas prices across subregions within the EU, depending on their access to alternative gas pipelines and liquefied natural gas infrastructure. The restrictions also affect global gas infrastructure capacity additions, asset stranding, and trade dynamics. Our results show that the Fit-for-55 policy framework already improves the EU's resilience against a cut-off of Russian pipeline gas, while additional improvements in energy efficiency and renewable targets could further soften impacts.
Keywords:	Energy system, Natural gas, Energy trade, Integrated assessment models, Climate policy
DOI:	https://doi.org/10.1016/j.esr.2024.101450
First Online:	07 June 2024
Repository:	Zenodo (Link: https://zenodo.org/records/11536659)
Synergies with:	HE DIAMOND (GA: 101081179), HE TRANSIENCE (GA: 101137606)
Citation (APA):	Sampedro, J., van de Ven, D.-J., Horowitz, R., Rodés-Bachs, C., Frilingou, N., Nikas, A., Binsted, M., Iyer, G., & Yarlagadda, B. (2024). Energy system analysis of cutting off Russian gas supply to the European Union. <i>Energy Strategy Reviews</i> , 54, 101450.

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Energy Strategy Reviews

Volume 54, July 2024, 101450



Energy system analysis of cutting off Russian gas supply to the European Union

Jon Sampedro ^a , Dirk-Jan Van de Ven ^a, Russell Horowitz ^a, Clàudia Rodés-Bachs ^a,
Natasha Frilingou ^b, Alexandros Nikas ^b, Matthew Binsted ^c, Gokul Iyer ^c, Brinda Yarlagadda ^c

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Highlights

- Reduced Russian gas increases EU domestic gas production and non-Russian imports.
- The new composition of the gas import mix increases EU prices of wholesale gas.
- EU subregions with more access to non-Russian gas are more resilient to the cut-off.
- The crisis impacts global gas infrastructure capacity additions and asset stranding.
- More ambitious RES targets may help to soften the impacts of the energy crisis.

Figure 28. Preview of 'Energy system analysis of cutting off Russian gas supply to the European Union' in Energy Strategy Reviews

2.29 Fragkos et al. (2024), Climate

Title:	Analysing the Transformative Changes of Nationally Determined Contributions and Long-Term Targets
Authors:	Panagiotis Fragkos, Dirk-Jan van de Ven, Russell Horowitz, Eleftheria Zisarou
Journal:	Climate
Abstract:	As the imperative to address climate change intensifies, understanding the effectiveness of policy interventions becomes paramount. In the context of addressing these urgent challenges and given the inadequacy of current policies to address this issue, this study examines the extent to which Nationally Determined Contributions (NDCs) and Long-Term Targets (LTTs) can contribute to achieving ambitious climate goals. Recognizing the critical need for effective climate action, we employ the advanced modelling tools PROMETHEUS and GCAM to assess the implications of different scenarios—Current Policies (CP), Nationally Determined Contributions (NDC), and combination of NDCs with Long-Term Targets (NDC_LTT)—on the future development of energy system and emission. This study, by employing these well-known models, seeks to provide an improved understanding of the impacts of NDCs on global emission trajectories and whether the integration of NDCs and LTTs can help close the gap towards Paris-compatible pathways. The study analyzes various sectors including buildings, transportation, electricity generation, and industry to provide insights into the limitations of existing policies and the potential of enhanced commitments to drive transformative changes in a global scale. The effectiveness of these policies varies across different sectors, highlighting the challenges that need to be addressed for achieving the required emission reduction targets in the medium- and long-term. Key findings indicate significant shifts in energy consumption, fuel mix, technology adoption, and emission trajectories, particularly under the synergistic action represented by the NDC_LTT scenario.
Keywords:	Stakeholders; co-creation; sustainability
DOI:	https://doi.org/10.3390/CLI12060087
First Online:	11 June 2024
Repository:	Zenodo (Link: https://zenodo.org/records/11621869)
Synergies with:	H2020 NDC ASPECTS (GA: 101003866)
Citation (APA):	Fragkos, P., Ven, D.-J. van de, Horowitz, R., & Zisarou, E. (2024). Analysing the Transformative Changes of Nationally Determined Contributions and Long-Term Targets. <i>Climate</i> 2024, 12(6), 87.

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Analysing the Transformative Changes of Nationally Determined Contributions and Long-Term Targets

by Panagiotis Fragkos ^{1,*} , Dirk-Jan van de Ven ² , Russell Horowitz ²  and Eleftheria Zisarou ¹ 

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Abstract

As the imperative to address climate change intensifies, understanding the effectiveness of policy interventions becomes paramount. In the context of addressing these urgent challenges and given the inadequacy of current policies to address this issue, this study examines the extent to which Nationally Determined Contributions (NDCs) and Long-Term Targets (LTTs) can contribute to achieving ambitious climate goals. Recognizing the critical need for effective climate action, we employ the advanced modelling tools PROMETHEUS and GCAM to assess the implications of different scenarios—Current Policies (CP), Nationally Determined Contributions (NDC), and combination of NDCs with Long-Term Targets (NDC_LTT)—on the future development of energy system and emission. This study, by employing these well-known models, seeks to provide an improved understanding of the impacts of NDCs on global emission trajectories and whether the integration of NDCs and LTTs can help close the gap towards Paris-compatible pathways. The study analyzes various sectors including buildings, transportation, electricity generation, and industry to provide insights into the limitations of existing policies and the potential of enhanced commitments to drive transformative changes in a global scale. The effectiveness of these policies varies across different sectors, highlighting the challenges that need to be addressed for achieving the required emission reduction targets in the medium- and long-term. Key findings indicate significant shifts in energy consumption, fuel mix, technology adoption, and emission trajectories, particularly under the synergistic action represented by the

Figure 29. Preview of ‘Analysing the Transformative Changes of Nationally Determined Contributions and Long-Term Targets’ in *Climate*

2.30 Rinaldi et al. (2024), Environmental Research Letter

Title:	Assessing environmental and market implications of steel decarbonisation strategies: a hybrid input-output model for the European Union
Authors:	Lorenzo Rinaldi, Debora Ghezzi, Emanuela Colombo, Matteo Vincenzo Rocco
Journal:	Environmental Research Letter
Abstract:	As a key material for manufacturing clean energy technologies, steel is crucial for energy transition, but its production causes 2.6 Gton of CO₂ emissions at global level each year. In 2020 the European Union (EU) set a net-zero emissions target by 2050, fostering innovation in the steel industry to reduce its environmental impact. However, a scenario-oriented and technologically comprehensive analysis assessing prospected environmental and market implications of steel decarbonisation strategies remains a gap, which is addressed in this paper. The analysis adopts a hybrid input-output-based LCA model built in the MARIO framework, extending the Exiobase database to represent the supply chains of the most promising low-carbon steelmaking technologies in the EU, such as hydrogen- or charcoal-injected blast furnaces and natural gas- and hydrogen-based direct reduction routes. The penetration of these technologies is explored by formulating scenarios resembling European climate targets. The results show a reduction in the carbon footprint of steel across all scenarios, ranging up to -26% in 2030 and to -60% in 2050. However, the extent of footprint reduction is highly dependent on the share of clean electricity in the European supply mix, highlighting the relevance of holistic decarbonization strategies. Economic implications affect steel prices, which rise up to 25% in 2030 and 56% in 2050, opening discussions on the need for suitable policies such as CBAM to avoid protectionism and encourage international technological progress.
Keywords:	
DOI:	https://doi.org/10.1088/1748-9326/ad5bf1
First Online:	05 July 2024
Repository:	Zenodo (Link: https://zenodo.org/records/12651159)
Synergies with:	N/A
Citation (APA):	Rinaldi, L., Ghezzi, D., Colombo, E., & Rocco, M. V. (2024). Assessing environmental and market implications of steel decarbonisation strategies: a hybrid input-output model for the European Union. <i>Environmental Research Letters</i> , 19, 074059.

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LETTER • OPEN ACCESS

Assessing environmental and market implications of steel decarbonisation strategies: a hybrid input-output model for the European union

Lorenzo Rinaldi, Debora Ghezzi, Emanuela Colombo and Matteo Vincenzo Rocco
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[Environmental Research Letters, Volume 19, Number 7](#)
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DOI 10.1088/1748-9326/ad5bf1

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Article information ▾

Abstract

As a key material for manufacturing clean energy technologies, steel is crucial for energy transition, but its production causes 2.6 Gton of CO₂ emissions at global level each year. In 2020 the European Union (EU) set a net-zero emissions target by 2050, fostering innovation in the steel industry to reduce its environmental impact. However, a scenario-oriented and technologically comprehensive analysis assessing prospected environmental and market implications of steel decarbonisation strategies remains a gap, which is addressed in this paper. The analysis adopts a hybrid input-output-based life-cycle assessment model built in the MARIO framework, extending the Exiobase database to represent the supply chains of the most promising low-carbon steelmaking technologies in the EU, such as hydrogen- or charcoal-injected blast furnaces and natural gas- and hydrogen-based direct reduction routes. The penetration of these technologies is explored by formulating scenarios resembling European climate targets. The results show a reduction in the carbon footprint of steel across all scenarios, ranging up to –26% in 2030 and to –60% in 2050. However, the extent of footprint reduction is highly dependent on the share of clean electricity in the European supply mix, highlighting

Figure 30. Preview of ‘Assessing environmental and market implications of steel decarbonisation strategies: a hybrid input-output model for the European Union’ in Environmental Research Letter

2.31 Sampedro et al. (2024), Environmental Research Letters

Title:	Residential energy demand, emissions, and expenditures at regional and income-decile level for alternative futures
Authors:	Jon Sampedro, Stephanie T. Waldhoff, James A. Edmonds, Gokul Iyer, Siwa Msangi, Kanishka B Narayan, Pralit L. Patel, Marshall Wise
Journal:	Environmental Research Letters
Abstract:	Income and its distribution profile are important determinants of residential energy demand and carry direct implications for human well-being and climate. We explore the sensitivity of residential energy systems to income growth and distribution across SSP-RCP scenarios using a global, integrated, multisector dynamics model, GCAM, which tracks national/regional household energy services and fuel choice by income decile. Nation/region energy use patterns across deciles tend to converge over time with aggregate income growth, as higher-income consumers approach satiation levels in floorspace and energy services. However, in some regions, existing within-region inequalities in energy consumption persist over time due to slow income growth in lower income groups. Due to continued differences in fuel types, lower income groups will have higher exposure to household air pollution, despite lower contributions to greenhouse gas emissions. We also find that the share of income dedicated to energy is higher for lower deciles, with strong regional differences.
Keywords:	
DOI:	https://doi.org/10.1088/1748-9326/ad6015
First Online:	19 July 2024
Repository:	Zenodo (Link: https://zenodo.org/records/12705894)
Synergies with:	GRAPHICS (GA: 101060679)
Citation (APA):	Sampedro, J., Waldhoff, S. T., Edmonds, J. A., Iyer, G. C., Msangi, S., Narayan, K. B., Patel, P. L., & Wise, M. (2024). Residential energy demand, emissions, and expenditures at regional and income-decile level for alternative futures. Environmental Research Letters, in press

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ENVIRONMENTAL RESEARCH LETTERS 

LETTER • OPEN ACCESS

Residential energy demand, emissions, and expenditures at regional and income-decile level for alternative futures

Jon Sampedro, Stephanie T Waldhoff^{*}, James A Edmonds, Gokul Iyer, Siwa Msangi, Kanishka B Narayan, Pralit Patel and Marshall Wise

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Citation Jon Sampedro *et al* 2024 *Environ. Res. Lett.* **19** 084031

DOI 10.1088/1748-9326/ad6015

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Abstract

Income and its distribution profile are important determinants of residential energy demand and carry direct implications for human well-being and climate. We explore the sensitivity of residential energy systems to income growth and distribution across shared socioeconomic pathway-representative concentration pathways scenarios using a global, integrated, multisector dynamics model, Global Change Analysis Model, which tracks national/regional household energy services and fuel choice by income decile. Nation/region energy use patterns across deciles tend to converge over time with aggregate income growth, as higher-income consumers approach satiation levels in floorspace and energy services. However, in some regions, existing within-region inequalities in energy consumption persist over time due to slow income growth in lower income groups. Due to continued differences in fuel types, lower income groups will have higher exposure to household air pollution, despite lower contributions to greenhouse gas emissions. We also find that the share of income dedicated to energy is higher for lower deciles, with strong regional differences.

Figure 31. Preview of 'Residential energy demand, emissions, and expenditures at regional and income-decile level for alternative futures' in Environmental Research Letters

2.32 Nikas (2024), PLOS Climate

Title:	Projecting progress in sustainable development goals vis-à-vis climate action in climate-economy models
Authors:	Alexandros Nikas
Journal:	PLOS Climate
Abstract:	The year 2015 was an important milestone in the world’s struggle for sustainability. Although mostly remembered for the landmark Paris Agreement, which formalised and operationalised a mechanism for globally coordinated and cooperative efforts to address the climate crisis, it also featured the UN-wide adoption of the 2030 Agenda for Sustainable Development, embodied in seventeen distinct yet highly intertwined dimensions—the Sustainable Development Goals (SDGs). These inter alia include poverty and hunger elimination, alleviating social and gender inequalities, fostering peace and the development of strong institutions, making production responsible, environmental and biodiversity protection, and achieving good health and well-being.
Keywords:	Climate change, Sustainability science, Climate modeling, Optimization, Ecosystems, Scientists, Socioeconomic aspects of health, Research grants
DOI:	https://doi.org/10.1371/journal.pclm.0000449
First Online:	16 July 2024
Repository:	Zenodo (Link: https://zenodo.org/records/12760230)
Synergies with:	HE DIAMOND (GA: 101081179), HE TRANSIENCE (GA: 101137606)
Citation (APA):	Nikas, A. (2024). Projecting progress in sustainable development goals vis-à-vis climate action in climate-economy models. PLOS Clim, 3(7), e0000449.



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OPINION

Projecting progress in sustainable development goals vis-à-vis climate action in climate-economy models

Alexandros Nikas 

Published: July 16, 2024 • <https://doi.org/10.1371/journal.pclm.0000449>

Article	Authors	Metrics	Comments	Media Coverage
				

Introductory comments

Getting the most of climate-economic models in projecting SDG progress

Concluding remarks

Funding

References

Reader Comments

Citation: Nikas A (2024) Projecting progress in sustainable development goals vis-à-vis climate action in climate-economy models. PLOS Clim 3(7): e0000449. <https://doi.org/10.1371/journal.pclm.0000449>

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Competing interests: The author declares that no competing interests exist.

Introductory comments

The year 2015 was an important milestone in the world's struggle for sustainability. Although mostly remembered for the landmark Paris Agreement, which formalised and operationalised a mechanism for globally coordinated and cooperative efforts to address the climate crisis, it also featured the UN-wide adoption of the 2030 Agenda for Sustainable Development, embodied in seventeen distinct yet highly intertwined dimensions—the Sustainable Development Goals (SDGs). These *inter alia* include poverty and hunger elimination, alleviating social and gender inequalities, fostering peace and the development of strong institutions, making production responsible, environmental and biodiversity protection, and achieving good health and well-

Figure 32. Preview of 'Projecting progress in sustainable development goals vis-à-vis climate action in climate-economy models' in PLOS Climate

2.33 Alanazi et al. (2024), Energy Proceedings

Title:	A Novel Framework for Simulating Market Equilibrium in International Hydrogen Trade
Authors:	Khalid Alanazi, Shivika Mittal, Adam Hawkes, Nilay Shah
Journal:	Energy Proceedings
Abstract:	Hydrogen has gained significant attention as a possibly important energy vector in the pursuit of climate change mitigation objectives. Global demand for renewable hydrogen is anticipated to increase across many decarbonization scenarios. To meet this demand, many countries have unveiled strategies aimed at bolstering domestic low-carbon hydrogen production or facilitating imports. Within this context, international trade has emerged as a means of importing hydrogen from regions with low-cost production capabilities. However, investment decisions in the development of international hydrogen markets are moving slowly due to large uncertainties regarding the magnitude of future demand and willingness to pay for hydrogen in key end- use applications. In this study, we develop a novel modelling framework capable of simulating global hydrogen market equilibrium and international trade scenarios in the long-term future. Our methodology includes the development of supply and demand curves, as well as a global hydrogen trade model that takes into account various supply chain options. Using this framework, we are able to derive quantitative insights into equilibrium supply and demand, pricing dynamics, trade flows, costs, and many more. We apply this framework to investigate the optimal development of hydrogen markets in 2050 under a 1.5°C climate change mitigations scenario. Our findings indicate that new hydrogen sectors could see a global demand surge to 195.2 Mt, with international trade constituting a quarter of this demand.
Keywords:	hydrogen trade, hydrogen markets, energy systems modelling, supply-demand equilibrium
DOI:	https://doi.org/10.46855/energy-proceedings-11165
First Online:	16 July 2024
Repository:	Zenodo (Link: https://zenodo.org/records/12759250)
Synergies with:	UK Foreign, Commonwealth & Development Office Climate Compatible Growth (GA: GB-GOV-1-300125
Citation (APA):	Alanazi, K., Mittal, S., Hawkes, A., & Shah, N. (2024). A Novel Framework for Simulating Market Equilibrium in International Hydrogen Trade. Energy Proceedings, 46.



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Volume 46: Energy Transitions toward Carbon Neutrality: Part IX

A Novel Framework for Simulating Market Equilibrium in International Hydrogen Trade

Khalid Alanazi, Shivika Mittal, Adam Hawkes, Nilay Shah

<https://doi.org/10.46855/energy-proceedings-11165>**Abstract**

Hydrogen has gained significant attention as a possibly important energy vector in the pursuit of climate change mitigation objectives. Global demand for renewable hydrogen is anticipated to increase across many decarbonization scenarios. To meet this demand, many countries have unveiled strategies aimed at bolstering domestic low-carbon hydrogen production or facilitating imports. Within this context, international trade has emerged as a means of importing hydrogen from regions with low-cost production capabilities. However, investment decisions in the development of international hydrogen markets are moving slowly due to large uncertainties regarding the magnitude of future demand and willingness to pay for hydrogen in key end-use applications.

In this study, we develop a novel modelling framework capable of simulating global hydrogen market equilibrium and international trade scenarios in the long-term future. Our methodology includes the development of supply and demand curves, as well as a global hydrogen trade model that takes into account various supply chain options. Using this framework, we are able to derive quantitative insights into equilibrium supply and demand, pricing dynamics, trade flows, costs, and many more. We apply this framework to investigate the optimal development of hydrogen markets in 2050 under a 1.5°C climate change mitigations scenario. Our findings indicate that new hydrogen sectors could see a global demand surge to 195.2 Mt, with international trade constituting a quarter of this demand.

Keywords

hydrogen trade, hydrogen markets, energy systems modelling, supply-demand equilibrium



Figure 33. Preview of 'A Novel Framework for Simulating Market Equilibrium in International Hydrogen Trade' in Energy Proceedings

2.34 Reisinger et al. (2024), Communications Earth & Environment

Title:	Science-based targets miss the mark
Authors:	Andy Reisinger, Annette L. Cowie, Oliver Geden, Alaa Al Khourdajie
Journal:	Communications Earth & Environment
Abstract:	Achieving the long-term temperature goal of the Paris Agreement relies on every actor maximising their effort to reduce emissions. Generic targets claiming a basis in science have been used to justify inequitable efforts that insufficiently stretch the ambition of the best-resourced countries and companies.
Keywords:	Climate-change mitigation, Climate-change policy
DOI:	https://doi.org/10.1038/s43247-024-01535-z
First Online:	23 July 2024
Repository:	Zenodo (Link: https://zenodo.org/records/12801166)
Synergies with:	N/A
Citation (APA):	Reisinger, A., Cowie, A. L., Geden, O., & al Khourdajie, A. (2024). Science-based targets miss the mark. Communications Earth & Environment 5(1), 383

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Science-based targets miss the mark

[Andy Reisinger](#) , [Annette L. Cowie](#), [Oliver Geden](#) & [Alaa Al Khourdajie](#)

Communications Earth & Environment 5, Article number: 383 (2024) | [Cite this article](#)

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Achieving the long-term temperature goal of the Paris Agreement relies on every actor maximising their effort to reduce emissions. Generic targets claiming a basis in science have been used to justify inequitable efforts that insufficiently stretch the ambition of the best-resourced countries and companies.

Science-based targets are proliferating not only in the corporate world, but national targets also often claim to reflect what science says is needed to limit warming to 1.5 °C. Such claims often rely on condensing diverse and complex scientific findings into simple and easily communicated benchmarks for corporate or national action towards global goals, such as reaching net-zero emissions by 2050. Typically, they cite the Intergovernmental Panel on Climate Change (IPCC) as the authoritative scientific source. Assertions of a basis in science aim to assure stakeholders, shareholders and the public that the level of ambition expressed by such targets is not the result of political contestation and moral judgements but is derived from objective scientific methods.

We argue that such a narrow conceptualisation of science to guide and justify targets for individual companies or countries is misleading. Simplistic use of global averages taken from IPCC reports, used out of context and generically applied to a broad diversity of individual actors, leads to inefficiency and inequity, higher emissions and more warming than intended. Indeed, such a generic approach is the very opposite of using science to inform actions consistent with the objectives of the Paris Agreement.

Figure 34. Preview of 'Science-based targets miss the mark' in Communications Earth & Environment

2.35 Saltelli et al. (2024), Wiley Interdisciplinary Reviews: Climate Change

Title:	Bring digital twins back to Earth
Authors:	Andrea Saltelli, Gerd Gigerenzer, Mike Hulme, Konstantinos V. Katsikopoulos, Lieke A. Melsen, Glen P. Peters, Roger Pielke Jr, Simon Robertson,, Andy Stirling, Massimo Tavoni, Arnald Puy
Journal:	Wiley Interdisciplinary Reviews: Climate Change
Abstract:	We reflect on the development of digital twins of the Earth, which we associate with a reductionist view of nature as a machine. The projects of digital twins deviate from contemporary scientific paradigms in the treatment of complexity and uncertainty, and does not engage with critical and interpretative social sciences. We contest the utility of digital twins for addressing climate change issues and discuss societal risks associated with the concept, including the twins' potential to reinforce economicism and governance by numbers, emphasizing concerns about democratic accountability. We propose a more balanced alternative, advocating for independent institutions to develop diverse models, prioritize communication with simple heuristic-based models, collect comprehensive data from various sources, including traditional knowledge, and shift focus away from physics-centered variables to inform climate action. We argue that the advancement of digital twins should hinge on stringent controls, favoring a nuanced, interdisciplinary, and democratic approach that prioritizes societal well-being over blind pursuit of computational sophistication.
Keywords:	
DOI:	https://doi.org/10.1002/wcc.915
First Online:	26 August 2024
Repository:	Zenodo (Link: https://zenodo.org/records/13643067)
Synergies with:	HE i4Driving (GA: 101076165)
Citation (APA):	Saltelli, A., Gigerenzer, G., Hulme, M., Katsikopoulos, K. v., Melsen, L. A., Peters, G. P., Pielke, Robertson, S., Stirling, A., Tavoni, M., & Puy, A. (2024). Bring digital twins back to Earth. Wiley Interdisciplinary Reviews: Climate Change, e915.



The screenshot shows the Wiley Interdisciplinary Reviews: Climate Change website. At the top, there is a search bar and navigation links for 'JOURNALS' and 'EXPLORE'. Below the navigation bar, the 'WIREs CLIMATE CHANGE' logo is displayed, along with logos for 'RMetS' and the 'Royal Geographical Society'. The article title 'Bring digital twins back to Earth' is prominently featured, followed by the authors' names: Andrea Saltelli, Gerd Gigerenzer, Mike Hulme, Konstantinos V. Katsikopoulos, Lieke A. Melsen, Glen P. Peters, Roger Pielke Jr, Simon Robertson, Andy Stirling, Massimo Tavoni, and Arnald Puy. The publication date is 'First published: 26 August 2024', the DOI is 'https://doi.org/10.1002/wcc.915', and there are 'Citations: 4'. The article is edited by Matthias Heymann and Maria Carmen Lemos. Below the article information, there are icons for 'SECTIONS', 'PDF', 'TOOLS', and 'SHARE'. The 'Abstract' section is visible, starting with the text: 'We reflect on the development of digital twins of the Earth, which we associate with a reductionist view of nature as a machine. The projects of digital twins deviate from contemporary scientific paradigms in the treatment of complexity and uncertainty, and does not engage with critical and interpretative social sciences. We contest the utility of digital twins for addressing climate change issues and discuss societal risks associated with the concept, including the twins' potential to reinforce economicism and governance by numbers, emphasizing concerns about democratic accountability. We propose a more balanced alternative, advocating for independent institutions to develop diverse models, prioritize communication with simple heuristic-based models, collect comprehensive data from various sources, including traditional knowledge, and shift focus away from physics-centered variables to inform climate action. We argue that the advancement of digital twins should hinge on stringent controls, favoring a nuanced, interdisciplinary, and democratic approach that prioritizes societal well-being over blind pursuit of computational sophistication.'

Figure 35. Preview of 'Bring digital twins back to Earth' in Wiley Interdisciplinary Reviews: Climate Change

2.36 Li et al. (2024), Energy Policy

Title:	Revealing technological entanglements in uncertain decarbonisation pathways using bayesian networks
Authors:	Pei-Hao Li, Behzad Zamanipour, Ilkka Keppo
Journal:	Energy Policy
Abstract:	To effectively meet the ambitious objectives set by the Paris Agreement, gaining a deeper understanding of the relationships between the key technologies involved in mitigation activities is pivotal. This research uses Bayesian Network (BN) methodology on a large ensemble of energy system model runs, aiming to shed light on the complex interdependencies, and related uncertainties, among the various technologies within the pathways. We specifically focus on tracking the evolution and interconnectedness of technology portfolios over time, enabling dynamic assessments of the impacts linked to specific deployment strategies. The results suggest that prioritizing early-stage transitions within the building sector is imperative and the consistent deployment of district heating emerges as a pivotal element in the long-term plans for decarbonisation. In the power sector, the rising trends in electrification and the substantial growth in low-carbon power plants and wind energy deployment, underscore the urgency for adaptable strategies within the power sector. Notably, the integration of bioenergy with carbon capture and storage (BECCS) also emerges as a crucial technology, offering a means to counterbalance emissions from carbon-intensive industries. The BN-based approach provides decision makers a powerful tool for comprehensive, informed, and systematic planning as they navigate towards a carbon-neutral future, but it is also crucial to acknowledge the reliance of our analysis on assumptions inherent in energy system models. Studies using different assumptions and model structures are needed to confirm the generalizability of our findings.
Keywords:	Uncertainty, Decarbonisation pathways, Bayesian networks, Energy system model
DOI:	https://doi.org/10.1016/j.enpol.2024.114273
First Online:	29 July 2024
Repository:	Zenodo (Link: https://zenodo.org/records/13692215)
Synergies with:	N/A
Citation (APA):	Li, P. H., Zamanipour, B., & Keppo, I. (2024). Revealing technological entanglements in uncertain decarbonisation pathways using bayesian networks. Energy Policy, 193, 114273.

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Energy Policy

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Revealing technological entanglements in uncertain decarbonisation pathways using bayesian networks

Pei-Hao Li ^a, Behzad Zamanipour ^b , Ilkka Keppo ^{a, b}[Show more](#) [+](#) Add to Mendeley [🔗](#) Share [📄](#) Cite<https://doi.org/10.1016/j.enpol.2024.114273> [Get rights and content](#)

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Highlights

- The evolution of technology portfolios within uncertain pathways is assessed.
- It is vital to prioritize early-stage transition efforts in the building sector.
- Low-carbon power plants should dramatically ramp up in the later period.
- Deployment of district heating should be persistent over time.
- Bioenergy with carbon capture and storage technology is critical to offset GHG emissions.

Figure 36. Preview of 'Revealing technological entanglements in uncertain decarbonisation pathways using bayesian networks' in Energy Policy

2.37 Schenuit et al. (2024), One Earth

Title:	Five principles for robust carbon dioxide removal policy in the G7
Authors:	Felix Schenuit, Oliver Geden, Glen P. Peters
Journal:	One Earth
Abstract:	Carbon dioxide removal (CDR) policy is evolving rapidly but remains fragmented. Upcoming initiatives by the G7 members, which face expectations to be frontrunners in CDR deployment, should follow five principles for robust policies. This will be critical to prepare for distributional conflicts associated with achieving net-zero and net-negative emissions, both domestically and internationally.
Keywords:	Mitigation
DOI:	https://doi.org/10.1016/j.oneear.2024.08.015
First Online:	20 September 2024
Repository:	Zenodo (Link:)
Synergies with:	N/A
Citation (APA):	Schenuit, F., Geden, O., & Peters, G. P. (2024). Five principles for robust carbon dioxide removal policy in the G7. <i>One Earth</i> , 7(9), 1487-1491.

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Five principles for robust carbon dioxide removal policy in the G7

[Felix Schenuit](#)¹ [Oliver Geden](#)¹ [Glen P. Peters](#)²

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Abstract

Carbon dioxide removal (CDR) policy is evolving rapidly but remains fragmented. Upcoming initiatives by the G7 members, which face expectations to be frontrunners in CDR deployment, should follow five principles for robust policies. This will be critical to prepare for distributional conflicts associated with achieving net-zero and net-negative emissions, both domestically and internationally.



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2024
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Figure 37. Preview of 'Five principles for robust carbon dioxide removal policy in the G7' in One Earth

2.38 Calcaterra et al. (2024), Nature Energy

Title:	Reducing the cost of capital to finance the energy transition in developing countries
Authors:	Matteo Calcaterra, Lara Aleluia Reis, Panagiotis Fragkos, Thibault Briere, Harmen Sytze de Boer, Florian Egli, Johannes Emmerling, Gokul Iyer, Shivika Mittal, Friedemann Polzin, Mark Sanders, Tobias S. Schmidt, Sasha Serebriakova, Bjarne Steffen, Dirk-Jan van de Ven, Detlef van Vuuren, Paul Waidelich, Massimo Tavoni
Journal:	Nature Energy
Abstract:	Climate stabilisation requires the mobilization of substantial investments in low- and zero-carbon technologies, especially in emerging and developing economies. However, access to stable and affordable finance varies dramatically across countries. Models used to evaluate the energy transition do not differentiate regional financing costs and therefore cannot study risk-sharing mechanisms for renewable electricity generation. In this study, we incorporated the empirically estimated cost of capital differentiated by country and technology into an ensemble of five climate–energy–economy models. We quantified the additional financing cost of decarbonisation borne by developing regions and explored policies of risk premium convergence across countries. We found that alleviating financial constraints benefits both climate and equity as a result of more renewable and affordable energy in the developing world. This highlights the importance of fair finance for energy availability, affordability and sustainability, as well as the need to include financial considerations in model-based assessments.
Keywords:	Climate finance, Climate-change mitigation, Energy access, Finance, Renewable energy
DOI:	https://doi.org/10.1038/s41560-024-01606-7
First Online:	27 September 2024
Repository:	Zenodo (Link: https://zenodo.org/records/13864212)
Synergies with:	HE DIAMOND (GA: 101081179), H2020 ECEMF (GA: 101022622), HE ELEVATE (GA: 101056873), H2020 INNOPATHS (GA: 730403), HE PRISMA (GA: 101081604)
Citation (APA):	Calcaterra, M., Aleluia Reis, L., Fragkos, P., Briera, T., de Boer, H. S., Egli, F., ... & Tavoni, M. (2024). Reducing the cost of capital to finance the energy transition in developing countries. <i>Nature Energy</i> , 9, 1241–1251.

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Reducing the cost of capital to finance the energy transition in developing countries

[M. Calcaterra](#) , [L. Aleluia Reis](#), [P. Fragkos](#), [T. Briera](#), [H. S. de Boer](#), [F. Egli](#), [J. Emmerling](#), [G. Iyer](#), [S. Mittal](#), [F. H. J. Polzin](#), [M. W. J. L. Sanders](#), [T. S. Schmidt](#), [A. Serebriakova](#), [B. Steffen](#), [D. J. van de Ven](#), [D. P. van Vuuren](#), [P. Waidelich](#) & [M. Tavoni](#)

Nature Energy **9**, 1241–1251 (2024) | [Cite this article](#)

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Abstract

Climate stabilization requires the mobilization of substantial investments in low- and zero-carbon technologies, especially in emerging and developing economies. However, access to stable and affordable finance varies dramatically across countries. Models used to evaluate the energy transition do not differentiate regional financing costs and therefore cannot study risk-sharing mechanisms for renewable electricity generation. In this study, we incorporated the empirically estimated cost of capital differentiated by country and technology into an ensemble of five climate–energy–economy models. We quantified the additional financing cost of decarbonization borne by developing regions and explored policies of risk premium convergence across countries. We found that alleviating financial constraints benefits both climate and equity as a result of more renewable and affordable energy in the developing world. This highlights the importance of fair finance for energy availability, affordability and sustainability, as well as the need to include financial considerations in model-based assessments.

Figure 38. Preview of ‘Reducing the cost of capital to finance the energy transition in developing countries’ in Nature Energy

2.39 Millot et al. (2024), Cell Reports Sustainability

Title:	The map behind the roadmap—Introducing a geospatial energy model for utility-scale solar and wind power buildout in Kenya
Authors:	Ariane Millot, Pietro Lubello, Elizabeth M. Tennyson, Martin Mutembei, Michelle Akute, Dimitris Mentis, Steve Pye, Adam Hawkes, Sebastian Sterl
Journal:	Cell Reports Sustainability
Abstract:	Advancements in electricity access, economic development, and population increase are just some of the elements driving electricity demand growth in Africa. Open and transparent energy system models, coupled with geographically detailed and reliable data, are essential tools for planning sustainable systems capable of providing low-cost electricity for all. This study helps address these challenges by introducing a methodology to identify the optimal locations for solar and wind power plants, considering the trade-off between exploiting the best resources and the costs of expanding the electrical grid to reach them. The method, readily applicable to all African countries, is showcased in Kenya, where solar and wind resources, coupled with batteries, could constitute the backbone of a diversified power system. The optimal selection of sites is driven by a nontrivial interaction between resource strength, distance from the grid, and temporal profiles, proving the added value of introducing explicit geospatial information in energy system models.
Keywords:	Regional modelling, energy system modeling, geospatial modeling, power system planning, capacity expansion, variable renewable energy, Kenya, Africa
DOI:	https://doi.org/10.1016/j.crsus.2024.100222
First Online:	11 October 2024
Repository:	Zenodo (Link: https://zenodo.org/records/14266641)
Synergies with:	UK Foreign, Commonwealth & Development Office Climate Compatible Growth (GA: GB-GOV-1-300125), HE RE-INTEGRATE (GA: 101118217)
Citation (APA):	Millot, A., Lubello, P., Tennyson, E. M., Mutembei, M., Akute, M., Mentis, D., ... & Sterl, S. (2024). The map behind the roadmap—Introducing a geospatial energy model for utility-scale solar and wind power buildout in Kenya. <i>Cell Reports Sustainability</i> , 1(10), 100222.

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The map behind the roadmap—Introducing a geospatial energy model for utility-scale solar and wind power buildout in Kenya

[Ariane Millot](#)^{1,9} · [Pietro Lubello](#)^{2,9,10} · [Elizabeth M. Tennyson](#)^{3,4} · ... · [Steve Pye](#)² · [Adam Hawkes](#)¹ · [Sebastian Steri](#)^{7,8} ...
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Science for society

Advancements in electricity access, economic development, and population increase are just some of the elements driving electricity demand growth in Africa. Open and transparent energy system models, coupled with geographically detailed and reliable data, are essential tools for planning sustainable systems capable of providing low-cost electricity for all. This study helps address these challenges by introducing a methodology to identify the optimal locations for solar and wind power plants, considering the trade-off between exploiting the best resources and the costs of expanding the electrical grid to reach them. The method, readily applicable to all African countries, is showcased in Kenya, where solar and wind resources, coupled with batteries, could constitute the backbone of a diversified power system. The optimal selection of sites is driven by a nontrivial interaction between resource strength, distance from the grid, and temporal profiles, proving the added value of introducing explicit geospatial information in energy system models.

Highlights

- A geospatially explicit description of VRE enhances power system model planning
- The future Kenyan power system can rely on high penetration of VRE alongside batteries
- The VRE site selection is nontrivial and not solely determined by capacity factors

Summary

For many African countries, energy models point toward variable renewable energy (VRE), mainly solar photovoltaics and wind power, as the potential backbone of future power systems. However, such models have not typically been able to explicitly include geospatial aspects around future VRE power plant siting with respect to cost optimization. For instance, should one build far from the grid in search of excellent resources or rather stay close to existing infrastructure to keep costs low? Here, we present an open-source energy modeling system (OSeMOSYS)-FlexTool workflow for capacity expansion and dispatch optimization planning for African countries that explicitly includes the geospatial dimension of VRE buildout. Applying the model to Kenya, we identify clear and nontrivial links between site characteristics and siting preferences in the optimization results, which moreover differ markedly for solar and wind power. This highly replicable approach has important implications for power system planning, especially in African countries whose grids will be VRE-heavy in the future.

Figure 39. Preview of ‘The map behind the roadmap—Introducing a geospatial energy model for utility-scale solar and wind power buildout in Kenya’ in Cell Reports Sustainability

2.40 Peters (2024), Dialogues on Climate Change

Title:	Is limiting the temperature increase to 1.5° C still possible?
Authors:	Glen P. Peters
Journal:	Dialogues on Climate Change
Abstract:	It is always possible to find arguments to make 1.5°C forever possible, but they increasingly diverge from reality. It is time to admit that the world will cross 1.5°C and the likelihood of returning below 1.5°C via overshoot is slim. But, failing on 1.5°C does not mean the world has failed. The Paris Agreement is about balancing risks in a 'well below 2°C' world, and that level of ambition remains achievable despite a less certain climate outcome. We no longer need scenarios with impossibly steep emission declines to 1.5°C, but more nuanced country-level scenarios integrating national circumstances and feasible ambitions. This is harder for researchers, but more confronting for policy makers. Crossing 1.5°C is not a time to give up but a time to acknowledge our failures and find a new hope moving forward.
Keywords:	Mitigation
DOI:	https://doi.org/10.1177/29768659241293218
First Online:	11 November 2024
Repository:	Zenodo (Link: https://zenodo.org/records/14266603)
Synergies with:	N/A
Citation (APA):	Peters, G. P. (2024). Is limiting the temperature increase to 1.5° C still possible?. Dialogues on Climate Change, in press.

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Open access Article commentary First published online November 11, 2024

Is limiting the temperature increase to 1.5°C still possible?

[Glen P. Peters](#) [View all authors and affiliations](#)

[Volume 1, Issue 1](#) <https://doi.org/10.1177/29768659241293218>

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Abstract

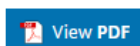
It is always possible to find arguments to make 1.5°C forever possible, but they increasingly diverge from reality. It is time to admit that the world will cross 1.5°C and the likelihood of returning below 1.5°C via overshoot is slim. But, failing on 1.5°C does not mean the world has failed. The Paris Agreement is about balancing risks in a 'well below 2°C' world, and that level of ambition remains achievable despite a less certain climate outcome. We no longer need scenarios with impossibly steep emission declines to 1.5°C, but more nuanced country-level scenarios integrating national circumstances and feasible ambitions. This is harder for researchers, but more confronting for policy makers. Crossing 1.5°C is not a time to give up but a time to acknowledge our failures and find a new hope moving forward.

The worst nightmare at the end of a presentation is the question: 'Is limiting the temperature increase to 1.5°C still possible?'. The speaker squirms and gauges who is listening, and ultimately, provides an overly diplomatic answer weighing up numerous conflicting judgements. The question is open to interpretation and is scientifically, politically, and socially charged. The answer will win or lose friends. I suspect the audience already knows the answer, they presumably only seek joy in watching the speaker squirm.

Figure 40. Preview of 'Is limiting the temperature increase to 1.5° C still possible?' in Dialogues on Climate Change

2.41 Zamanipour & Keppo (2024), Energy Research & Social Science

Title:	What is important for consumers' energy-related decisions? A cross-sectoral systematic review and meta-analysis for the Nordic countries
Authors:	Behzad Zamanipour, Ilkka Keppo
Journal:	Energy Research & Social Science
Abstract:	The energy transition is shaped by the decisions of individuals. These decisions, in turn, are influenced by a diverse set of factors that have been the object of various studies reported in the literature. Most of these studies have, however, focused on a single decision or a sector. Here, we conduct for the Nordic countries a systematic literature review and a meta-analysis of factors affecting four important consumers' energy-related decisions, namely (1) the choice between an electric or a conventional vehicle, (2) mode choice for personal transport, (3) choice of heating system, and (4) deployment of energy-saving measures at home. We aim to identify the implications that certain factors may have for many of such decisions, potentially encouraging some while discouraging others. Our analysis shows that a group of factors, such as attitude, comfort, costs, living in a detached house, emission implications of the choice, perceived behavioral control, environmental friendliness of the technology, and subjective norm, affect multiple decisions uniformly, in terms of the direction of effect the factor has on environmentally benign decisions. There are, however, also factors for which trade-offs exist, for example, while better public transport infrastructure encourages the use of public transport use, it discourages walking and cycling. We also show differences in outcomes between revealed and stated preferences surveys. Our analysis shows that for electric vehicle adoption, the statistical significance of factors typically increases when excluding the stated preferences surveys. Finally, our findings can aid policymakers in crafting more effective interventions to meet climate targets.
Keywords:	Mitigation, EV adoption, Mode choice, Heating system adoption, Energy-saving measures, Systematic review, Revealed and stated preferences
DOI:	https://doi.org/10.1016/j.erss.2024.103861
First Online:	28 November 2024
Repository:	Zenodo (Link:)
Synergies with:	N/A
Citation (APA):	Zamanipour, B., & Keppo, I. (2025). What is important for consumers' energy-related decisions? A cross-sectoral systematic review and meta-analysis for the Nordic countries. <i>Energy Research & Social Science</i> , 119, 103861.

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Energy Research & Social Science

Volume 119, January 2025, 103861



Review

What is important for consumers' energy-related decisions? A cross-sectoral systematic review and meta-analysis for the Nordic countries

Behzad Zamanipour , Ilkka Keppo

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Highlights

- A review and meta-analysis of the factors affecting four energy-related consumer decisions
- We identified the factors that are consistently significant for multiple decisions.
- Some factors both encourage certain pro-environmental decisions and discourage others.
- There are conflicting results based on revealed and stated preferences surveys.
- Providing information to support policymakers in designing behavioral interventions

Figure 41. Preview of 'What is important for consumers' energy-related decisions? A cross-sectoral systematic review and meta-analysis for the Nordic countries' in Energy Research & Social Science

2.42 Nikas et al. (2024), Nature

Title:	Science must up its game to support climate finance negotiations
Authors:	Alexandros Nikas, Natasha Frilingou, Alaa Al Khourdajie, Ajay Gambhir
Journal:	Nature
Abstract:	Financing climate-change mitigation is a win-win for wealthy economies (A. M. Kleinnijenhuis Nature 635, 525; 2024). Yet last month's hurried deal at the COP29 climate talks in Baku, Azerbaijan, did not raise hopes for a better outcome for low- and middle-income countries (LMICs; see Nature https://doi.org/g8rxz5 ; 2024).
Keywords:	Climate finance
DOI:	https://doi.org/10.1038/d41586-024-03945-7
First Online:	03 December 2024
Repository:	Zenodo (Link: https://zenodo.org/records/14266720)
Synergies with:	N/A
Citation (APA):	Nikas, A., Frilingou, N., Al Khourdajie, A., Gambhir, A. (2024). Science must up its game to support climate finance negotiations. Nature, 636, 45.

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CORRESPONDENCE | 03 December 2024

Science must up its game to support climate finance negotiations

By [Alexandros Nikas](#) , [Natasha Frilingou](#), [Alaa Al Khourdajie](#) & [Ajay Gambhir](#)

Financing climate-change mitigation is a win-win for wealthy economies ([A. M. Kleinnijenhuis *Nature* 635, 525; 2024](#)). Yet last month's hurried deal at the COP29 climate talks in Baku, Azerbaijan, did not raise hopes for a better outcome for low- and middle-income countries (LMICs; see *Nature* <https://doi.org/g8rxz5>; 2024).

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Figure 42. Preview of 'Science must up its game to support climate finance negotiations' in Nature

2.43 Stockhause et al. (2024), PLOS Climate

Title:	Implementing FAIR data principles in the IPCC seventh assessment cycle: Lessons learned and future prospects
Authors:	Martina Stockhause, David Huard, Alaa Al Khourdajie, José M. Gutiérrez, Michio Kawamiya, Nana Ama Browne Klutse, Volker Krey, David Milward, Andrew E. Okem, Anna Pirani, Lina E. Sitz, Silvina A.
Journal:	PLOS Climate
Abstract:	Every five to seven years, the Intergovernmental Panel on Climate Change (IPCC) convenes the climate science community to assess the latest knowledge on climate change relevant to policy-makers. This generally takes the form of Assessment Reports (AR) covering the scientific basis of climate change, its impacts and future risks, and options for adaptation and mitigation. With each cycle, these reports have grown in scope, length, number of referenced papers, and underpinning datasets. During the sixth assessment cycle, a large-scale collective effort went into archiving digital products assessed and generated through the IPCC process. The main objectives driving this initiative are making IPCC's work more transparent, improving the reproducibility and reusability of the assessment outcomes, better utilization of the services of the IPCC Data Distribution Centre (DDC), and, more generally, compliance with best practices in open science. This paper expands on the motivations for the curation and preservation of digital objects in the IPCC. It gives an overview of how FAIR (Findable, Accessible, Interoperable, Reusable) and open data principles have been implemented in practice and explores some of the successes and setbacks of the AR6 experience. It concludes with recommendations for consolidation and expansion of the approach for AR7. These include a tighter integration of digital curation activities in the IPCC timeline and workflows, better support of IPCC authors and contributors through early training and use of suitable software, improved standardization and harmonization of data and software handling across Working Groups (WGs), and close collaboration with key external data providers and research organizations.
Keywords:	Open science
DOI:	https://doi.org/10.1371/journal.pclm.0000533
First Online:	09 December 2024
Repository:	Zenodo (Link: https://zenodo.org/records/14499059)
Synergies with:	N/A
Citation (APA):	Stockhause, M., Huard, D., Al Khourdajie, A., Gutiérrez, J.M., Kawamiya, M., Klutse, N.A.B., et al. (2024) Implementing FAIR data principles in the IPCC seventh assessment cycle: Lessons learned and future prospects. PLOS Climate 3(12), e0000533.



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REVIEW

Implementing FAIR data principles in the IPCC seventh assessment cycle: Lessons learned and future prospects

Martina Stockhause , David Huard , Alaa Al Khourdajie , José M. Gutiérrez , Michio Kawamiya ,
 Nana Ama Browne Klutse , Volker Krey , David Milward , Andrew E. Okem , Anna Pirani , Lina E. Sitz ,
 Silvina A. Solman , Alessandro Spinuso , Xiaoshi Xing 

Published: December 9, 2024 • <https://doi.org/10.1371/journal.pclm.0000533>

Article	Authors	Metrics	Comments	Media Coverage
				

Abstract

1. Introduction
2. Implementation across the IPCC AR6
3. AR6 reflections: Successes, experiences and challenges
4. AR7 recommendations and ongoing work
5. Conclusions

Acknowledgments

References

Reader Comments

Figures

Abstract

Every five to seven years, the Intergovernmental Panel on Climate Change (IPCC) convenes the climate science community to assess the latest knowledge on climate change relevant to policy-makers. This generally takes the form of Assessment Reports (AR) covering the scientific basis of climate change, its impacts and future risks, and options for adaptation and mitigation. With each cycle, these reports have grown in scope, length, number of referenced papers, and underpinning datasets. During the sixth assessment cycle, a large-scale collective effort went into archiving digital products assessed and generated through the IPCC process. The main objectives driving this initiative are making IPCC's work more transparent, improving the reproducibility and reusability of the assessment outcomes, better utilization of the services of the IPCC Data Distribution Centre (DDC), and, more generally, compliance with best practices in open science. This paper expands on the motivations for the curation and preservation of digital objects in the IPCC. It gives an overview of how FAIR (Findable, Accessible, Interoperable, Reusable) and open data principles have been implemented in practice and explores some of the successes and setbacks of the AR6 experience. It concludes with recommendations for consolidation and expansion of the approach for AR7. These include a tighter integration of digital curation activities in the IPCC timeline and workflows, better support of IPCC authors and contributors through early training and use of suitable software, improved standardization and harmonization of data and software handling across Working Groups (WGs), and close collaboration with key external data providers and research organizations.

Figure 43. Preview of 'Implementing FAIR data principles in the IPCC seventh assessment cycle: Lessons learned and future prospects' in PLOS Climate

2.44 van de Ven et al. (2025), Nature Climate Change

Title:	Energy and socioeconomic system transformation through a decade of IPCC-assessed scenarios
Authors:	Dirk-Jan Van de Ven, Shivika Mittal, Alexandros Nikas, George Xexakis, Ajay Gambhir, Lukas Hermwille, Panagiotis Fragkos, Wolfgang Obergassel, Mikel González-Eguino, Faidra Filippidou, Ida Sognnaes, Leon Clarke, Glen P. Peters
Journal:	Nature Climate Change
Abstract:	Charting future emissions pathways is a central tenet of IPCC assessment reports (AR), yet it is unclear how underlying drivers (including around policy and technology) have influenced the evolution of emissions pathways. Here we compare scenarios in AR5 and AR6 and find that scenarios without specific climate policies enforced have shifted lower in each scenario generation, owing to falling low-carbon technology costs and reduced expectations for economic growth, reducing fossil-fuel shares in energy and industry. Mitigation pathways consistent with 1.5–2 °C have seen increasing electrification rates and higher shares of variable renewables in electricity in more recent scenario generations, implying reduced reliance on coal, nuclear, bioenergy and carbon capture and storage, reflecting changing costs. Despite the shrinking carbon budget due to insufficient recent climate action, mitigation costs have not increased given more optimistic low-carbon technology cost projections. Moving forward, scenario producers must continually recalibrate to keep abreast of technology, policy and societal developments to remain policy relevant.
Keywords:	
DOI:	https://doi.org/10.1038/s41558-024-02198-6
First Online:	03 January 2025
Repository:	Zenodo (Link: https://zenodo.org/records/14609256)
Synergies with:	HE DIAMOND (GA: 101081179), H2020 NDC ASPECTS (GA: 101003866)
Citation (APA):	van de Ven, D. J., Mittal, S., Nikas, A., Xexakis, G., Gambhir, A., Hermwille, L., ... & Peters, G. P. (2025). Energy and socioeconomic system transformation through a decade of IPCC-assessed scenarios. <i>Nature Climate Change</i> , 15, 218-226.

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Analysis | Published: 03 January 2025

Energy and socioeconomic system transformation through a decade of IPCC-assessed scenarios

[D. J. van de Ven](#) , [S. Mittal](#), [A. Nikas](#), [G. Xexakis](#), [A. Gambhir](#), [L. Hermwille](#), [P. Fragkos](#), [W. Obergassel](#), [M. Gonzalez-Eguino](#), [F. Filippidou](#), [J. Sognnaes](#), [L. Clarke](#) & [G. P. Peters](#)

Nature Climate Change **15**, 218–226 (2025) | [Cite this article](#)

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Abstract

Charting future emissions pathways is a central tenet of IPCC assessment reports (AR), yet it is unclear how underlying drivers (including around policy and technology) have influenced the evolution of emissions pathways. Here we compare scenarios in AR5 and AR6 and find that scenarios without specific climate policies enforced have shifted lower in each scenario generation, owing to falling low-carbon technology costs and reduced expectations for economic growth, reducing fossil-fuel shares in energy and industry. Mitigation pathways consistent with 1.5–2°C have seen increasing electrification rates and higher shares of variable renewables in electricity in more recent scenario generations, implying reduced reliance on coal, nuclear, bioenergy and carbon capture and storage, reflecting changing costs. Despite the shrinking carbon budget due to insufficient recent climate action, mitigation costs have not increased given more optimistic low-carbon technology cost projections. Moving forward, scenario producers must continually recalibrate to keep abreast of technology, policy and societal developments to remain policy relevant.

Figure 44. Preview of 'Energy and socioeconomic system transformation through a decade of IPCC-assessed scenarios' in Nature Climate Change

2.45 Kleanthis et al. (2025), Applied Energy

- Title:** Bidirectional soft-linking of a Capacity Expansion Model with a Production Cost Model to evaluate the feasibility of transition pathways towards carbon neutrality in the power sector
- Authors:** Nikos Kleanthis, Vassilis Stavrakas, Alexandros Flamos
- Journal:** Applied Energy
- Abstract:** Energy models have been a valuable tool in support of well-informed decision-making towards the transition to climate neutrality in the European Union. However, considering the extra levels of detail required when designing a system based on intermittent renewables, modelling approaches in the field often lack the necessary time resolution, or are not open source, raising concerns of transparency and scientific reproducibility. This article addresses this gap by introducing a novel bidirectional soft-linking approach between two open-source energy models to generate long-term scenarios in the power sector and evaluate their feasibility, allowing for the optimisation of investments over a 30-year period and the sector's hourly operation at different snapshots. To demonstrate the applicability of this modelling approach, the Greek power sector is used as a testing ground in order to study the capacity and flexibility requirements of different transition pathways by 2050. Simulation outcomes show that a more ambitious variable renewable energy and storage capacity expansion than the one projected by the National Energy and Climate Plan is required to achieve the targets of 2050, while also highlighting a path dependency on gas at least until 2033. The latter could either result in a lock-in effect or to stranded assets if the decision to phase out gas is not taken rapidly. On the other hand, there is the potential to achieve carbon neutrality by 2035, if significant investments take place in time. Finally, switching from natural gas to hydrogen could be an effective solution for new gas power plants to avoid becoming stranded assets.
- Keywords:**
- DOI:** <https://doi.org/10.1016/j.apenergy.2024.124843>
- First Online:** 15 November 2024
- Repository:** Zenodo (Link:)
- Synergies with:** N/A
- Citation (APA):** Kleanthis, N., Stavrakas, V., & Flamos, A. (2025). Bidirectional soft-linking of a Capacity Expansion Model with a Production Cost Model to evaluate the feasibility of transition pathways towards carbon neutrality in the power sector. *Applied Energy*, 378, 124843.

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Applied Energy

Volume 378, Part B, 15 January 2025, 124843



Bidirectional soft-linking of a Capacity Expansion Model with a Production Cost Model to evaluate the feasibility of transition pathways towards carbon neutrality in the power sector

Nikos Kleanthis, Vassilis Stavrakas , Alexandros Flamos[Show more](#) [+ Add to Mendeley](#) [Share](#) [Cite](#)<https://doi.org/10.1016/j.apenergy.2024.124843>[Get rights and content](#) 

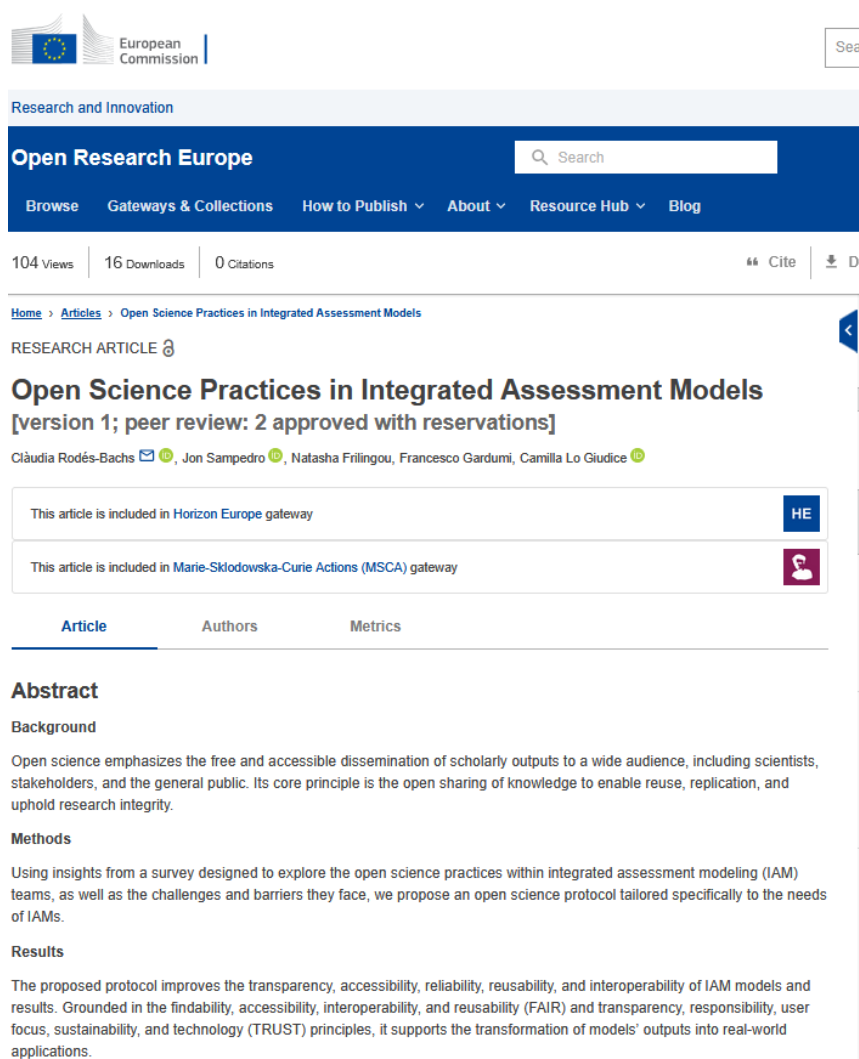
Highlights

- A novel bidirectional soft-linking approach between two open-source energy models.
- Feasibility of alternative transition pathways in the Greek power sector by 2050.
- A green transition in the power sector could result in carbon neutrality by 2035.
- Long-term results demonstrate a path dependency on natural gas at least until 2033.
- Hydrogen deployment can prevent new gas power plants from becoming stranded assets.

Figure 45. Preview of 'Bidirectional soft-linking of a Capacity Expansion Model with a Production Cost Model to evaluate the feasibility of transition pathways towards carbon neutrality in the power sector' in Applied Energy

2.46 Rodés-Bachs et al. (2025), Open Research Europe

Title:	Open Science Practices in Integrated Assessment Models
Authors:	Clàudia Rodés-Bachs, Jon Sampedro, Natasha Frilingou, Francesco Gardumi, Camilla Lo Giudice
Journal:	Open Research Europe
Abstract:	Open science encourages the free sharing of research and data with scientists, policymakers, and the general public, aiming to make knowledge accessible for reuse and further development. To improve the reliability and widespread adoption of these practices, many scientific communities have developed tailored protocols and standardized methods. Integrated assessment models (IAMs), which provide quantitative insights for global environmental change and sustainable development, and feed into major scientific assessments, must be transparent and open to support informed decision-making. Based on a survey of open science practices carried out by different IAM teams, we developed a protocol to address key challenges and overcome existing barriers in the use of open science practices in integrated assessment modelling. This protocol enhances the transparency, accessibility, and reliability of IAMs and their results, fostering greater trust among policymakers and helping to transform model results into real-world applications.
Keywords:	Open science
DOI:	https://doi.org/10.12688/openreseurope.18824.1
First Online:	20 January 25
Repository:	Zenodo (Link:)
Synergies with:	HE DIAMOND (GA: 101081179), GRAPHICS (GA: 101060679)
Citation (APA):	Rodés-Bachs, C., Sampedro, J., Frilingou, N., Gardumi, F., & Giudice, C. L. (2025). Open Science Practices in Integrated Assessment Models. Open Research Europe, 5(12), 12.



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Open Science Practices in Integrated Assessment Models
[version 1; peer review: 2 approved with reservations]

Clàudia Rodés-Bachs, Jon Sampedro, Natasha Frilingou, Francesco Gardumi, Camilla Lo Giudice

This article is included in Horizon Europe gateway

This article is included in Marie-Sklodowska-Curie Actions (MSCA) gateway

Abstract

Background

Open science emphasizes the free and accessible dissemination of scholarly outputs to a wide audience, including scientists, stakeholders, and the general public. Its core principle is the open sharing of knowledge to enable reuse, replication, and uphold research integrity.

Methods

Using insights from a survey designed to explore the open science practices within integrated assessment modeling (IAM) teams, as well as the challenges and barriers they face, we propose an open science protocol tailored specifically to the needs of IAMs.

Results

The proposed protocol improves the transparency, accessibility, reliability, reusability, and interoperability of IAM models and results. Grounded in the findability, accessibility, interoperability, and reusability (FAIR) and transparency, responsibility, user focus, sustainability, and technology (TRUST) principles, it supports the transformation of models' outputs into real-world applications.

Figure 46. Preview of 'Open Science Practices in Integrated Assessment Models' in Open Research Europe

2.47 Pehle et al. (2025), Climatic change

Title:	Regional inequalities in air quality and health co-benefits due to climate change mitigation in the European electricity sector
Authors:	Hannah Pehle, Jan-Philipp Sasse, Evelina Trutnevyte
Journal:	Climatic change
Abstract:	Electricity supply transition to reach carbon neutrality in Europe is expected to bring air quality and health co-benefits, but their regional distribution has not been investigated in detail. This study quantifies these co-benefits for 250 European electricity scenarios in 2035 across 296 sub-national regions. The study links a spatially-explicit electricity sector model with an air quality and health impact model and then accounts for susceptibility and vulnerability of populations to adverse health effects. In case of low-carbon transition, direct PM2.5 concentrations attributable to European electricity generation in 2035 could be reduced by 45–99% compared to a system with the generation capacities of 2018. Depending on the system's make-up, health co-benefits can vary significantly, as does their regional distribution. Focus on the minimum system costs leads to 15 times higher continent-wide excess deaths and to higher regional inequality than the scenario with minimum air pollutant emissions, which would almost entirely eliminate PM2.5-related mortality attributable to electricity generation. The most vulnerable regions (Balkans, Northern Germany, Southeast France, and the West Midlands in England) would benefit from higher air quality co-benefits than the continental average.
Keywords:	Low-carbon electricity supply, Air quality, Health co-benefits, Regional inequalities, Energy justice, Vulnerability framework
DOI:	https://doi.org/10.1007/s10584-024-03851-x
First Online:	03 February 2025
Repository:	Zenodo (Link:)
Synergies with:	N/A
Citation (APA):	Pehle, H., Sasse, JP. & Trutnevyte, E. Regional inequalities in air quality and health co-benefits due to climate change mitigation in the European electricity sector. Climatic Change 178, 27 (2025).

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Regional inequalities in air quality and health co-benefits due to climate change mitigation in the European electricity sector

[Open access](#) | Published: 03 February 2025Volume 178, article number 27, (2025) [Cite this article](#)[Download PDF](#)  You have full access to this [open access](#) article[Hannah Pehle](#) , [Jan-Philipp Sasse](#) & [Evelina Trutnevyte](#) 1330 [Accesses](#)  1 [Citation](#)  4 [Altmetric](#) [Explore all metrics](#) →

Abstract

Electricity supply transition to reach carbon neutrality in Europe is expected to bring air quality and health co-benefits, but their regional distribution has not been investigated in detail. This study quantifies these co-benefits for 250 European electricity scenarios in 2035 across 296 sub-national regions. The study links a spatially-explicit electricity sector model with an air quality and health impact model and then accounts for susceptibility and vulnerability of populations to adverse health effects. In case of low-carbon transition, direct PM_{2.5} concentrations attributable to European electricity generation in 2035 could be reduced by 45–99% compared to a system with the generation capacities of 2018. Depending on the system's make-up, health co-benefits can vary significantly, as does

Figure 47. Preview of 'Regional inequalities in air quality and health co-benefits due to climate change mitigation in the European electricity sector' in Climatic change

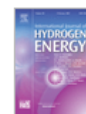
2.48 Alanazi et al. (2025), International Journal of Hydrogen Energy

Title:	Renewable hydrogen trade in a global decarbonised energy system
Authors:	Khalid Alanazi, Shivika Mittal, Adam Hawkes, Nilay Shah
Journal:	International Journal of Hydrogen Energy
Abstract:	Renewable hydrogen has emerged as a potentially critical energy carrier for achieving climate change mitigation goals. International trade could play a key role in meeting hydrogen demand in a globally decarbonised energy system. To better understand this role, we have developed a modelling framework that incorporates hydrogen supply and demand curves and a market equilibrium model to maximize social welfare. Applying this framework, we investigate two scenarios: an unrestricted trade scenario where hydrogen trade is allowed between all regions globally, and a regional independence scenario where trade is restricted to be intra-regional only. Under the unrestricted trade scenario, global hydrogen demand could reach 234 Mt by 2050, with 31.2% met through international trade. Key trade routes identified include North Africa to Europe, the Middle East to Developing Asia, and South America to Japan and South Korea. In the regional independence scenario, most regions could meet their demand domestically, except for Japan and South Korea due to self-insufficiency. Finally, this analysis reveals that producers in North Africa and South America are likely to gain more economic value from international trade compared to other producing regions. The results offer key insights for policymakers and investors for shaping future hydrogen trade policies and investment decisions.
Keywords:	Renewable hydrogen, Hydrogen trade, Energy systems modelling, Hydrogen supply, Hydrogen demand
DOI:	https://doi.org/10.1016/j.ijhydene.2024.12.452
First Online:	03 January 2025
Repository:	Zenodo (Link: https://zenodo.org/records/14608813)
Synergies with:	UK Foreign, Commonwealth & Development Office Climate Compatible Growth (GA: GB-GOV-1-300125)
Citation (APA):	Alanazi, K., Mittal, S., Hawkes, A., & Shah, N. (2025). Renewable hydrogen trade in a global decarbonised energy system. <i>International Journal of Hydrogen Energy</i> , 101, 712-730.

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International Journal of Hydrogen Energy

Volume 101, 3 February 2025, Pages 712-730



Renewable hydrogen trade in a global decarbonised energy system

Khalid Alanazi ^{a, b} , Shivika Mittal ^{a, c}, Adam Hawkes ^a, Nilay Shah ^a[Show more](#) [+ Add to Mendeley](#) [Share](#) [Cite](#)<https://doi.org/10.1016/j.ijhydene.2024.12.452>[Get rights and content](#) Under a Creative Commons [license](#) [Open access](#)

Highlights

- Develop a novel renewable hydrogen trade model with stepwise supply and demand curves.
- Analyze two trade scenarios: unrestricted global trade and regional independence.
- Discuss market equilibrium, trade flows, and other key results for each scenario.
- Provide key insights for shaping future hydrogen market policies and investments.

Figure 48. Preview of 'Renewable hydrogen trade in a global decarbonised energy system' in International Journal of Hydrogen Energy

2.49 Zielonka & Trutnevyte (2025), iScience

Title:	Probabilities of reaching required diffusion of granular energy technologies in European countries
Authors:	Nik Zielonka, Evelina Trutnevyte
Journal:	iScience
Abstract:	To support discussions around the feasibility of the energy transition, we present probabilistic projections of the expected baseline diffusion of solar photovoltaics, wind power, biogases, heat pumps, and low-carbon passenger vehicles in 39 European countries for 2023–2050 under current contextual conditions. We then compare the projected capacities against those required for reaching net-zero greenhouse gas emissions by 2050. We create our projections using 72 different variants of diffusion models that we validate using hindcasting (2012–2022) and weight according to their performance. We find a notable expected growth in solar photovoltaics, heat pumps, and battery electric vehicles in the majority of European countries. However, most countries are unlikely to reach the required capacities for net-zero emissions of wind power and biogases with high confidence, and battery electric vehicles with lower confidence. Probabilities and confidence levels of reaching required capacities of solar photovoltaics and heat pumps vary the most between countries.
Keywords:	
DOI:	https://doi.org/10.1016/j.isci.2025.111825
First Online:	16 January 2025
Repository:	Zenodo (Link:)
Synergies with:	N/A
Citation (APA):	Zielonka, N., & Trutnevyte, E. (2025). Probabilities of reaching required diffusion of granular energy technologies in European countries. <i>iScience</i> , 28(2).

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Probabilities of reaching required diffusion of granular energy technologies in European countries

[Nik Zielonka](#) ^{1,2}  · [Evelina Trutnevite](#)

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Renewable Energy Systems, Institute for Environmental Sciences (ISE), Section of Earth and Environmental Sciences, University of Geneva, Geneva, Switzerland

2 **Lead contact**

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Highlights

- Diffusion of granular energy technologies in Europe is analyzed probabilistically
- A notable growth in solar PV, heat pumps, and electric vehicles is expected
- Most countries will likely miss required capacities of biogases, wind power, and BEVs
- Probabilities of reaching required capacities of solar PV and heat pumps vary the most

Summary

To support discussions around the feasibility of the energy transition, we present probabilistic projections of the expected baseline diffusion of solar photovoltaics, wind power, biogases, heat pumps, and low-carbon passenger vehicles in 39 European countries for 2023–2050 under current contextual conditions. We then compare the projected capacities against those required for reaching net-zero greenhouse gas emissions by 2050. We create our projections using 72 different variants of diffusion models that we validate using hindcasting (2012–2022) and weight according to their performance. We find a notable expected growth in solar photovoltaics, heat pumps, and battery electric vehicles in the majority of European countries. However, most countries are unlikely to reach the required capacities for net-zero emissions of wind power and biogases with high confidence, and battery electric vehicles with lower confidence. Probabilities and confidence levels of reaching required capacities of solar photovoltaics and heat pumps vary the most between countries.

Graphical abstract

Figure 49. Preview of ‘Probabilities of reaching required diffusion of granular energy technologies in European countries’ in iScience

2.50 Al Khourdajie (2025), Nature Climate Change

Title:	Exploring climate futures with deep learning
Authors:	Alaa Al Khourdajie
Journal:	Nature Climate Change
Abstract:	Glancing forward to view alternative futures for limiting global warming requires understanding complex societal–environmental systems that drive future emissions. Now a study explores the potential, and limits, of deep learning to generate core characteristics of these futures.
Keywords:	Databases, Energy modelling, Projection and prediction
DOI:	https://doi.org/10.1038/s41558-025-02350-w
First Online:	13 June 2025
Repository:	Zenodo (Link:)
Synergies with:	N/A
Citation (APA):	Al Khourdajie, A. (2025). Exploring climate futures with deep learning. Nature Climate Change.

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AI and mitigation scenarios

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Glancing forward to view alternative futures for limiting global warming requires understanding complex societal–environmental systems that drive future emissions. Now a study explores the potential, and limits, of deep learning to generate core characteristics of these futures.

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Figure 50. Preview of 'Exploring climate futures with deep learning' in Nature Climate Change

2.51 Bataille et al. (2025), Energy and Climate Change

Title:	Defining 'abated' fossil fuel and industrial process emissions
Authors:	Christopher Bataille, Alaa Al Khourdajie, Heleen de Coninck, Kiane de Kleijne, Lars J. Nilsson, Igor Bashmakov, Steven J. Davis, Paul S. Fennell
Journal:	Energy and Climate Change
Abstract:	There is scientific consensus that limiting warming in line with the Paris Agreement goals requires reaching net zero CO₂ emissions by mid-century and net negative emissions thereafter. Because of the entrenchment of current fossil fuel energy and feedstock demand estimated in almost all global modelled scenarios, 'abated' fossil fuel and industrial process and product use (IPPU) CO₂ emissions, using carbon capture and storage (CCS) technologies to perform carbon management, are likely to be part of any transition. In addition to fossil fuel combustion, this will be primarily in cement & lime kilns, chemical production, and possibly waste incineration and iron and steel making, in processes producing maximally concentrated CO₂ waste streams. Abated fossil fuel and IPPU CO₂ emissions in the context of recent commitments, however, requires consideration of capture rates for fuel processing and end-use, permanence of storage, reduction of upstream production and end-use fugitive methane, and sufficient means to sequester residual emissions. Based on an assessment of evolving CCS technologies in existing sectors and jurisdictions, criteria are proposed for defining a benchmark for 'abated' fossil fuel and IPPU emissions as where near 100 % GHG abatement is to be eventually achieved, with N₂O and fluorinated gases considered separately. This can be accomplished through: 1) CO₂ capture rates of more than or equal to 95 % of CO₂ emitted; 2) permanent storage of captured emissions; 3) reducing upstream and end-use fugitive methane emissions to <0.5 % and towards 0.2 % of gas production & an equivalent for coal; and 4) counterbalancing remaining emissions using permanent carbon dioxide removal. Application of these criteria to just steel and cement yields estimates of more than or equal to 1.37 Gt CO₂ per year reductions after all other reasonable and lower cost actions are taken. At the same time, we acknowledge the value of capture rates below 95 %, so as long they are designed to enable eventual full abatement through process learning. We also discuss commercialisation and deployment policy for CCS, highlighting the need to integrate these criteria into international climate agreements.
Keywords:	CCS, Abated, Definition, Fugitive emissions, Paris agreement, Capture rates, Carbon management
DOI:	https://doi.org/10.1016/j.egycc.2025.100203
First Online:	23 June 2025
Repository:	Zenodo (Link: https://zenodo.org/records/15880541)
Synergies with:	
Citation (APA):	Bataille, C., Al Khourdajie, A., de Coninck, H., de Kleijne, K., Nilsson, L. J., Bashmakov, I., Davis, S. J., & Fennell, P. S. (2025). Defining 'abated' fossil fuel and industrial process emissions. <i>Energy and Climate Change</i> , 6, 100203.



Energy and Climate Change

Volume 6, December 2025, 100203



Full Length Article

Defining ‘abated’ fossil fuel and industrial process emissions

Christopher Bataille ^a , Alaa Al Khourdajie ^b , Heleen de Coninck ^c ,
Kiane de Kleijne ^c , Lars J. Nilsson ^d , Igor Bashmakov ^e , Steven J. Davis ^f ,
Paul S. Fennell ^g

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^c Technology, Innovation and Society Group, Eindhoven University of Technology and Department of Environmental Science, Radboud Institute for Biological and Environmental Sciences, Radboud University, The Netherlands

^d Department of Technology and Society, Lund University, Sweden

^e Centre for Energy Efficiency (CENEF-XXI), Russia

^f Stanford University, USA

^g Department of Chemical Engineering, Imperial College London, United Kingdom

Available online 23 June 2025, Version of Record 14 July 2025.

Figure 51. Preview of ‘Defining ‘abated’ fossil fuel and industrial process emissions’ in Nature Climate Change



3 List of book chapters in peer-reviewed books

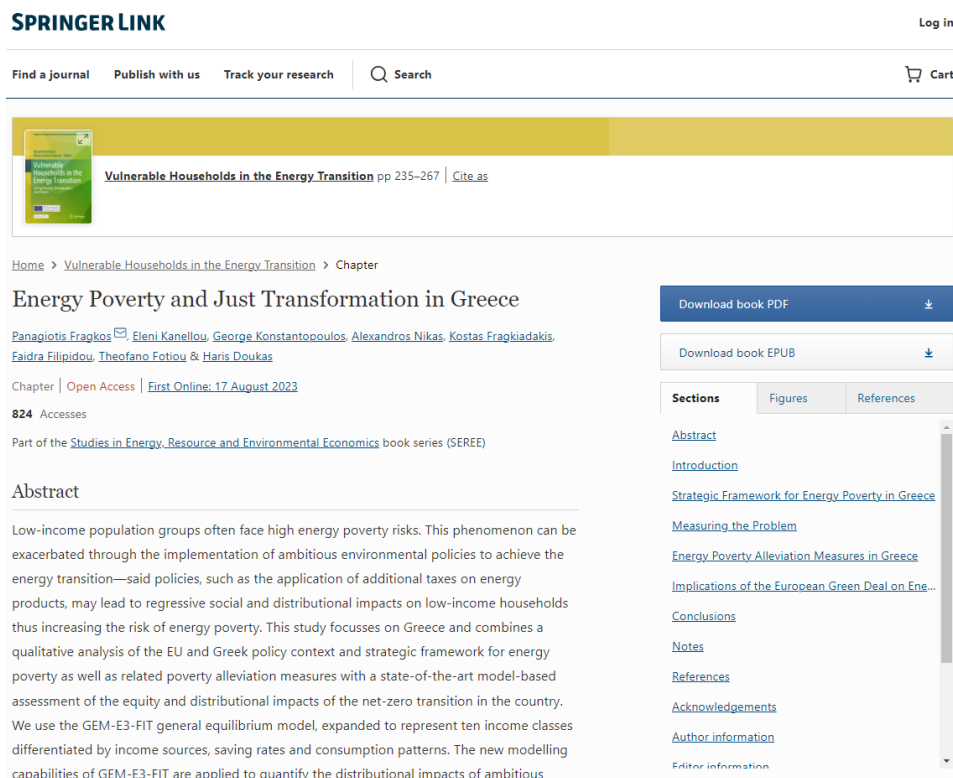
In this section, we report all book chapters⁴ supported by the IAM COMPACT project, mentioning the title, authors (adding the IAM COMPACT partner institutes in parentheses), abstract, and any synergies with other projects funded by the EC or otherwise.

3.1 Fragkos et al. (2023), Studies in Energy, Resource and Environmental Economics

Title:	Energy Poverty and Just Transformation in Greece
Authors:	Panagiotis Fragkos (E3M), Eleni Kanellou (NTUA), George Konstantopoulos (NTUA), Alexandros Nikas (NTUA), Kostas Fragkiadakis (E3M), Faidra Filipidou (E3M), Theofano Fotiou (E3M), Haris Doukas (NTUA)
Book:	Studies in Energy, Resource and Environmental Economics
Abstract:	Low-income population groups often face high energy poverty risks. This phenomenon can be exacerbated through the implementation of ambitious environmental policies to achieve the energy transition—said policies, such as the application of additional taxes on energy products, may lead to regressive social and distributional impacts on low-income households thus increasing the risk of energy poverty. This study focusses on Greece and combines a qualitative analysis of the EU and Greek policy context and strategic framework for energy poverty as well as related poverty alleviation measures with a state-of-the-art model-based assessment of the equity and distributional impacts of the net-zero transition in the country. We use the GEM-E3-FIT general equilibrium model, expanded to represent ten income classes differentiated by income sources, saving rates and consumption patterns. The new modelling capabilities of GEM-E3-FIT are applied to quantify the distributional impacts of ambitious emission reduction targets and at the same time explore their effects on energy-related expenditure and energy poverty by income class in Greece. The country's transition to climate neutrality increases modestly the income inequality across income classes, with low-income households facing the most negative effects. However, using carbon tax revenues as lump-sum transfers to support household income and as reduced social security contributions have the potential to boost employment and scale down income inequality in Greece.
Keywords:	Energy poverty; Greece; just transformation
DOI:	https://doi.org/10.1007/978-3-031-35684-1_10
First Online:	17 August 2023
Repository:	Zenodo (Link: https://zenodo.org/records/10409104)
Synergies with:	H2020 PARIS REINFORCE (GA: 820846), NAVIGATE (GA: 821124), H2020 POWERPOOR (GA: 890437), H2020 ECEMF (GA: 101022622)
Citation (APA):	Fragkos, P., Kanellou, E., Konstantopoulos, G., Nikas, A., Fragkiadakis, K., Filipidou, F., ... &

⁴ <https://iam-compact.eu/publications/scientific-publications>

Doukas, H. (2023). Energy Poverty and Just Transformation in Greece. Vulnerable Households in the Energy Transition, 235.



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Energy Poverty and Just Transformation in Greece

[Panagiotis Fragkos](#) , [Eleni Kanellou](#), [George Konstantopoulos](#), [Alexandros Nikas](#), [Kostas Fragkiadakis](#), [Faidra Filipidou](#), [Theofano Fotiou](#) & [Haris Doukas](#)

Chapter | [Open Access](#) | [First Online: 17 August 2023](#)

824 Accesses

Part of the [Studies in Energy, Resource and Environmental Economics](#) book series (SEREE)

Abstract

Low-income population groups often face high energy poverty risks. This phenomenon can be exacerbated through the implementation of ambitious environmental policies to achieve the energy transition—said policies, such as the application of additional taxes on energy products, may lead to regressive social and distributional impacts on low-income households thus increasing the risk of energy poverty. This study focusses on Greece and combines a qualitative analysis of the EU and Greek policy context and strategic framework for energy poverty as well as related poverty alleviation measures with a state-of-the-art model-based assessment of the equity and distributional impacts of the net-zero transition in the country. We use the GEM-E3-FIT general equilibrium model, expanded to represent ten income classes differentiated by income sources, saving rates and consumption patterns. The new modelling capabilities of GEM-E3-FIT are applied to quantify the distributional impacts of ambitious

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- [Implications of the European Green Deal on Ene...](#)
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Figure 52. Preview of ‘Energy Poverty and Just Transformation in Greece’ in Studies in Energy, Resource and Environmental Economics

4 Conferences

In this section, we report all the conference papers/posters/presentations⁵ presented by IAM COMPACT consortium members, mentioning the title, authors (adding the IAM COMPACT partner institutes in parentheses), abstract, and the venue where the conference took place.

4.1 Van de Ven et al. (2022), Fifteenth Annual Meeting of the Integrated Assessment Modeling Consortium (IAMC), 29 November – 1 December, 2022

Title:	Tracing the transformation through a decade of mitigation scenarios
Type	Presentation
Authors:	Dirk-Jan van de Ven (BC3), Panagiotis Fragkos (E3M), Faidra Filippidou (E3M), Lukas Hermwille (WI), Wolfgang Obergassel (WI), Leon Clarke (UMD), Ajay Gambhir (Imperial), Mikel Gonzalez-Eguino (BC3), Shivika Mittal (Imperial), Alexandros Nikas (NTUA), Glen P. Peters (CICERO), Ida Sognnaes (CICERO)
Abstract:	Presented by Dirk-Jan van de Ven (Basque Centre for Climate Change).
Conference:	Fifteenth Annual Meeting of the Integrated Assessment Modeling Consortium (IAMC)
Date:	29 November – 1 December, 2022
Venue:	Maryland, USA.
Synergies:	H2020 NDC ASPECTS (GA: 101003866)
Citation (APA):	Van de Ven, D.J., Fragkos, P., Filippidou, F., Hermwille, L., Obergassel, W., Clarke, L., Gambhir, A., Gonzalez-Eguino, M., Mittal, S., Nikas, A., Peters, G.P. & Sognnaes, I. (2022). Tracing the transformation through a decade of mitigation scenarios. Fifteenth Annual Meeting of the Integrated Assessment Modeling Consortium (IAMC), November 29 - December 1, 2022, Maryland, USA.

⁵ <https://iam-compact.eu/publications/conferences>

4.2 Van de Ven et al. (2023), GCAM Community Modeling Meeting, 6-8 June, 2023

Title:	"Current Policies" scenario: Implementation in GCAM and open community effort
Type	Presentation
Authors:	Dirk-Jan van de Ven (BC3), Russell Horowitz (BC3), Jon Sampedro (BC3)
Abstract:	Presented by Dirk-Jan van de Ven (Basque Centre for Climate Change).
Conference:	GCAM Community Modeling Meeting
Date:	6-8 June, 2023
Venue:	Virtually
Synergies:	H2020 NDC ASPECTS (GA: 101003866)
Citation (APA):	Van de Ven, D.J., Horowitz, R. & Sampedro, J. (2023). Current Policies scenario: Implementation in GCAM and open community effort. GCAM Community Modeling Meeting, June 6 - 8, 2023, virtually.

4.3 Sampedro et al. (2023), GCAM Community Modeling Meeting, 6-8 June, 2023

Title:	Residential Energy Demand, Emissions, and Expenditures at Regional and Income-decile Level for Alternative Futures
Type	Presentation
Authors:	Jon Sampedro (BC3), Stephanie Waldhoff, Jae Edmonds, Gokul Iyer, Siwa Msangi, Kanishka Narayan, Pralit Patel, Marshall Wise
Abstract:	Presented by Jon Sampedro (Basque Centre for Climate Change).
Conference:	GCAM Community Modeling Meeting
Date:	6-8 June, 2023
Venue:	Virtually
Synergies:	H2020 NDC ASPECTS (GA: 101003866)
Citation (APA):	Sampedro J., Waldhoff, S., Edmonds, J., Iyer, G., Msangi, S., Narayan, K., Pater, P. & Wise, M. (2023). Residential energy demand, emissions, and expenditures at regional and income-decile level for alternative futures. GCAM Community Modeling Meeting, June 6 - 8, 2023, virtually.

4.4 Rodés-Bachs et al. (2023), GCAM Community Modeling Meeting, 6-8 June, 2023

Title:	An R Tool to Process and Standardize GCAM Outputs
Type	Presentation
Authors:	Clàudia Rodés-Bachs (BC3), Jon Sampedro (BC3), Dirk-Jan Van de Ven (BC3), Ryna Yiyun Cui (UMD), Alicia Zhao (UMD), Matthew Zwerling (UMD)
Abstract:	Presented by Clàudia Rodés-Bachs (Basque Centre for Climate Change).
Conference:	GCAM Community Modeling Meeting
Date:	6-8 June, 2023
Venue:	Virtually
Synergies:	N/A
Citation (APA):	Rodés-Bachs, C., Sampedro, J., Van der Ven, D.J., Cui, R.Y., Zhao, A. & Zwerling, M. (2023). gcamreport: An R tool to process and standardize GCAM outputs, GCAM Community Modeling Meeting, June 6 - 8, 2023, virtually.

4.5 Sampedro et al. (2023), Sixteenth Annual Meeting of the Integrated Assessment Modeling Consortium (IAMC), 14-16 November, 2023

Title:	Short-term health co-benefits of existing climate policies: the need for more ambitious and integrated policy action
Type	Presentation
Authors:	Jon Sampedro (BC3) et al.
Abstract:	Presented by Jon Sampedro (Basque Centre for Climate Change).
Conference:	Sixteenth Annual Meeting of the Integrated Assessment Modeling Consortium (IAMC)
Date:	14-16 November, 2023
Venue:	Venice, Italy
Synergies:	N/A
Citation (APA):	J. Sampedro, et. al. (2023). Short-term health co-benefits of existing climate policies: the need for more ambitious and integrated policy action. Sixteenth Annual Meeting of the Integrated Assessment Modeling Consortium (IAMC), November 14 - 16, 2023, Venice, Italy.

4.6 Rodés-Bachs et al. (2023), Sixteenth Annual Meeting of the Integrated Assessment Modeling Consortium (IAMC), 14-16 November 2023

Title:	System-wide co-benefits associated with healthy and sustainable food consumption patterns
Type	Presentation
Authors:	Claudia Rodés-Bachs (BC3) et al.
Abstract:	Presented by Claudia Rodés-Bachs (Basque Centre for Climate Change).
Conference:	Sixteenth Annual Meeting of the Integrated Assessment Modeling Consortium (IAMC)
Date:	14-16 November, 2023
Venue:	Venice, Italy
Synergies:	N/A
Citation (APA):	Rodés-Bachs, C., et. al. (2023). System-wide co-benefits associated with healthy and sustainable food consumption patterns. Sixteenth Annual Meeting of the Integrated Assessment Modeling Consortium (IAMC), November 14 - 16, 2023, Venice, Italy.

4.7 Horowitz et al. (2023), Sixteenth Annual Meeting of the Integrated Assessment Modeling Consortium (IAMC), 14-16 November, 2023

Title:	Modelling Progress towards Emissions Reduction with GCAM Current Policies Database
Type	Presentation
Authors:	Russell Horowitz (BC3) et al.
Abstract:	Presented by Russell Horowitz (Basque Centre for Climate Change).
Conference:	Sixteenth Annual Meeting of the Integrated Assessment Modeling Consortium (IAMC)
Date:	14-16 November, 2023
Venue:	Venice, Italy
Synergies:	N/A
Citation (APA):	R. Horowitz, et. Al. (2023). Modelling Progress towards Emissions Reduction with GCAM Current Policies Database. Sixteenth Annual Meeting of the Integrated Assessment Modeling Consortium (IAMC), November 14 – 16, 2023, Venice, Italy

4.8 Frilingou et al. (2023), European Climate and Energy Modelling Platform 2023 (ECEMP), 5-6 October 2023

Title:	A multi-model assessment of European strategies to eliminate Russian gas imports
Type	Presentation
Authors:	Natasha Frilingou (NTUA), Connal Heussaff (Bruegel), Panagiotis Fragkos (E3M), Shivika Mittal (Imperial), Jon Sampedro (BC3), Sara Giarola (Imperial), Jan-Philipp Sasse (UNIGE), Lorenzo Rinaldi (POLIMI), Haris Doukas (NTUA), Ajay Gambhir (Imperial), Anastasis Giannousakis (E3M), Nicolò Golinucci (POLIMI), Konstantinos Koasidis (NTUA), Matteo Vincenzo Rocco (POLIMI), Evelina Trutnevyte (UNIGE), Georgios Xexakis, Georg Zachmann (Bruegel), Matthew Binsted, Gokul Iyer, Brinda Yarlagadda, Dirk-Jan Van de Ven (BC3), Alexandros Nikas (NTUA)
Abstract:	Presented by Natasha Frilingou (National Technical University of Athens).
Conference:	European Climate and Energy Modelling Platform 2023 (ECEMP)
Date:	5-6 October, 2023
Venue:	Virtually
Synergies:	HE DIAMOND (GA: 101081179)
Citation (APA):	N. Frilingou, C. Heussaff, P. Fragkos, S. Mittal, J. Sampedro, S. Giarola, J.-P. Sasse, L. Rinaldi, H. Doukas, A. Gambhir, A. Giannousakis, N. Golinucci, K. Koasidis, M.V. Rocco, E. Trutnevyte, G. Xexakis, G. Zachmann, M. Binsted, G. Iyer, B. Yarlagadda, D.-J. Van de Ven, & A. Nikas. (2023). A multi-model assessment of European strategies to eliminate Russian gas imports. European Climate and Energy Modelling Platform 2023 (ECEMP), October 5-6, 2023, Online.

4.9 Boitier et al. (2023), European Climate and Energy Modelling Platform 2023 (ECEMP), 5-6 October 2023

Title:	A multi-model assessment of the EU's path to net zero: aligning near-term action with long-term visions
Type	Presentation
Authors:	Baptiste Boitier, Alexandros Nikas (NTUA), Ajay Gambhir (Imperial), Konstantinos Koasidis (NTUA), Alessia Elia, Khaled Al-Dabbas, Şirin Alibaş, Lorenza Campagnolo, Alessandro Chiodi, Elisa Delpiazzi, Haris Doukas (NTUA), Arnaud Fougereyrollas, Maurizio Gargiulo, Pierre Le Mouël, Felix Neuner, Sigit Perdana, Dirk-Jan van de Ven (BC3), Marc Vielle, Paul Zagamé, Shivika Mittal (Imperial)
Abstract:	Presented by Batiste Boitier.
Conference:	European Climate and Energy Modelling Platform 2023 (ECEMP)
Date:	5-6 October, 2023
Venue:	Virtually
Synergies:	HE DIAMOND (GA: 101081179)
Citation (APA):	B. Boitier, A. Nikas, A. Gambhir, K. Koasidis, A. Elia, K. Al-Dabbas, S. Alibaş, L. Campagnolo, A. Chiodi, E. Delpiazzi, H. Doukas, A. Fougereyrollas, M. Gargiulo, P. Le Mouël, F. Neuner, S. Perdana, D.-J. Van de Ven, M. Vielle, P. Zagamé, & S. Mittal. (2023). A multi-model assessment of the EU's path to net zero: aligning near-term action with long-term visions. European Climate and Energy Modelling Platform 2023 (ECEMP), October 5-6, 2023, Online.

4.10 Wachsmuth et al. (2023), Sixteenth Annual Meeting of the Integrated Assessment Modeling Consortium (IAMC), 14-16 November, 2023

Title:	Co-creating socio-technical net-zero scenarios based on IAM scenarios and socio-technical analyses
Type	Presentation
Authors:	Jakob Wachsmuth, Philine Warnke, Ajay Gambhir (Imperial), Sara Giarola (Imperial), Konstantinos Koasidis (NTUA), Shivika Mittal (Imperial), Alexandros Nikas (NTUA), Kathleen Vaillancourt, Haris Doukas (NTUA)
Abstract:	Presented by Jakob Wachsmuth.
Conference:	Sixteenth Annual Meeting of the Integrated Assessment Modeling Consortium (IAMC)
Date:	14-16 November, 2023
Venue:	Venice, Italy
Synergies:	
Citation (APA):	J. Wachsmuth, P. Warnke, A. Gambhir, S. Giarola, K. Koasidis, S. Mittal, A. Nikas, K. Vaillancourt, & H. Doukas. (2023). Co-creating socio-technical net-zero scenarios based on IAM scenarios and socio-technical analyses. Sixteenth Annual Meeting of the Integrated Assessment Modeling Consortium (IAMC), November 14 – 16, 2023, Venice, Italy.

4.11 Nikas et al. (2023), Sixteenth Annual Meeting of the Integrated Assessment Modeling Consortium (IAMC), 14-16 November, 2023

Title:	Three corner options for replacing Russian gas imports in Europe: a multi-model analysis
Type	Presentation
Authors:	Alexandros Nikas (NTUA), Natasha Frilingou (NTUA), Connal Heussaff (Bruegel), Panagiotis Fragkos (E3M), Shivika Mittal (Imperial), Jon Sampedro (BC3), Sara Giarola (Imperial), Jan-Philipp Sasse (UNIGE), Lorenzo Rinaldi, Haris Doukas (NTUA), Ajay Gambhir (Imperial), Anastasis Giannousakis (E3M), Nicolò Golinucci (POLIMI), Konstantinos Koasidis (NTUA), Matteo Vincenzo Rocco (POLIMI), Evelina Trutnevyte (UNIGE), Georgios Xexakis, Georg Zachmann (Bruegel), Matthew Binsted, Gokul Iyer, Brinda Yarlagadda, Dirk-Jan Van de Ven (BC3)
Abstract:	Presented by Alexandros Nikas (National Technical University of Athens).
Conference:	Sixteenth Annual Meeting of the Integrated Assessment Modeling Consortium (IAMC)
Date:	14-16 November, 2023
Venue:	Venice, Italy
Synergies:	HE DIAMOND (GA: 101081179)
Citation (APA):	A. Nikas, N. Frilingou, C. Heussaff, P. Fragkos, S. Mittal, J. Sampedro, S. Giarola, J.-P. Sasse, L. Rinaldi, H. Doukas, A. Gambhir, A. Giannousakis, N. Golinucci, K. Koasidis, M.V. Rocco, E. Trutnevyte, G. Xexakis, G. Zachmann, M. Binsted, G. Iyer, B. Yarlagadda, & D.-J. Van de Ven (2023). Three corner options for replacing Russian gas imports in Europe: a multi-model analysis. Sixteenth Annual Meeting of the Integrated Assessment Modeling Consortium (IAMC), November 14 – 16, 2023, Venice, Italy.

4.12 Boitier et al. (2023), Sixteenth Annual Meeting of the Integrated Assessment Modeling Consortium (IAMC), 14-16 November, 2023

Title:	A multi-model analysis of the EU's path to net zero
Type	Presentation
Authors:	Baptiste Boitier, Alexandros Nikas (NTUA), Ajay Gambhir (Imperial), Konstantinos Koasidis (NTUA), Alessia Elia, Khaled Al-Dabbas, Sirin Alibaş, Lorenza Campagnolo, Alessandro Chiodi, Elisa Delpiazzi, Haris Doukas (NTUA), Arnaud Fougereyrollas, Maurizio Gargiulo, Pierre Le Mouël, Felix Neuner, Sigit Perdana, Dirk-Jan Van de Ven (BC3), Marc Vielle, Paul Zagamé, Shivika Mittal (Imperial)
Abstract:	Presented by Baptiste Boitier
Conference:	Sixteenth Annual Meeting of the Integrated Assessment Modeling Consortium (IAMC)
Date:	14-16 November, 2023
Venue:	Venice, Italy
Synergies:	HE DIAMOND (GA: 101081179)
Citation (APA):	B. Boitier, A. Nikas, A. Gambhir, K. Koasidis, A. Elia, K. Al-Dabbas, S. Alibaş, L. Campagnolo, A. Chiodi, E. Delpiazzi, H. Doukas, A. Fougereyrollas, M. Gargiulo, P. Le Mouël, F. Neuner, S. Perdana, D.-J. Van de Ven, M. Vielle, P. Zagamé, & S. Mittal. (2023). A multi-model analysis of the EU's path to net zero. Sixteenth Annual Meeting of the Integrated Assessment Modeling Consortium (IAMC), November 14 – 16, 2023, Venice, Italy.

4.13 Al Khourdajie et al. (2024), EGU General Assembly 2024, 14-19 April, 2024

Title:	Climate ambition, background scenario or the model? Attribution of the variance of energy-related indicators in global scenarios
Type	Presentation
Authors:	Alaa Al Khourdajie, Jim Skea, Richard Green
Abstract:	Presented by Alaa Al Khourdajie
Conference:	EGU General Assembly 2024
Date:	14-19 April, 2024
Venue:	Vienna, Austria
Synergies:	
Citation (APA):	Al Khourdajie, A., Skea, J., and Green, R.: Climate ambition, background scenario or the model? Attribution of the variance of energy-related indicators in global scenarios, EGU General Assembly 2024, Vienna, Austria, 14–19 Apr 2024, EGU24-656, https://doi.org/10.5194/egusphere-egu24-656 , 2024.

4.14 García-Muros et al. (2024), EGU General Assembly 2024, 14-19 April, 2024

Title:	Can energy and environmental taxation be progressive in the EU?
Type	Presentation
Authors:	Xaquín García-Muros, Eva Alonso-Epelde, Mikel González-Eguino, Alejandro Rodríguez-Zúñiga
Abstract:	Presented by Xaquín García-Muros
Conference:	EGU General Assembly 2024
Date:	14-19 April, 2024
Venue:	Vienna, Austria
Synergies:	
Citation (APA):	García-Muros, X., Alonso-Epelde, E., González-Eguino, M., and Rodríguez-Zúñiga, A.: Can energy and environmental taxation be progressive in the EU?, EGU General Assembly 2024, Vienna, Austria, 14–19 Apr 2024, EGU24-10785, https://doi.org/10.5194/egusphere-egu24-10785 , 2024

4.15 Frilingou et al. (2024), EGU General Assembly 2024, 14-19 April, 2024

Title:	How do interest rates affect decarbonisation pathways? A stakeholder-driven multi-model analysis.
Type	Presentation
Authors:	Natasha Frilingou, Dirk-Jan van de Ven, Shivika Mittal, Anastasios Karamaneas, Thomas Nikolakakis, Francesco Gardumi, Konstantinos Koasidis, Alexandros Nikas
Abstract:	Presented by Natasha Frilingou
Conference:	EGU General Assembly 2024
Date:	14-19 April, 2024
Venue:	Vienna, Austria
Synergies:	
Citation (APA):	Frilingou, N., van de Ven, D.-J., Mittal, S., Anastasios, K., Nikolakakis, T., Gardumi, F., Koasidis, K., and Nikas, A.: How do interest rates affect decarbonisation pathways? A stakeholder-driven multi-model analysis., EGU General Assembly 2024, Vienna, Austria, 14–19 Apr 2024, EGU24-17148, https://doi.org/10.5194/egusphere-egu24-17148 , 2024.

4.16 Van de Ven & Sampedro (2024), EGU General Assembly 2024, 14-19 April, 2024

Title:	Passenger transport decarbonisation under different equity considerations
Type	Presentation
Authors:	Dirk-Jan Van de Ven, Jon Sampedro
Abstract:	Presented by Dirk-Jan Van de Ven
Conference:	EGU General Assembly 2024
Date:	14-19 April, 2024
Venue:	Vienna, Austria
Synergies:	HE DIAMOND (GA: 101081179)
Citation (APA):	Van de Ven, D.-J. and Sampedro, J.: Passenger transport decarbonisation under different equity considerations, EGU General Assembly 2024, Vienna, Austria, 14–19 Apr 2024, EGU24-19615, https://doi.org/10.5194/egusphere-egu24-19615 , 2024.

4.17 Alonso-Epelde et al. (2024), EGU General Assembly 2024, 14-19 April, 2024

Title:	MEDUSA - Modelling Equity and DistribUtional impacts for Socioeconomic Analysis
Type	Presentation
Authors:	Eva Alonso-Epelde, Clàudia Rodés, María Moyano-Reina
Abstract:	Presented by Eva Alonso-Epelde
Conference:	EGU General Assembly 2024
Date:	14-19 April, 2024
Venue:	Vienna, Austria
Synergies:	
Citation (APA):	Alonso-Epelde, E., Rodés, C., and Moyano-Reina, M.: MEDUSA - Modelling Equity and DistribUtional impacts for Socioeconomic Analysis, EGU General Assembly 2024, Vienna, Austria, 14–19 Apr 2024, EGU24-5065, https://doi.org/10.5194/egusphere-egu24-5065 , 2024.

4.18 Rodés-Bachs et al. (2024), GCAM Community Modeling Meeting, 5-6 June, 2024

Title:	gcamreport: An R tool to process and standardize GCAM outputs
Type	Presentation
Authors:	Clàudia Rodés-Bachs, Jon Sampedro, Russell Horowitz, Dirk-Jan Van de Ven, Ryna Yiyun Cui, Alicia Zhao, Matthew Zwerling, and Zarrar Khan
Abstract:	Presented by Clàudia Rodés-Bachs
Conference:	GCAM Community Modeling Meeting
Date:	5-6 June, 2024
Venue:	online
Synergies:	
Citation (APA):	 Rodés-Bachs, C., et al. (2024). gcamreport: An R tool to process and standardize GCAM outputs, GCAM Community Modeling Meeting, June 5 - 6, 2024, virtually.

4.19 Horowitz et al. (2024), GCAM Community Modeling Meeting, 5-6 June, 2024

Title:	The role of a carbon border adjustment mechanism in steel decarbonization
Type	Presentation
Authors:	Russell Horowitz
Abstract:	Presented by Russell Horowitz
Conference:	GCAM Community Modeling Meeting
Date:	5-6 June, 2024
Venue:	online
Synergies:	
Citation (APA):	Horowitz, R., et al. (2024). The role of a carbon border adjustment mechanism in steel decarbonization, GCAM Community Modeling Meeting, June 5 - 6, 2024, virtually.

4.20 Rodés-Bachs et al. (2024), AEEE (Asociación Española para la Economía Energética), 6-7 June, 2024

Title:	Analyzing the trade-offs of sustainable diets on the long-term SDG goals
Type	Presentation
Authors:	Clàudia Rodés-Bachs, Jon Sampedro, Dirk-Jan van de Ven, Russell Horowitz, Guillermo Pardo, and Xin Zhao
Abstract:	Presented by Clàudia Rodés-Bachs
Conference:	AEEE (Asociación Española para la Economía Energética)
Date:	6-7 June, 2024
Venue:	Granda, Spain
Synergies:	
Citation (APA):	 Rodés-Bachs, C., et al. (2024). Analyzing the trade-offs of sustainable diets on the long-term SDG goals, AEEE (Asociación Española para la Economía Energética), June 6-7, Granada, 2024

4.21 Frilingou et al. (2024), Seventeenth Annual Meeting of the Integrated Assessment Modeling Consortium (IAMC), 4-6 November, 2024

Title:	How do interest rates affect decarbonisation pathways? A stakeholder-driven modelling analysis
Type	Presentation
Authors:	Natasha Frilingou, Dirk-Jan van de Ven, Shivika Mittal, Konstantinos Koasidis, Charalampros Platias, Haris Doukas, Alexandros Nikas
Abstract:	
Conference:	Seventeenth Annual Meeting of the Integrated Assessment Modeling Consortium (IAMC)
Date:	4-6 November, 2024
Venue:	Seoul, South Korea
Synergies:	HE DIAMOND (GA: 101081179)
Citation (APA):	Frilingou, N., Van de Ven, D.-J., Mittal, S., Koasidis, K., Platias, C., Doukas, H., Nikas, A., How do interest rates affect decarbonisation pathways? A stakeholder-driven modelling analysis, Seventeenth Annual Meeting of the Integrated Assessment Modeling Consortium (IAMC), November 4 - 6, 2024, Seoul, South Korea.

4.22 Koasidis et al. (2024), Seventeenth Annual Meeting of the Integrated Assessment Modeling Consortium (IAMC), 4-6 November, 2024

Title:	A new approach to optimising progress in non-climate sustainability indicators associated with varying sectoral mitigation efforts for different carbon budgets
Type	Presentation
Authors:	Konstantinos Koasidis, Natasha Frilingou, Dirk-Jan Van de Ven, George Xexakis, Jon Sampedro, Clàudia Rodés Bachs, Theo Rouhette, Russell Horowitz, Christos Petkidis, Charalambos Platias, Alexandros Nikas
Abstract:	Presented by Konstantinos Koasidis
Conference:	Seventeenth Annual Meeting of the Integrated Assessment Modeling Consortium (IAMC)
Date:	4-6 November, 2024
Venue:	Seoul, South Korea
Synergies:	HE DIAMOND (GA: 101081179)
Citation (APA):	Koasidis, K., Frilingou, N., Van de Ven, D.-J., Xexakis, G., Sampedro, J., Rodés Bachs, C., Rouhette, T., Horowitz, R., Petkidis, C., Platias, C., Nikas, A., A new approach to optimising progress in non-climate sustainability indicators associated with varying sectoral mitigation efforts for different carbon budgets, Seventeenth Annual Meeting of the Integrated Assessment Modeling Consortium (IAMC), November 4 - 6, 2024, Seoul, South Korea.

4.23 van de Ven et al. (2024), Seventeenth Annual Meeting of the Integrated Assessment Modeling Consortium (IAMC), 4-6 November, 2024

Title:	Optimising sectoral contributions for Paris-compatible emission budgets over multiple SDG trade-offs
Type	Presentation
Authors:	Dirk-Jan Van de Ven, Jon Sampedro, Clàudia Rodés Bachs, Theo Rouhette, Russell Horowitz, Konstantinos Koasidis, Natasha Frilingou, Alexandros Nikas
Abstract:	Presneted by Dirk-Jan Van de Ven
Conference:	Seventeenth Annual Meeting of the Integrated Assessment Modeling Consortium (IAMC)
Date:	4-6 November, 2024
Venue:	Seoul, South Korea
Synergies:	H2020 NDC ASPECTS (GA: 101003866)
Citation (APA):	van de Ven, D.J., Sampedro., J., Rodés Bachs, C., Rouhette, T., Horowitz., R., Koasidis, K., Frilingou., N., Nikas, A., Optimising sectoral contributions for Paris-compatible emission budgets over multiple SDG trade-offs, Seventeenth Annual Meeting of the Integrated Assessment Modeling Consortium (IAMC), November 4 - 6, 2024, Seoul, South Korea

4.24 Jayasuriya et al. (2024), Seventeenth Annual Meeting of the Integrated Assessment Modeling Consortium (IAMC), 4-6 November, 2024

Title:	A CLEWs assessment of land-use implications of sectoral climate policy in Sri Lanka
Type	Presentation
Authors:	Lahiru Jayasuriya, Francesco Gardumi, Natasha Frilingou, Alexandros Nikas
Abstract:	Presented by Lahiru Jayasuriya
Conference:	Seventeenth Annual Meeting of the Integrated Assessment Modeling Consortium (IAMC)
Date:	4-6 November, 2024
Venue:	Seoul, South Korea
Synergies:	
Citation (APA):	Jayasuriya, L., Gardumi, F., Frilingou, N., Nikas, A., A CLEWs assessment of land-use implications of sectoral climate policy in Sri Lanka, Seventeenth Annual Meeting of the Integrated Assessment Modeling Consortium (IAMC), November 4 - 6, 2024, Seoul, South Korea

4.25 Heussaff et al. (2024), Seventeenth Annual Meeting of the Integrated Assessment Modeling Consortium (IAMC), 4-6 November, 2024

Title:	Advancing participatory integrated assessment modelling via a Policy Response Mechanism: a novel approach to policy-relevant, stakeholder-driven modelling
Type	Presentation
Authors:	Conall Heussaff, Natasha Frilingou, Adrian Lauer, Ugne Keliauskaite, Georg Zachmann, Panagiotis Fragkos, Eleftheria Zisarou, Dirk-Jan van de Ven, Russell Horowitz, Xaquín García-Murosa, Rasmus M. Johannsen, Jakob Z. Thellufsen, Georg Holtz, Alexander Jülich, Shivika Mittal, Glen P. Peters, Jan Ivar Korsbakken, Alaa Al Khourdajie, Sara Giarola, Adam Hawkes, Jaime Nieto, Mohamed Lifi, Gonzalo Parrado Hernando, Clàudia Rodés Bachs, Konstantinos Koasidis, Vassilis Stavrakas, Nikos Kleanthis, Alexandros Flamos, Charalampos Platias, Lorenzo Rinaldi, Matteo V. Rocco, Ilkka Keppo, Alexandros Nikas
Abstract:	Presented by Alexandros Nikas
Conference:	Seventeenth Annual Meeting of the Integrated Assessment Modeling Consortium (IAMC)
Date:	4-6 November, 2024
Venue:	Seoul, South Korea
Synergies:	
Citation (APA):	Heussaff, C., Frilingou, N., Lauer, A, Keliauskaite, U., Zachmann, G., Fragkos, P., Zisarou, E., van de Ven, Dirk-Jan, Horowitz, R., García-Murosa, X., Johannsen, R. M., Thellufsen, J. Z., Holtz, G., Jülich, A., Mittal, S., Peters, G. P., Korsbakken, J. I., Al Khourdajie, A., Giarola, S., Hawkes, A., Nieto, J., Lifi, M., Hernando, G. P., Rodés Bachs, C., Koasidis, K., Stavrakas, V., Kleanthis, N., Flamos, A., Platias, Ch., Rinaldi, L., Rocco, M. V., Keppo, I., Nikas, A. Advancing participatory integrated assessment modelling via a Policy Response Mechanism: a novel approach to policy-relevant, stakeholder-driven modelling, Seventeenth Annual Meeting of the Integrated Assessment Modeling Consortium (IAMC), November 4 - 6, 2023, Seoul, South Korea

4.26 Al Khourdajie et al. (2024), Seventeenth Annual Meeting of the Integrated Assessment Modeling Consortium (IAMC), 4-6 November, 2024

Title:	Navigating the unexpected: The impact of disruptive events on mitigation scenarios
Type	Presentation
Authors:	Alaa Al Khourdajie, Shivika Mittal, Ajay Gambhir, Dirk-Jan Van de Ven, Panagiotis Fragkos, Alexandros Nikas, Glen P Peters, Natasha Frilingou, David McCollum, Eleftheria Zisarou, Lorenzo Rinaldi, Jaime Nieto Vega, Adam Hawkes
Abstract:	Presneted by Alaa Al Khourdajie
Conference:	Seventeenth Annual Meeting of the Integrated Assessment Modeling Consortium (IAMC)
Date:	4-6 November, 2024
Venue:	Seoul, South Korea
Synergies:	
Citation (APA):	Al Khourdajie, A., Mittal, S., Gambhir, A., Van de Ven, D-J., Fragkos, P., Nikas, A., Peters, G., Frilingou, N., McCollum, D.L., Zisarou, E., Rinaldi, L., Nieto Vega J., Hawkes, A. Navigating the unexpected: The impact of disruptive events on mitigation scenarios, Seventeenth Annual Meeting of the Integrated Assessment Modeling Consortium (IAMC), November 4 - 6, 2024, Seoul, South Korea

4.27 Boespflug et al. (2024), Seventeenth Annual Meeting of the Integrated Assessment Modeling Consortium (IAMC), 4-6 November, 2024

Title:	Enhancing CLEW Model for Ethiopia: long-term energy analysis and impacts
Type	Presentation
Authors:	Claire Boespflug, Francesco Gardumi, Pegah Atarian, Alexandros Nikas
Abstract:	Presented by Alexandros Nikas
Conference:	Seventeenth Annual Meeting of the Integrated Assessment Modeling Consortium (IAMC)
Date:	4-6 November, 2024
Venue:	Seoul, South Korea
Synergies:	
Citation (APA):	Boespflug, C., Gardumi, F., Atariana, P., Nikas., A, Enhancing CLEW Model for Ethiopia: long-term energy analysis and impacts, Seventeenth Annual Meeting of the Integrated Assessment Modeling Consortium (IAMC), November 4 - 6, 2024, Seoul, South Korea

4.28 Kleanthis et al. (2024), Seventeenth Annual Meeting of the Integrated Assessment Modeling Consortium (IAMC), 4-6 November, 2024

Title:	Combining “people-centred” storylines based on social innovations of energy citizenship with narratives of potential “future-world” evolutions towards transformative scenario design
Type	Presentation
Authors:	Nikos Kleanthis, Vassilis Stavrakas, Nicole van den Berg, Dimitris Fotopoulos, BinBin Pearce, Detlef P. van Vuuren, Alexandros Flamos
Abstract:	Presented by Nikos Kleanthis
Conference:	Seventeenth Annual Meeting of the Integrated Assessment Modeling Consortium (IAMC)
Date:	4-6 November, 2024
Venue:	Seoul, South Korea
Synergies:	H2020 ENCLUDE (GA: 101022791)
Citation (APA):	Kleanthis, N., Stavrakas, V., van den Berg, N. J., Fotopoulos, D., Pearce, B. J., van Vuuren, D. P., & Flamos, A., Combining “people-centred” storylines based on social innovations of energy citizenship with narratives of potential “future-world” evolutions towards transformative scenario design, Seventeenth Annual Meeting of the Integrated Assessment Modeling Consortium (IAMC), November 4 - 6, 2024, Seoul, South Korea.

4.29 Stavrakas et al. (2024), Seventeenth Annual Meeting of the Integrated Assessment Modeling Consortium (IAMC), 4-6 November, 2024

Title:	Green transition reforms in Greece: Evaluating the effectiveness of the National Recovery and Resilience Plan towards the achievement of national determined contributions and net-zero targets
Type	Presentation
Authors:	Vassilis Stavrakas, Nikos Kleanthis, Dimitris Papantonis, Alexandros Flamos
Abstract:	Presented by Alexandros Flamos
Conference:	Seventeenth Annual Meeting of the Integrated Assessment Modeling Consortium (IAMC)
Date:	4-6 November, 2024
Venue:	Seoul, South Korea
Synergies:	ENCLUDE (GA: 101022791)
Citation (APA):	Stavrakas, V., Kleanthis, N., Papantonis, D., Flamos, A., Green transition reforms in Greece: Evaluating the effectiveness of the National Recovery and Resilience Plan towards the achievement of national determined contributions and net-zero targets, Seventeenth Annual Meeting of the Integrated Assessment Modeling Consortium (IAMC), November 4 - 6, 2024, Seoul, South Korea.

4.30 van den Berg et al. (2024), Seventeenth Annual Meeting of the Integrated Assessment Modeling Consortium (IAMC), 4-6 November, 2024

Title:	Decarbonisation Pathways of Energy Citizenship: How can citizens contribute to the energy system in different ways and their impacts
Type	Presentation
Authors:	Nicole van den Berg, Nikos Kleanthis, Dimitris Fotopoulos, Vassilis Stavarakas, Detlef P. van Vuuren
Abstract:	Presented by Vassilis Stavarakas
Conference:	Seventeenth Annual Meeting of the Integrated Assessment Modeling Consortium (IAMC)
Date:	4-6 November, 2024
Venue:	Seoul, South Korea
Synergies:	ENCLUDE (GA: 101022791)
Citation (APA):	van den Berg, N. J., Kleanthis, N., Fotopoulos, D., Stavarakas, V., van Vuuren, D. P., Decarbonisation Pathways of Energy Citizenship: How can citizens contribute to the energy system in different ways and their impacts, Seventeenth Annual Meeting of the Integrated Assessment Modeling Consortium (IAMC), November 4 - 6, 2024, Seoul, South Korea.

4.31 Fragkos et al. (2024), Seventeenth Annual Meeting of the Integrated Assessment Modeling Consortium (IAMC), 4-6 November, 2024

Title:	Economic and Environmental Effects of Industrial Policy Nationalism
Type	Presentation
Authors:	Panagiotis Fragkos, Lukas Hermwille, Kostas Fragkiadakis, Dimitris Fragkiadakis, Maria-Iro Baka
Abstract:	Presented by Panagiotis Fragkos
Conference:	Seventeenth Annual Meeting of the Integrated Assessment Modeling Consortium (IAMC)
Date:	4-6 November, 2024
Venue:	Seoul, South Korea
Synergies:	H2020 NDC ASPECTS (GA: 101003866), HE TRANSIENCE (GA: 101137606)
Citation (APA):	Fragkos, P., Hermwille, L., Fragkiadakis, K., Fragkiadakis, D., Baka, M., Economic and Environmental Effects of Industrial Policy Nationalism, Seventeenth Annual Meeting of the Integrated Assessment Modeling Consortium (IAMC), November 4 - 6, 2024, Seoul, South Korea.

4.32 Maheshwari et al. (2024), Seventeenth Annual Meeting of the Integrated Assessment Modeling Consortium (IAMC), 4-6 November, 2024

Title:	An Accounting Framework for Implementing India's NDC using Key Policy Analysis
Type	Presentation
Authors:	Jyoti Maheshwari, Debasish Prusty, Amit Garg
Abstract:	Presented by Jyoti Maheshwari
Conference:	Seventeenth Annual Meeting of the Integrated Assessment Modeling Consortium (IAMC)
Date:	4-6 November, 2024
Venue:	Seoul, South Korea
Synergies:	
Citation (APA):	Maheshwari J., Prusty, D., and Garg. A., An Accounting Framework for Implementing India's NDC using Key Policy Analysis, Seventeenth Annual Meeting of the Integrated Modeling Consortium (IAMC), November 4 - 6, 2024, Seoul, South Korea.

4.33 Al Khourdajie et al. (2024), American Geophysical Union (AGU), 9-13 December, 2024

Title:	Navigating the unexpected: The impact of disruptive events on mitigation scenarios
Type	Presentation
Authors:	Alaa Al Khourdajie, Shivika Mittal, Ajay Gambhir, Dirk-Jan van de Ven, Panagiotis Fragkos, Alexandros Nikas, Glen Peters, Natasha Frilingou, David L. McCollum, Eleftheria Zisarou, Lorenzo Rinaldi, Jaime Nieto Vega, Adam Hawkes
Abstract:	Presented by Alaa Al Khourdajie
Conference:	American Geophysical Union (AGU)
Date:	9-13 December, 2024
Venue:	Washington, D.C.
Synergies:	
Citation (APA):	Al Khourdajie, A., Mittal, S., Gambhir, A., van de Ven, D-J., Fragkos, P., Nikas, A., Peters, G., Frilingou, N., McCollum, D.L., Zisarou, E., Rinaldi, L., Nieto Vega J., Hawkes, A., Navigating the unexpected: The impact of disruptive events on mitigation scenarios, American Geophysical Union (AGU), December 9-13, 2024, Washington, D.C.

4.34 Al Khourdajie et al. (2024), European Climate and Energy Modelling Forum (ECEMP), 16-17 October, 2024

Title:	Navigating the unexpected: The impact of disruptive events on mitigation scenarios
Type	Presentation
Authors:	Alaa Al Khourdajie, Shivika Mittal, Dirk-Jan Van de Ven, Panagiotis Fragkos, Alexandros Nikas, Glen Peters, Natasha Frilingou, David L. McCollum, Eleftheria Zisarou, Lorenzo Rinaldi, Jaime Nieto Vega, Adam Hawkes
Abstract:	Presented by Alaa Al Khourdajie
Conference:	European Climate and Energy Modelling Forum (ECEMP)
Date:	16-17 October, 2024
Venue:	Brussels and online
Synergies:	
Citation (APA):	Al Khourdajie, A., Mittal, S., Gambhir, A., van de Ven, D-J., Fragkos, P., Nikas, A., Peters, G., Frilingou, N., McCollum, D.L., Zisarou, E., Rinaldi, L., Nieto Vega J., Hawkes, A., Navigating the unexpected: The impact of disruptive events on mitigation scenarios, European Climate and Energy Modelling Forum (ECEMP), October 16-17, 2024, Brussels and online.

4.35 Kleanthis et al. (2024), European Climate and Energy Modelling Forum (ECEMP), 16-17 October, 2024

Title:	Combining long-term capacity planning with flexibility assessment to explore decarbonisation pathways in the power sector
Type	Presentation
Authors:	Nikos Kleanthis, Vassilis Stavrakas, Alexandros Flamos
Abstract:	Presented by Nikos Kleanthis
Conference:	European Climate and Energy Modelling Forum (ECEMP)
Date:	16-17 October, 2024
Venue:	Brussels and online
Synergies:	
Citation (APA):	Kleanthis, N., Stavrakas, V., & Flamos, A. Combining long-term capacity planning with flexibility assessment to explore decarbonisation pathways in the power sector, European Climate and Energy Modelling Forum (ECEMP), October 16-17, 2024, Brussels and online.

4.36 Heussaff et al. (2024), European Climate and Energy Modelling Forum (ECEMP), 16-17 October, 2024

Title:	Advancing participatory integrated assessment modelling via a Policy Response Mechanism: a novel approach to policy-relevant, stakeholder-driven modelling
Type	Presentation
Authors:	Conall Heussaff, Natasha Frilingou, Adrian Lauer, Ugne Keliauskaite, Georg Zachmann, Panagiotis Fragkos, Eleftheria Zisarou, Dirk-Jan van de Ven, Russell Horowitz, Xaquín García-Muros, Rasmus M. Johannsen, Jakob Z. Thellufsen, Georg Holtz, Alexander Jülich, Shivika Mittal, Glen P. Peters, Jan Ivar Korsbakken, Alaa Al Khourdajie, Sara Giarola, Adam Hawkes, Jaime Nieto, Mohamed Lifi, Gonzalo Parrado Hernando, Clàudia Rodés Bachs, Konstantinos Koasidis, Vassilis Stavrakas, Nikos Kleanthis, Alexandros Flamos, Charalampos Platias, Lorenzo Rinaldi, Matteo V. Rocco, Ilkka Keppo, Alexandros Nikas
Abstract:	Presented by Conall Heussaff
Conference:	European Climate and Energy Modelling Forum (ECEMP)
Date:	16-17 October, 2024
Venue:	Brussels and online
Synergies:	
Citation (APA):	Heussaff, C., Frilingou, N., Lauer, A, Keliauskaite, U., Zachmann, G., Fragkos, P., Zisarou, E., van de Ven, Dirk-Jan, Horowitz, R., García-Murosa, X., Johannsen, R. M., Thellufsen, J. Z., Holtz, G., Jülich, A., Mittal, S., Peters, G. P., Korsbakken, J. I., Al Khourdajie, A., Giarola, S., Hawkes, A., Nieto, J., Lifi, M., Hernando, G. P., Rodés Bachs, C., Koasidis, K., Stavrakas, V., Kleanthis, N., Flamos, A., Platias, Ch., Rinaldi, L., Rocco, M. V., Keppo, I., Nikas, A. Advancing participatory integrated assessment modelling via a Policy Response Mechanism: a novel approach to policy-relevant, stakeholder-driven modelling, European Climate and Energy Modelling Forum (ECEMP), October 16-17, 2024, Brussels and online.

4.37 Korsbakken (2024), European Climate and Energy Modelling Forum (ECEMP), 16-17 October, 2024

Title:	A tool for validation and vetting of model results in IAM COMPACT
Type	Presentation
Authors:	Jan Ivar Korsbakken
Abstract:	Presented by Jan Ivar Korsbakken
Conference:	European Climate and Energy Modelling Forum (ECEMP)
Date:	16-17 October, 2024
Venue:	Brussels and online
Synergies:	
Citation (APA):	Korsbakken, J. V., A tool for validation and vetting of model results in IAM COMPACT, Seventeenth Annual Meeting of the Integrated Assessment Modeling Consortium (IAMC), November 4 - 6, 2024, Seoul, South Korea.

4.38 Frilingou et al. (2025), EGU General Assembly 2025, 27 Apr–2 May, 2025

Title:	Comparing cost-optimal to policy-driven scenarios for a decarbonised European energy system
Type	Presentation
Authors:	Natasha Frilingou, Dirk-Jan van de Ven, Russell Horowitz, Clàudia Rodés Bachs, Shivika Mittal, Alexandre Torne, Evelina Trutnevyte, Konstantinos Koasidis, Alexandros Nikas
Abstract:	Presented by Natasha Frilingou
Conference:	EGU General Assembly 2025
Date:	27 Apr–2 May, 2025
Venue:	Vienna, Austria
Synergies:	HE DIAMOND (GA: 101081179)
Citation (APA):	Frilingou, N., Van de Ven, D.-J., Horowitz, R., Rodés Bachs, C., Mittal, S., Torne, A., Trutnevyte, E., Koasidis, K., and Nikas, A.: Comparing cost-optimal to policy-driven scenarios for a decarbonised European energy system, EGU General Assembly 2025, Vienna, Austria, 27 Apr–2 May 2025, EGU25-19690, https://doi.org/10.5194/egusphere-egu25-19690 , 2025.

4.39 Al Khourdajie et al. (2025), EGU General Assembly 2025, 27 Apr–2 May, 2025

Title:	Navigating the unexpected: The impact of disruptive events on mitigation scenarios
Type	Presentation
Authors:	Alaa Al Khourdajie, Alexandros Nikas, Natasha Frilingou, Shivika Mittal, Dirk Jan van de Ven, Panagiotis Fragkos, Haewon McJeon, Ed Byers, Ilkka Keppo, Glen Peters, David McCollum, Eleftheria Zisarou, Adam Hawkes, Ajay Gambhir
Abstract:	Presented by Alaa Al Khourdajie
Conference:	EGU General Assembly 2025
Date:	27 Apr–2 May, 2025
Venue:	Vienna, Austria
Synergies:	
Citation (APA):	Al Khourdajie, A., Nikas, A., Frilingou, N., Mittal, S., van de Ven, D. J., Fragkos, P., McJeon, H., Byers, E., Keppo, I., Peters, G., McCollum, D., Zisarou, E., Hawkes, A., and Gambhir, A.: Navigating the unexpected: The impact of disruptive events on mitigation scenarios, EGU General Assembly 2025, Vienna, Austria, 27 Apr–2 May 2025, EGU25-6022, https://doi.org/10.5194/egusphere-egu25-6022 , 2025.

4.40 Nikas et al. (2025), 34th European Conference on Operational Research, 22-25 June, 2025

Title:	Optimising sectoral climate mitigation efforts against multiple sustainability indicators: a multi-objective integrated assessment
Type	Presentation
Authors:	Alexandros Nikas, Dirk-Jan van de Ven, Clàudia Rodés Bachs, Theo Rouhette, Russell Horowitz, Jon Sampedro, Natasha Frilingou, Kimon Georgiou, Xin Zhao, Abhishek Chaudhary, Konstantinos Koasidis
Abstract:	Presented by Alexandros Nikas
Conference:	34th European Conference on Operational Research
Date:	22-25 June, 2025
Venue:	Leeds, United Kingdom
Synergies:	
Citation (APA):	Nikas, A., Van de Ven, D.-J., Rodes-Bachs, C., Rouhette, T., Horowitz, R., Sampedro, J., Frilingou, N., Georgiou, K., Zhao, X., Chaudhary, A., Koasidis, K. Optimising sectoral climate mitigation efforts against multiple sustainability indicators: a multi-objective integrated assessment, 34th European Conference on Operational Research, June 22-25, 2025, Leeds, United Kingdom

4.41 Frilingou et al. (2025), SSH Energy Workshop 2024 – Futuring inter- and transdisciplinary energy research, for whom, by whom?, 16-17 June, 2025

Title:	Advancing participatory integrated assessment modelling via a Policy Response Mechanism: a novel approach to policy-relevant, stakeholder-driven modelling
Type	Presentation
Authors:	Natasha Frilingou, Conall Heusaff, Georg Zachmann, Shivika Mittal, Dirk-Jan van de Ven, Russell Horowitz, Clàudia-Rodés Bachs, Xaquín García-Murosa, Alaa Al Khourdajie, Rasmus M. Johannsen, Jakob Z. Thellufsen, Panagiotis Fragkos, Eleftheria Zisarou, Nathalie Wergles, Gonzalo Parrado Hernando, Nikos Kleanthis, Vassilis Stavrakas, Charalampos Platias, Georg Holtz, Konstantinos Koasidis, Alexandros Nikas
Abstract:	Presented by Alexandros Nikas
Conference:	SSH Energy Workshop 2024 – Futuring inter- and transdisciplinary energy research, for whom, by whom?
Date:	16-17 June, 2025
Venue:	Zurich, Switzerland
Synergies:	
Citation (APA):	Frilingou, N., Heussaff, C., Zachmann, G., Mittal, S., van de Ven, D., -J., Horowitz, R., Rodés Bachs, C., García-Murosa, X., Al Khourdajie, A., Johannsen, R. M., Thellufsen, J. Z., Fragkos, P., Zisarou, E., Wergles, N., Hernando, G. P., Kleanthis, N., Stavrakas, V., Platias, Ch., Holtz, G., Koasidis, K., Nikas, A. Advancing participatory integrated assessment modelling via a Policy Response Mechanism: a novel approach to policy-relevant, stakeholder-driven modelling, SSH Energy Workshop 2024 – Futuring inter- and transdisciplinary energy research, for whom, by whom?, June 16-17, 2025, Zurich, Switzerland.

4.42 Frilingou et al. (2025), 30th Annual Conference of the European Association of Environmental and Resource Economists, 16-19 June, 2025

Title:	Regional impacts of energy technologies' cost of capital on decarbonisation
Type	Presentation
Authors:	Natasha Frilingou, Dirk-Jan van de Ven, Jon Sampedro, Russell Horowitz, Clàudia Rodés-Bachs, Thomas Nikolakakis, Anastasios Karamaneas, Kimon Georgiou, Konstantinos Koasidis, Shivika Mittal, Charalampos Platias, Conall Heussaff, Christoph Bertram, Alexandros Nikas
Abstract:	Presented by Natasha Frilingou
Conference:	30th Annual Conference of the European Association of Environmental and Resource Economists
Date:	16-19 June, 2025

Venue: Bergen, Norway

Synergies: HE DIAMOND (GA: 101081179)

Citation (APA): Frilingou, N., Van de Ven, D, - J., Sampedro, J., Horowitz, R., Rodés-Bachs, C., Nikolakakis, T., Karamaneas, A., Georgiou, K., Koasidis, K., Mittal, S., Platias, C., Heussaff, C., Bertram, C., Nikas, A. Regional impacts of energy technologies' cost of capital on decarbonisation, 30th Annual Conference of the European Association of Environmental and Resource Economists, June 16-19, 2025, Bergen, Norway.

4.43 Van de Ven et al. (2025), XX CONGRESO DE LA AEEE, 2-4 June, 2025

Title:	Comparing cost-optimal to policy-driven scenarios for a decarbonised European energy system
Type	Presentation
Authors:	Dirk-Jan Van de Ven, Russell Horowitz, Claudia Rodes Bachs, Jon Sampedro, Shivika Mittal, Alexandre Torne, Evelina Trutnevyte, Konstantinos Koasidis, Alexandros Nikas, Natasha Frilingou
Abstract:	
Conference:	XX CONGRESO DE LA AEEE
Date:	2-4 June, 2025
Venue:	Bilbao, Spain
Synergies:	HE DIAMOND (GA: 101081179)
Citation (APA):	Van de Ven, D.-J., Horowitz, R., Rodés Bachs, C., Sampedro, J., Mittal, S., Torne, A., Trutnevyte, E., Koasidis, K., Nikas, A., and Frilingou, N. Comparing cost-optimal to policy-driven scenarios for a decarbonised European energy system, XX CONGRESO DE LA AEEE, 2-4 June 2025, Bilbao, Spain

4.44 Dekker & Al Khourdajie (2025), Scenarios Forum 2025, 16-18 July, 2025

Title:	Mapping the solution space through multi-layered scenario analysis
Type	Presentation
Authors:	Mark Dekker, Alaa Al Khourdajie
Abstract:	Presented by Alaa Al Khourdajie
Conference:	Scenarios Forum 2025
Date:	16-18 July, 2025
Venue:	Leeds, UK
Synergies:	
Citation (APA):	Dekker, M. & Al Khourdajie, A. Mapping the solution space through multi-layered scenario analysis. Scenarios Forum 2025, July 16-18, Leeds, UK.

4.45 Al Khourdajie et al. (2025), Scenarios Forum 2025, 16-18 July, 2025

Title:	Navigating the unexpected: The impact of disruptive events on mitigation scenarios
Type	Presentation
Authors:	Alaa Al Khourdajie, Alexandros Nikas, Natasha Frilingou, Shivika Mittal, Dirk Jan van de Ven, Panagiotis Fragkos, Haewon McJeon, Ed Byers, Ilkka Keppo, Glen Peters, David McCollum, Eleftheria Zisarou, Adam Hawkes, Ajay Gambhir, Ed Byers, Ilkka Keppo, Glen Peters, David McCollum, Eleftheria Zisarou, Adam Hawkes, Ajay Gambhir
Abstract:	Presented by Alaa Al Khourdajie
Conference:	Scenarios Forum 2025
Date:	16-18 July, 2025
Venue:	Leeds, UK
Synergies:	
Citation (APA):	Al Khourdajie, A., Nikas, A., Frilingou, N., Mittal, S., van de Ven, D-J., Fragkos, P., McJeon, H., Byers, E., Keppo, I., Peters, G., McCollum, D., Zisarou, E., Hawkes, A., Gambhir, A., Navigating the unexpected: The impact of disruptive events on mitigation scenarios, Scenarios Forum 2025, July 16-18, Leeds, UK.

4.46 Fragkos et al. (2025), Eighteenth Annual Meeting of the Integrated Assessment Modeling Consortium (IAMC), 11-13 November, 2025

Title:	A multi-model assessment of technological constraints on Europe's energy transition
Type	Presentation
Authors:	Panagiotis Fragkos, Eleftheria Zisarou, Dirk-Jan Van De Ven, Shivika Mittal, Lorenzo Rinaldi, Matteo Rocco, Clàudia Rodés-Bachs, Natasha Frilingou, Conall Heussaff, Alexandros Nikas
Abstract:	Presented by Panagiotis Fragkos
Conference:	Eighteenth Annual Meeting of the Integrated Assessment Modeling Consortium (IAMC)
Date:	11-13 November, 2025
Venue:	Rio de Janeiro, Brazil
Synergies:	
Citation (APA):	Fragkos, P., Zisarou, E., Van De Ven, D.J., Mittal, S., Rinaldi, Matteo Rocco, M., Rodés-Bachs, C., Frilingou, N., Heussaff, C., Nikas, A. (2025). A multi-model assessment of technological constraints on Europe's energy transition. 18th IAMC Annual Meeting, November 11-13, 2025, Rio de Janeiro, Brazil

4.47 Stavrakas et al. (2025), Eighteenth Annual Meeting of the Integrated Assessment Modeling Consortium (IAMC), 11-13 November, 2025

Title:	Top-down and bottom-up modelling of current and future decarbonisation trends in the buildings sector across different scales and contexts
Type	Presentation
Authors:	Vassilis Stavrakas, Nikos Kleanthis, Panagiotis Fragkos, Behzad Zamanipour, Rasmus Johannsen, Dimitris Papantonis, Meng Yuan, Jyoti Maheshwari, Farzin Ahmadi, Jakob Thellufsen, Ilkka Keppo, Saritha Vishwanathan, Alexandros Flamos
Abstract:	Presented by Vassilis Stavrakas
Conference:	Eighteenth Annual Meeting of the Integrated Assessment Modeling Consortium (IAMC)
Date:	11-13 November, 2025
Venue:	Rio de Janeiro, Brazil
Synergies:	
Citation (APA):	Stavrakas, V., Kleanthis, N., Fragkos, P., Zamanipour, B., Johannsen, R.M., Zisarou, E., Papantonis, D., Yuan, M., Maheshwari, J., Ahmadi, F., Thellufsen, J.Z., Keppo, I., Vishwanathan, S., Flamos, A. (2025). Top-down and bottom-up modelling of current and future decarbonisation trends in the buildings sector across different scales and contexts. 18th IAMC Annual Meeting, November 11-13, 2025, Rio de Janeiro, Brazil

4.48 Kleanthis et al. (2025), Eighteenth Annual Meeting of the Integrated Assessment Modeling Consortium (IAMC), 11-13 November, 2025

Title:	Coupling transformative scenario design with capacity expansion modelling towards carbon-neutral energy systems and just transition strategies
Type	Presentation
Authors:	Nikos Kleanthis, Vassilis Stavrakas, Alexandros Flamos
Abstract:	Presented by Nikos Kleanthis
Conference:	Eighteenth Annual Meeting of the Integrated Assessment Modeling Consortium (IAMC)
Date:	11-13 November, 2025
Venue:	Rio de Janeiro, Brazil
Synergies:	
Citation (APA):	Kleanthis, N., Stavrakas, V., Flamos, A. (2025). Planning alternatives under different future-world evolutions: Coupling transformative scenario design with capacity expansion modelling towards carbon-neutral energy systems and just transition strategies. 18th IAMC Annual Meeting, November 11-13, 2025, Rio de Janeiro, Brazil.

4.49 Anagnostopoulou et al. (2025), Eighteenth Annual Meeting of the Integrated Assessment Modeling Consortium (IAMC), 11-13 November, 2025

Title:	Towards deep cuts in emissions in the residential sector by 2050: Bottom-up demand-side modelling in support of real-world policymaking at the national level
Type	Presentation
Authors:	Chrysanthi Anagnostopoulou, Dimitris Papantonis, Dimitra Tzani, Vassilis Stavrakas, Alexandros Flamos
Abstract:	Presented by Chrysanthi Anagnostopoulou
Conference:	Eighteenth Annual Meeting of the Integrated Assessment Modeling Consortium (IAMC)
Date:	11-13 November, 2025
Venue:	Rio de Janeiro, Brazil
Synergies:	
Citation (APA):	Anagnostopoulou, C., Papantonis, D., Tzani, D., Stavrakas, V., Flamos, A. (2025). Towards deep cuts in emissions in the residential sector by 2050: Bottom-up demand-side modelling in support of real-world policymaking at the national level. 18th IAMC Annual Meeting, November 11-13, 2025, Rio de Janeiro, Brazil.

4.50 Al Khourdajie et al. (2025), Eighteenth Annual Meeting of the Integrated Assessment Modeling Consortium (IAMC), 11-13 November, 2025

Title:	A multi-model assessment of technological constraints on Europe's energy transition
Type	Presentation
Authors:	Alaa Al Khourdajie, Alexandros Nikas, Natasha Frilingou, Shivika Mittal, Dirk Jan van de Ven Panagiotis Fragkos Haewon McJeon Ed Byers Ilkka Keppo Glen Peters David McCollum Eleftheria Zisarou Adam Hawkes Ajay Gambhir
Abstract:	Presented by Alaa Al Khourdajie
Conference:	Eighteenth Annual Meeting of the Integrated Assessment Modeling Consortium (IAMC)
Date:	11-13 November, 2025
Venue:	Rio de Janeiro, Brazil
Synergies:	
Citation (APA):	Al Khourdajie, A., Nikas, A., Frilingou, N., Mittal, S., van de Ven, D-J., Fragkos, P., McJeon, H., Byers, E., Keppo, I., Peters, G., McCollum, D., Zisarou, E., Hawkes, A., Gambhir, A., Navigating the unexpected: The impact of disruptive events on mitigation scenarios. 18th IAMC Annual Meeting, November 11-13, 2025, Rio de Janeiro, Brazil

5 Policy Briefs

In this section, the documents explicitly produced to inform policymakers during the project's lifetime are presented⁶ with details such as their title, abstract, keywords, and the website URL where they can be found.

5.1 All partners (2022), Modelling Capabilities and the Policy Response Mechanism

Title:	Stakeholder Inclusion in Climate and Energy Policy Modelling – The IAM COMPACT Policy Response Mechanism
Authors:	All modelling teams
Abstract:	The purpose of this policy brief is to provide external stakeholders with an overview of the envisaged modelling process of the IAM COMPACT project and explain the stakeholder engagement strategy that will form a core part of this process. The strategy revolves around the policy response mechanism, a process that will facilitate constructive dialogue and knowledge sharing between stakeholders and modellers with the aim of generating policy-relevant insights from the IAM COMPACT research agenda.
Keywords:	Policy brief; Integrated assessment models (IAMs); Climate policy; Climate science; Co-creation; Policy questions
Link:	Here
Online:	November 2022

⁶ <https://iam-compact.eu/publications/policy-briefs>

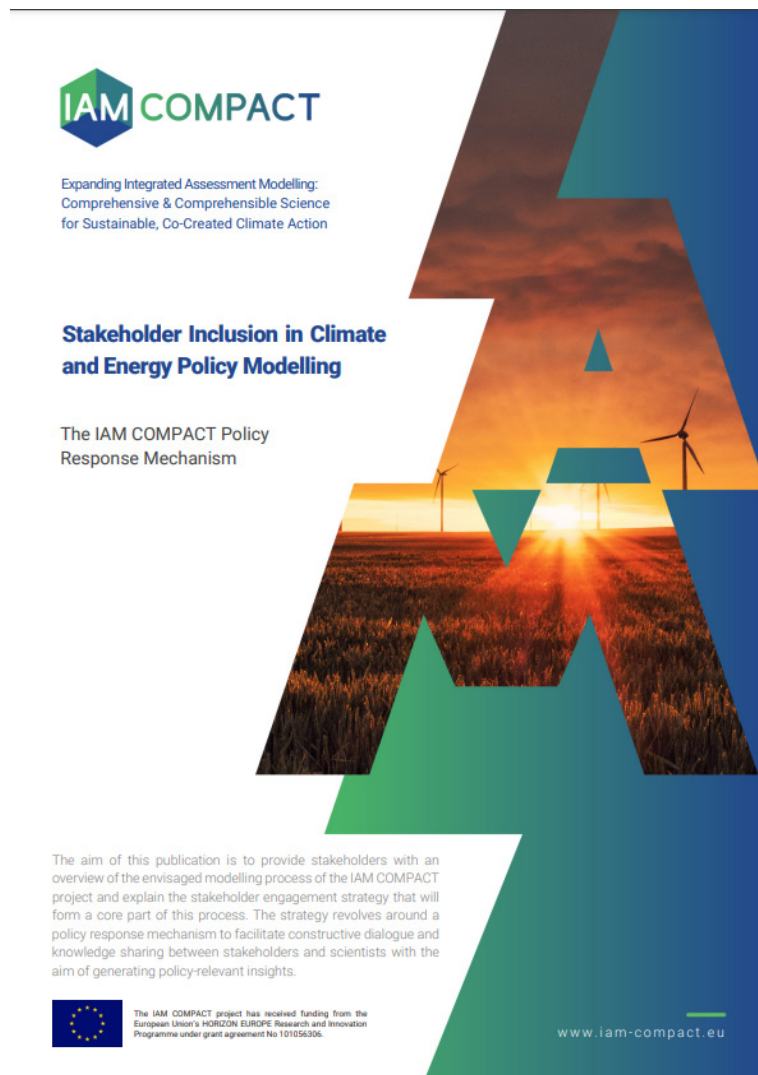


Figure 53. Preview of 'Stakeholder Inclusion in Climate and Energy Policy Modelling - The IAM COMPACT Policy Response Mechanism' Policy Brief

5.2 Nikas et al. (2023), Three responses to the energy crisis - the co-benefits of energy efficiency

Title:	Three responses to the energy crisis - the co-benefits of energy efficiency
Authors:	Alexandros Nikas (NTUA), Natasha Frilingou (NTUA), Konstantinos Koasidis (NTUA), Haris Doukas (NTUA), Conall Heussaff (Bruegel), Georg Zachmann (Bruegel), Panagiotis Fragkos (E3M), Anastasis Giannousakis (E3M), Shivika Mittal (Imperial), Sara Giarola (Imperial), Ajay Gambhir (Imperial), Dirk-Jan van de Ven (BC3), Jon Sampedro (BC3), Jan-Philipp Sasse (UNIGE), Evelina TrutnevYTE (UNIGE), Lorenzo Rinaldi (POLIMI), Nicolò Golinucci (POLIMI), Matteo Vincenzo Rocco (POLIMI), Georgios Xexakis
Abstract:	The ongoing war between Russia and Ukraine has created an energy crisis, which has impacted the EU, given its significant reliance on Russian natural gas. This brief explores three scenarios to replace Russian natural gas: increasing gas imports from other regions, increasing domestic production, and accelerating energy efficiency. The scenarios are benchmarked against a baseline scenario that reflects mitigation efforts implied by Nationally Determined Contributions and Long-Term Strategies. The brief aims to provide insights into the trade-offs between the different approaches to replacing Russian gas and their implications for energy sustainability, affordability, and emissions
Keywords:	Regional modelling
Link:	Here
Online:	April 2023

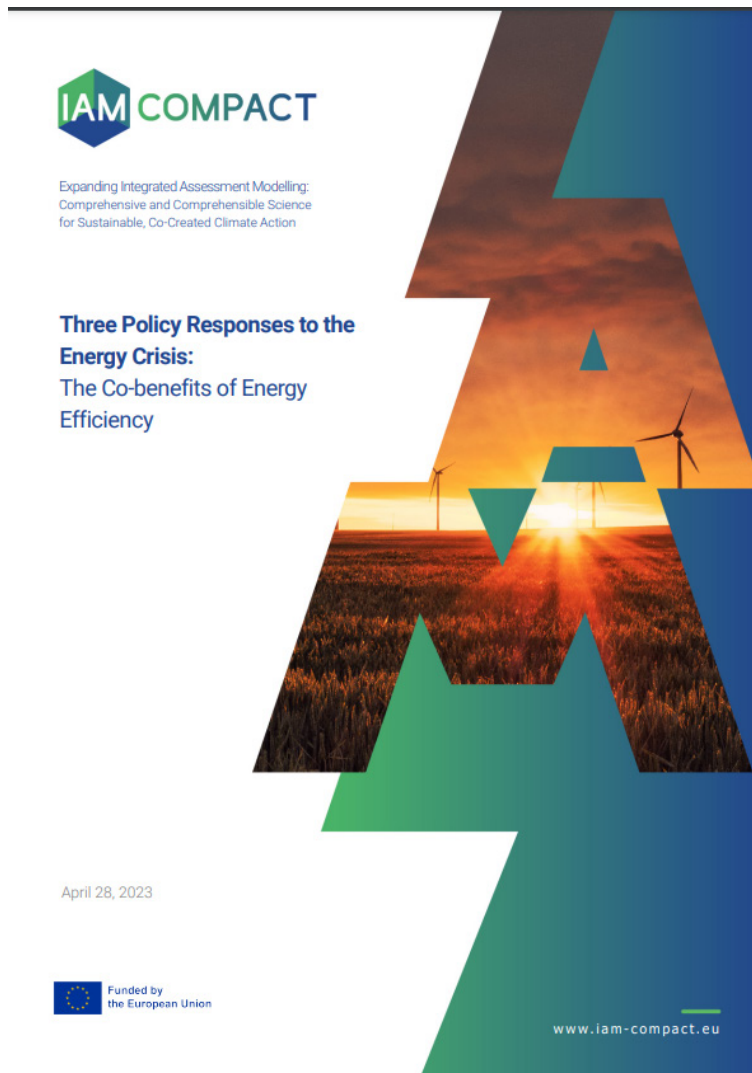


Figure 54. Preview of 'Three responses to the energy crisis - the co-benefits of energy efficiency' Policy Brief

5.3 Frilingou et al. (2025), Cost of capital evolution effects on regional mitigation pathways: Financing renewable investments in low- and middle-income countries

Title:	Cost of capital evolution effects on regional mitigation pathways: Financing renewable investments in low- and middle-income countries
Authors:	Natasha Frilingou (NTUA), Alexandros Nikas (NTUA), Konstantinos Koasidis (NTUA), Thomas Nikolakakis (NTUA), Anastasios Karamaneas (NTUA), Kimon Georgiou (NTUA), Dirk-Jan Van de Ven (BC3), Jon Sampedro (BC3), Russell Horowitz (BC3), Clàudia Rodés-Bachs (BC3), Shivika Mittal (CICERO), Charalampos Platias (Panteion), Conall Heussaff (Bruegel), Christoph Bertram (UMD, PIK)
Abstract:	This policy brief is part of the theme Global Effects, which considers trade and macroeconomic issues and their effects on European decarbonisation. During the workshop conducted under this theme, we sought feedback on the scenario design, inputs, and projections of two proposed modelling studies. Following an in-depth discussion on uncertainty factors and how these may play out, the 20 participating stakeholders—among others from DG Trade, DG ECFIN, the European Central Bank, and the National Bank of Belgium—were asked to also fill out a survey on how perceived costs may evolve for different technologies and countries around the world. The study presented here looked at how regionally and technologically differentiated cost of capital projections could affect decarbonisation pathways in Europe and around the world.
Keywords:	
Link:	Here
Online:	March 2025



Expanding Integrated Assessment Modelling:
Comprehensive and Comprehensible Science for
Sustainable, Co-Created Climate Action

**Cost of capital
evolution effects on
regional mitigation
pathways:**
Financing renewable
investments in low- and
middle-income
countries



20/03/2025



Figure 55. Preview of 'Cost of capital evolution effects on regional mitigation pathways: Financing renewable investments in low- and middle-income countries' Policy Brief

5.4 Johannsen et al. (2025), Enhancing Renewable Energy System Metrics: Security, Flexibility, and Sustainability

Title:	Enhancing Renewable Energy System Metrics: Security, Flexibility, and Sustainability
Authors:	Rasmus Magni Johannsen (AAU), Sebastian Bach Johannsen (AAU), Jakob Zink Thellufsen (AAU), Lorenzo Rinaldi (POLIMI), Matteo Vincenzo Rocco (POLIMI), Konstantinos Koasidis (NTUA), Jaime Nieto (UVA), Nikos Kleanthis (UPRC), Vassilis Stavrakas (UPRC), Conall Heussaff (Bruegel)
Abstract:	This policy brief is part of the theme Optimal Transition, which investigates how to best manage the energy transition in Europe, through national and European climate and energy targets, decarbonisation of electricity generation, and electrification of energy services, guided by the following research question: What are the different cost, energy security, and resilience metrics and how do they compare for different scenarios? The consultative process helped us evaluate the relevance of policy issues, refine the scope of research questions, and establish a balanced group of stakeholders to participate. We conducted one workshop under each theme alongside the corresponding core working group to consult stakeholders on our scenario design and co-define desired outputs as well as a key set of joint input assumptions. During the workshop conducted under this theme, we sought feedback on the scenario design, inputs, and projections of two proposed modelling studies. The participating stakeholders, including representatives from the DG ENER, the Agency for the Cooperation of Energy Regulators (ACER), and the renewable energy industry, provided insights on the most policy relevant aspects of energy system security, resilience and flexibility. Suggestions were also offered to IAM COMPACT partners on specific metrics that could be used to assess model results along these criteria.
Keywords:	
Link:	Here
Online:	April 2025



Expanding Integrated Assessment Modelling:
Comprehensive and Comprehensible Science for
Sustainable, Co-Created Climate Action

**Enhancing
Renewable Energy
System Metrics:
Security, Flexibility, and
Sustainability**

30/04/2025



Figure 56. Preview of 'Enhancing Renewable Energy System Metrics: Security, Flexibility, and Sustainability' Policy Brief

5.5 Fragkos et al. (2025), Tech-constrained EU pathways to net zero: Impact of geopolitical disruptions and supply chain shocks

Title:	Tech-constrained EU pathways to net zero: Impact of geopolitical disruptions and supply chain shocks
Authors:	Panagiotis Fragkos (E3-Modelling), Eleftheria Zisarou (E3-Modelling), Dirk-Jan Van De Ven (Basque Centre for Climate Change), Shivika Mittal (CICERO), Lorenzo Rinaldi (Politecnico di Milano), Matteo Rocco (Politecnico di Milano), Clàudia Rodés-Bachs (Basque Centre for Climate Change), Natasha Frilingou (National Technical University of Athens), Ugne Keliauskaite (Bruegel), Conall Heussaff (Bruegel), Alexandros Nikas (National Technical University of Athens)
Abstract:	This policy brief, part of the Global Effects theme within IAM COMPACT, investigates how supply chain constraints and geopolitical uncertainties may hinder the EU's decarbonisation efforts. Using three leading Integrated Assessment Models (IAMs), the analysis evaluates the implications of limitations and constraints in the uptake of key low-carbon technologies by developing four scenarios. The baseline scenario (NDC-LTT) implements the NDC targets for 2030 and the long-term mitigation goals for 2050. Three additional scenarios examine the impact of constraints on the uptake of 1) renewable energy and batteries, 2) biomass, and 3) carbon capture and storage (CCS), all critical for decarbonisation. The brief aims to evaluate the risks and challenges faced by the EU's decarbonisation pathways and suggests strategies to enhance resilience against external disruptions. Key questions include: 1. How do supply chain constraints impact the ramp-up of clean technologies? 2. Are specific configurations of the EU's energy system more vulnerable to geopolitical disruptions? 3. How resilient are transition pathways if certain low-carbon technologies are unavailable? This brief aims to provide policy-relevant insights to stakeholders and policymakers to better anticipate and address the risks posed by geopolitical and technological factors, ensuring a cost-efficient and resilient transition to a low-carbon economy. It emphasises the importance of building resilient, net-zero energy systems that can adapt to challenges and uncertainties. The results provide insights into the CO₂ emissions, primary energy supply, and electricity generation implications of geopolitical constraints and technology limitations. The findings highlight the importance of strategic planning, global cooperation, and diversification of supply chains to mitigate the risks associated with the decarbonisation challenge. The analysis shows that EU decarbonisation is heavily reliant on: - the supply of zero-emission electricity (which underscores risks in renewable energy deployment, critical materials, grid infrastructure, and energy storage), - low-carbon technologies and fuels for transportation (challenges in accelerating the upscale of electric vehicles and low-carbon fuels), - slower decarbonisation in industry and power generation (dependency on CCS and bioenergy). Moreover, policymakers need to explore alternative strategies to ensure the robustness and resilience of the EU's transition towards a low-carbon future.
Keywords:	
Link:	Here
Online:	May 2025



Expanding Integrated Assessment Modelling:
Comprehensive and Comprehensible Science for
Sustainable, Co-Created Climate Action

**Tech-constrained EU
pathways to net zero:**
Impact of geopolitical
disruptions and supply
chain shocks

12/05/2025



Figure 57. Preview of 'Tech-constrained EU pathways to net zero: Impact of geopolitical disruptions and supply chain shocks' Policy Brief

5.6 Teferi et al. (2025), Collaborative modelling for new climate commitments

Title:	Collaborative modelling for new climate commitments
Authors:	Solomon Tesfamariam Teferi (Addis Ababa University), Fitsum S. KEBEDE, PhD (Addis Ababa University), Camilla Lo Giudice (KTH Royal Institute of Technology), Chamindie Senaratne (KTH Royal Institute of Technology), Francesco Gardumi (KTH Royal Institute of Technology), Ioannis Tsipouridis (Dr) (Technical University of Mombasa), Conall Heussaff (Bruegel - Improving economic policy), Natasha Frilingou (DSS Lab, EPU-NTUA), Alexandros Nikas (DSS Lab, EPU-NTUA)
Abstract:	The brief documents a core component of the IAM COMPACT project, our Policy Response Mechanism (PRM), a valuable tool at the science-policy interface, a co-creation process that has facilitated not only our internal exchanges, but also our collaboration with external stakeholders. It also investigates how the PRM enabled a series of exchanges with different groups of external actors in our pilot countries, including not only policy advice and modelling priorities but also training of new experts through workshops and capacity development activities.
Keywords:	
Link:	Here
Online:	May 2025

CORDIS Results Pack on Africa-EU collaboration
Advancing the Africa-EU climate change and sustainable energy partnership

Collaborative modelling for new climate commitments

Global research centres, including universities in Kenya and Ethiopia, collaborate with stakeholders in four partner countries to co-create integrated assessment models that address relevant climate and sustainability concerns.



At the heart of the Paris Agreement, the flagship of global efforts to combat climate change, is each country's [nationally determined contributions](#) (NDCs). Contrary to expectations, current climate policies and the NDCs that support them are not on track to meet objectives. Countries around the world must reevaluate their commitment to fighting global warming and produce more ambitious NDCs for 2030 and beyond.

"NDCs must be realistic and ambitious, while also meeting the needs of both sustainable development and climate mitigation," notes the KTH team, led by Francesco Gardumi. Diverse tools and input from a wide range of constituencies are required. The EU-funded [IAM COMPACT](#) project co-created a research process involving scientists and other stakeholders to leverage [integrated assessment models](#) (IAMs) and produce new climate policies.

Infrastructure for holistic IAMs

IAMs incorporate features of society such as economics and development to inform policy decisions related to climate change. To facilitate the inclusion of more non-scientists in the next phase of NDC development, the project created a communication scaffold.

Elements of the communication infrastructure created by researchers and other stakeholders include listening, exchanging, modelling, expanding and explaining. This fruitful structure has led to over 50 papers in top tier journals, 22 model documentation videos, reports on global and regional long-term mitigation targets and numerous conferences, policy events and briefs.

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Figure 58. Preview of 'Collaborative modelling for new climate commitments' Policy Brief

6 Newsletters

In the context of IAM COMPACT's communication and dissemination strategy, the consortium is releasing regular newsletters⁷ to the project's subscribed followers. These newsletters are demonstrated in this section including their title, link, and headlines. The first newsletter became available in February 2023, after the website became available and the project's Communication, Dissemination, and Exploitation (CDE) plan was put together.

6.1 February 2023

Title: IAM COMPACT News: February 2023
Headline: Introducing the IAM COMPACT project in support of climate policymaking
Link: <https://preview.mailerlite.com/q7r8v2c7n5>

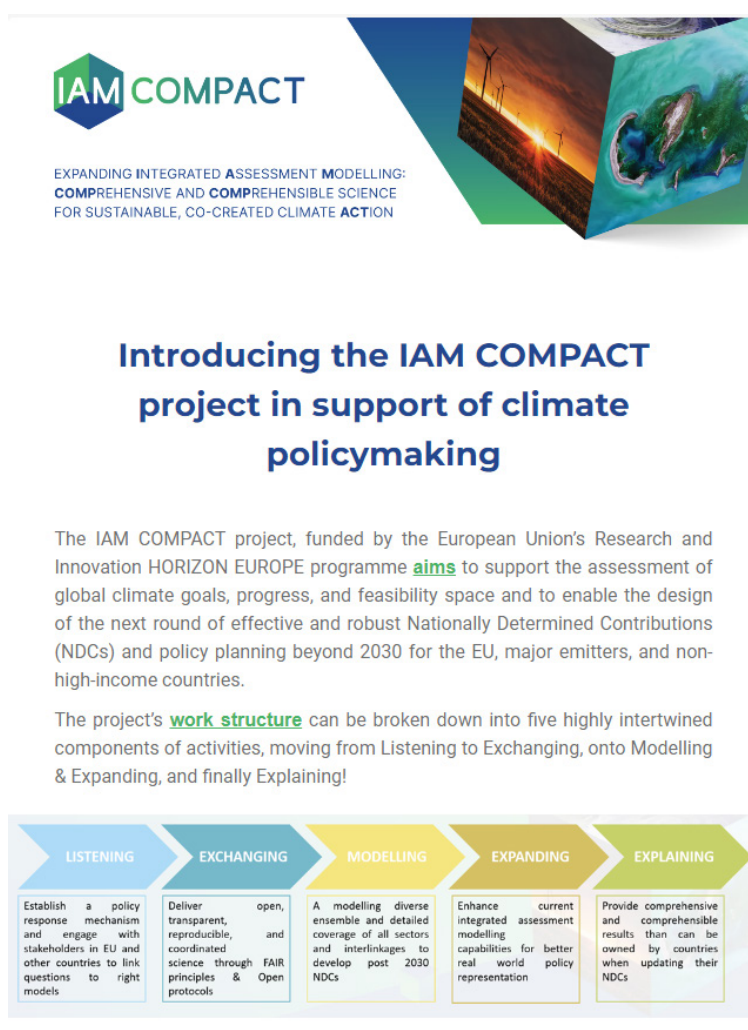


Figure 59. Preview of February 2023 Newsletter

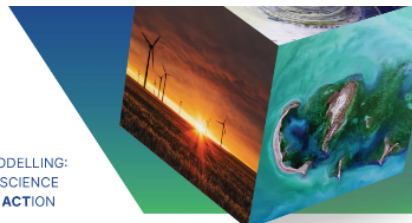
⁷ <https://iam-compact.eu/communication/newsletters-press-releases>

6.2 March 2023

Title: IAM COMPACT News: March 2023
Headline: Editorial
Link: <https://preview.mailerlite.com/a8x4t6x2e5>



EXPANDING INTEGRATED ASSESSMENT MODELLING:
 COMPREHENSIVE AND COMPREHENSIBLE SCIENCE
 FOR SUSTAINABLE, CO-CREATED CLIMATE ACTION



Editorial

In the wake of the latest IPCC Synthesis Report, many may wonder where—in the face of this increasing litany of scientific warnings setting out the catastrophe the world is facing—do we find hope? The good news is we still have some slim chances, as well as multiple economically and technically feasible and effective means, to reduce GHG emissions and adapt to human-caused climate change. Yet the world needs urgent, coordinated action now of vastly different stakeholders to address both near-term challenges, and long-term risks!

Looking from a science-policy lens, IAM COMPACT envisages to be the first, truly co-creative climate-economy modelling project to underpin climate policymaking in support of the Paris Agreement principles, with authoritative scientific results and robust projections against different types of uncertainties that are inherent in climate and socioeconomic evolution, and operational capacity. In this regard, IAM COMPACT employs a diversified portfolio of 25 global and regional integrated assessment models, energy and electricity models, as well as sectoral models that altogether accurately cover all geographic scales, the multiplicity of socioeconomic dimensions and economic sectors, and all types of emissions.

Figure 60. Preview of March 2023 Newsletter

6.3 May 2023

Title: IAM COMPACT News: May 2023

Headline: European Commission's 2040 target planning process

Link: <https://preview.mailerlite.com/k0a2i4p4e3>



Figure 61. Preview of May 2023 Newsletter

6.4 July 2023

Title: IAM COMPACT News: July 2023

Headline: Save the date and join the IAM COMPACT capacity development workshops in Mombasa, Kenya

Link: <https://preview.mailerlite.com/z1q9q3t8v8>



Save the date and join the IAM COMPACT capacity development workshops in Mombasa, Kenya

The IAM COMPACT capacity building workshops in Mombasa are set to take place from August 29 to September 1, 2023, with the aim to boost in-country interpretation of scientific evidence for practical action, as well as critically to provide hands-on training on selected modelling tools towards eventually helping guide the development of local model applications for national energy, climate, and sustainability policy support. These workshops, hosted by the **Renewable Energy and Climate Change Research Centre (RECCReC)** at the **Technical University of Mombasa (TUM)** and supported among others by the **Politecnico di Milano (POLIMI)**, the **KTH Royal Institute of Technology (KTH)**, and the **National Technical University of Athens (NTUA)**, will bring together city representatives, experts, students, and stakeholders to provide knowledge on modelling for sustainable development and energy planning for one of the **fastest growing economies** in Africa, **Kenya**.

Figure 62. Preview of July 2023 Newsletter

6.5 September 2023

Title: IAM COMPACT News: September 2023
Headline: IAM COMPACT 2nd General Assembly, August 28 in Mombasa, Kenya
Link: <https://preview.mailerlite.com/f2u9o2x1t0>



IAM COMPACT 2nd General Assembly, August 28 in Mombasa, Kenya



On the 28th of August, the **IAM COMPACT** consortium came together in Mombasa, Kenya, for its 2nd General Assembly. The hybrid meeting was well attended both physically and remotely and it was a great opportunity for all partners to update on current achievements and discuss steps to a foolproof planning to keep meeting our research project's objectives. In short, our constructive discussions enabled to review our core modelling activities, while focusing on the progress of the Core Working Group meetings that took place as part of **IAM COMPACT**'s Policy Response Mechanism, as well as on the

Figure 63. Preview of September 2023 Newsletter

6.6 October 2023

Title: IAM COMPACT News: October 2023

Headline: Community Building: Participation in the European Climate and Energy Modelling Forum – ECEMP 2023

Link: <https://preview.mailerlite.com/q4u0p2l1m6>



Community Building: Participation in the European Climate and Energy Modelling Forum – ECEMP 2023



Earlier this month, **IAM COMPACT** took part in the annual ECEMP conference that was held virtually on October 5-6, 2023. This year's edition focused on net zero, intermediate targets, and sectoral decarbonisation facing geopolitical and macroeconomic challenges. In particular,

- Day I was dedicated to "Mid-term targets towards Net Zero and sectoral challenges", and
- Day II focused on "Macroeconomic and geopolitical challenges and the Net Zero transition".

Figure 64. Preview of October 2023 Newsletter

6.7 December 2023

Title: IAM COMPACT News: December 2023
Headline: IAM COMPACT wishes you happy holidays!
Link: <https://preview.mailerlite.com/j1y4u9h8b6>



Figure 65. Preview of December 2023 Newsletter

6.8 January 2024

Title: IAM COMPACT News: January 2024
Headline: Capacity development workshops
Link: <https://preview.mailerlite.com/k8z4d8z5r0>



Capacity development workshops

IAM COMPACT envisages to be the first, truly co-creative climate-economy modelling project, so that its research questions are scientifically groundbreaking and demand-driven, its results pass the political economy and ecological validity tests, and its process is transparent, comprehended, trusted, legitimised, nationally owned, and transformed into practical action. This includes such countries with limited so far in-house capacity to underpin their sustainable way forward. IAM COMPACT will thus upscale the validation of the approach to co-creating narratives for Paris-compliant sustainable development that international organisations, such as UNDP and UNDESA, employ at the national or regional level.

Ethiopia, Sri Lanka, and Kenya are among such countries, featuring a wide range of challenges: Ethiopia and Kenya are among the fastest developing countries in Africa with multiple open sustainability fronts, while Sri Lanka is an island state in South Asia facing severe sustainability threats from climate change. Nonetheless, all three countries share an ambition to increase mitigation and adaptation efforts and limitations in technical capacity to support such efforts.



Figure 66. Preview of January 2024 newsletter

6.9 February 2024

Title: IAM COMPACT News: February 2024
Headline: Development of technical and institutional capacity in IAM COMPACT pilot countries
Link: <https://preview.mailerlite.com/o3f2d9o5p8>



Development of technical and institutional capacity in IAM COMPACT pilot countries

Energy Systems Modelling for Sustainable Development in Ethiopia

The second IAM COMPACT capacity-building workshop, "Energy Systems Modelling for Sustainable Development in Ethiopia", took place on January 23-24, at the Addis Ababa Institute of Technology (AAiT), Addis Ababa, Ethiopia as a hybrid event.



Figure 67. Preview of February 2024 newsletter

6.10 March 2024

Title: IAM COMPACT News: March 2024
Headline: IAM COMPACT wishes you happy Easter!
Link: <https://preview.mailerlite.com/k2v9w8s0k1>



IAM COMPACT wishes you **happy Easter!**



The IAM COMPACT project consortium wishes you a lovely break, and a bright and happy spring!

Looking forward to working together as we slowly enter our 2nd Policy Response Mechanism cycle and hoping for exciting things ahead!

Open access training and teaching material on energy system and integrated assessment modelling concepts and tools.

Now accessible on our [Zenodo](#) repository in the form of pptx files and licensed under CC BY 4.0, the first IAM COMPACT energy system and integrated assessment modeling training package consists of the following presentations (separated by concept):

- Introduction to energy (and electrification) modelling; DOI: [10.5281/zenodo.10715685](https://doi.org/10.5281/zenodo.10715685)
- Introduction to OnSSET; DOI: [10.5281/zenodo.10719078](https://doi.org/10.5281/zenodo.10719078)
- Minigrid modelling; DOI: [10.5281/zenodo.10719106](https://doi.org/10.5281/zenodo.10719106)

Figure 68. Preview of March 2024 newsletter

6.11 May 2024

Title: IAM COMPACT News: May 2024
Headline: IAM COMPACT is halfway through!
Link: <https://preview.mailerlite.com/w5o3a3r9v9>



IAM COMPACT is halfway through!

18 months of policy-relevant, dedicated Integrated Assessment Modelling exercises in support of climate policymaking in the EU and worldwide.

The IAM COMPACT project recently celebrated its 18-month milestone! In its first half, project partners embarked on an excited and scientifically fruitful journey to generate new cross-cutting knowledge and co-create modelled pathways to underpin the design and assessment of climate policies in the EU, and in other major emitters and selected less emitting/developed countries, in respect to the Paris Agreement objectives.



This gives us many good reasons to look back with pride at some of our achievements to date, which we are excited to share with you through this newsletter, and to look forward with optimism to the second half ahead.

IAM COMPACT in numbers

Over the course of its 18-month lifetime, IAM COMPACT has among others:

- published 27 scientific papers in high-impact journals
- participated in 17 scientific conferences and in 8 thematically associated non-scientific events, with the objective of stimulating the interaction with its stakeholder ecosystem

Figure 69. Preview of May 2024 newsletter

6.12 October 2024

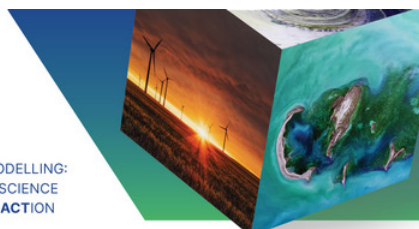
Title: IAM COMPACT News: October 2024

Headline: Four countries now have their own open-source modelling tools: Preliminary versions are now available!

Link: <https://preview.mailerlite.com/u4i3p1g6gZ>



EXPANDING INTEGRATED ASSESSMENT MODELLING:
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Four countries now have their own open-source modelling tools: Preliminary versions are now available!

Five open-access models that address several key policy questions have been developed by IAM COMPACT national partners in each of our four case study countries—Ethiopia, Kenya, Sri Lanka, and Ukraine—where such capacity had so far been limited. The key data sources for the models developed are documented on [Zenodo](#), together with the models' executables.

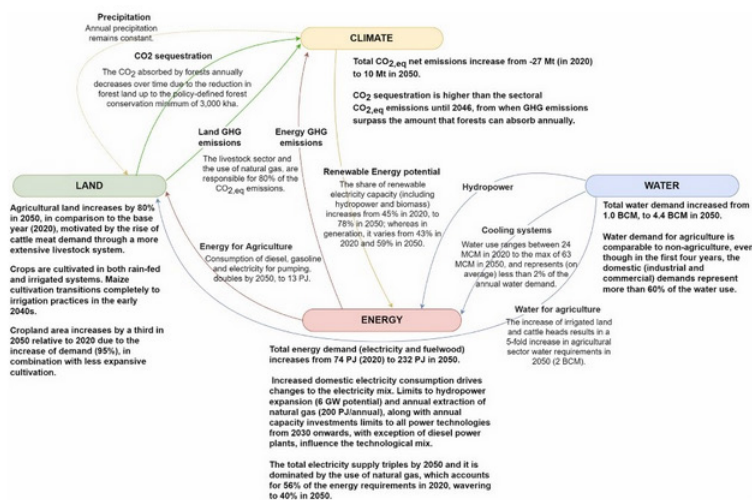


Figure 1. Summary of system and cross-system results of the Reference Scenario in CLEWs (Ramos et al. 2022), a model framework largely used for capacity development in IAM COMPACT

Figure 70. Preview of October 2024 newsletter

6.13 December 2024

Title: IAM COMPACT News: December 2024
Headline: IAM COMPACT wishes everyone happy holidays!
Link: <https://preview.mailerlite.com/f3h2z2j2a4>



IAM COMPACT wishes everyone
happy holidays!



The IAM COMPACT project consortium wishes you a lovely holiday break and a peaceful, hopeful, and more sustainable 2025!

After yet another year of expected [rise of atmospheric CO₂ concentration](#), we genuinely hope that 2025 will finally be the year of peak emissions.

Browse and download our brand-new infographics!

IAM COMPACT introduces a new series of infographics, intended to disseminate the open-access models developed for our four case-study countries (Ethiopia, Sri Lanka, Kenya and Ukraine), as well as to showcase key results on country-specific barriers, drivers, policy options, and implemented policies in a visually appealing way.

You can access and download them via our website ([link](#)).

These infographics are based on the work done under project Task 6.4 - Mitigation drivers, barriers, and policy options and Task 6.5 - Expansion and development of technical and institutional capacity in pilot countries. More information can be found in the deliverables themselves:

Figure 71. Preview of December 2024 newsletter

7 Press Releases

Five press releases⁸ have been sent as of January 2024 to the project's newsletter subscribers, aiming to communicate critical updates and/or news related to project progress or outputs.

7.1 May 2023

Title: IAM COMPACT Press Release: May 2023
Headline: Three Policy Responses to the Energy Crisis: the Co-benefits of Energy Efficiency
Link: <https://preview.mailerlite.com/d0z1a8u9b0>

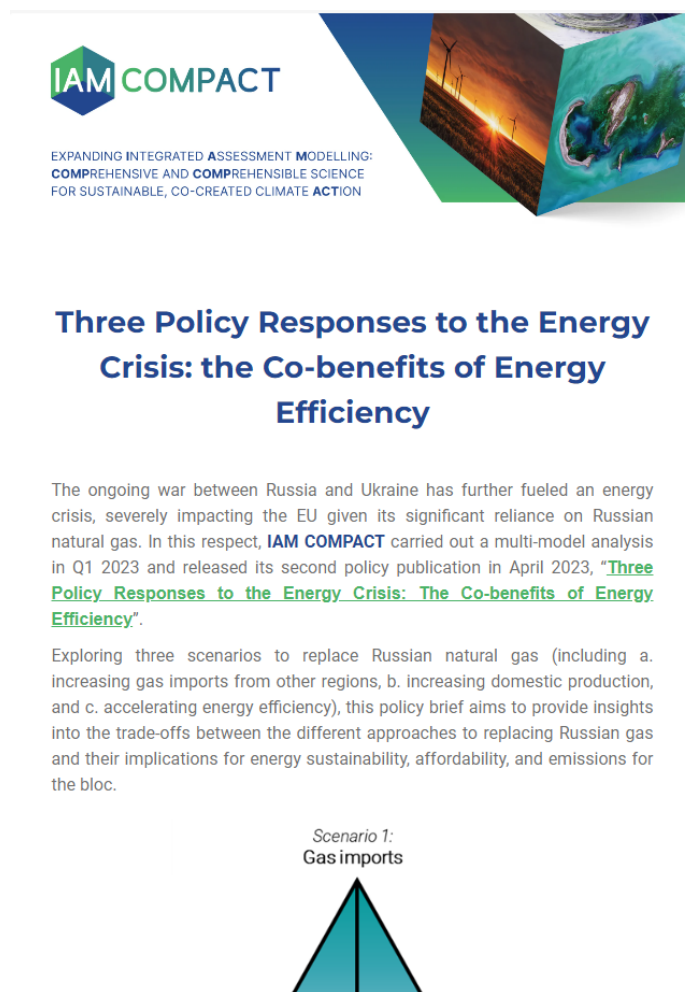


Figure 72. Preview of May 2023 Press Release

⁸ <https://iam-compact.eu/communication/newsletters-press-releases>

7.2 June 2023

Title: IAM COMPACT Press Release: June 2023

Headline: Climate promises may get us in the vicinity of 'well below 2°C' – but are they realistic?

Link: <https://preview.mailerlite.com/v6u6e5p3u3v>



Figure 73. Preview of June 2023 Press Release

7.3 September 2023

Title: IAM COMPACT Press Release: September 2023

Headline: IAM Compact Workshops for Capacity Development in Mombasa, Kenya

Link: <https://preview.mailerlite.com/g9m7q3n4z3/2313122918676043508/v4l1/>



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IAM Compact Workshops for Capacity Development in Mombasa, Kenya



Students, policymakers, and stakeholders from Kenya engaged with the IAM COMPACT consortium in a series of workshops held in the city of Mombasa, Kenya during the last week of August. The Mombasa workshops were the first step towards achieving one of the **IAM COMPACT objectives**: to boost international cooperation, partnership, and capacity during and after the project, by supporting the design of climate pledges and developing scientific and technical capabilities in the selected countries of Kenya, Ethiopia, Sri Lanka and Ukraine.

In a two-day session, on August 29-30, students from the Technical University of Mombasa (TUM) were introduced to integrated assessment modelling. The students started from what an energy system is and how to build scenarios

Figure 74. Preview of September 2023 Press Release

7.4 November 2023

Title: IAM COMPACT Press Release: November 2023
Headline: IAM COMPACT at COP 28, Dubai, United Arab Emirates
Link: <https://preview.mailerlite.com/k7b4d0p7s7>



IAM COMPACT at COP 28, Dubai, United Arab Emirates

From **30 November to 12 December 2023** delegates from nearly 200 countries will come together in **Dubai, United Arab Emirates (UAE)** for the **28th session** of the **Conference of the Parties of the UNFCCC (COP 28)** to deliberate on climate action strategies and commitments that will hopefully shape a better future of our planet. Importantly, this year's Conference marks the conclusion of the first Global Stocktake (GST), a comprehensive assessment of the progress made in achieving the goals of the Paris Agreement. High expectations on the climate finance front and "phasing out" fossil fuels (check also our latest infographic with a brief timeline of landmark COPs [here](#)).

IAM COMPACT, committed to supporting and advancing the ambition of climate policy planning beyond 2030 for the EU, major emitters, and non-high-income nations using a diverse ensemble of models and insights, will actively participate at COP 28. The project will co-host a panel discussion on **"Bridging the gap between the 'Fit for 55' package and the 2050 ambition of a net-zero EU economy"** at the **Greek Pavilion**, alongside the Horizon Europe **DIAMOND** project and the **Hellenic Society for the Environment and Cultural Heritage**. The key objectives of our side-event are to (a) highlight potential challenges to the EU's path to net zero, (b) fuel the policy debate on critical technologies including carbon capture and storage but also gas in the light of the recent energy supply crisis, and (c) share knowledge.

Figure 75. Preview of November 2023 Press Release

7.5 December 2023

Title: IAM COMPACT Press Release: December 2023

Headline: From Fit-for-55 to net-zero: Our new study on the EU's path to climate neutrality by 2050

Link: <https://preview.mailerlite.com/l3s3l5w5r5>



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From Fit-for-55 to net-zero: Our new study on the EU's path to climate neutrality by 2050

The EU has committed to becoming a net-zero economy by 2050 and achieving 55% emissions cuts in 2030, a goal that has been integrated into national strategies of several member states. However, the bloc's path toward achieving between these two targets bridging their gap through intermediate milestones remains unclear.

In our new study “A multi-model analysis of the EU's path to net zero”, resulting from a collaboration between **DIAMOND** and **IAM COMPACT** researchers and published in Joule ([here](#)), we used five whole-system climate-economy models (**GCAM**, **GEMINI-E3**, **ICES-XPS**, **EU-TIMES**, **NEMESIS**) and two sectoral models (**ALADIN**, **FORECAST**) that represent a wide range of economic theories to enhance the confidence in the produced knowledge, to explore how the EU can bridge the gap between 2030 and 2050 and keep net zero within reach by mid-century, offering insights into intermediate milestones and implications at sectoral and national levels.

Apart from validating the EU's ambition for 2030, our results indicate that the agreed 62% emissions reduction in the Emissions Trading System and 40% in the Effort Sharing Regulation (compared with 2005 levels) are in line with cost-optimal paths toward the bloc's 55% emissions cuts target by 2030. However, to keep the goal of NZE within grasp, our model ensemble reasonably robustly

Figure 76. Preview of December 2023 Press Release

7.6 April 2024

Title: IAM COMPACT Press Release: April 2024

Headline: Your open access “Energy System and Integrated Assessment Modelling concepts and tools” learning path!

Link: <https://preview.mailerlite.com/f3u2t2k0g6>



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Your open access “Energy System and Integrated Assessment Modelling concepts and tools” learning path!

Now openly accessible on our [Zenodo](#) repository in the form of pptx files and licensed under CC BY 4.0, the first IAM COMPACT energy system and integrated assessment modelling training package provides a number of energy and climate modelling related courses as a customised training portfolio.



The IAM COMPACT training material is the product of collective efforts to generate a set of instructional tools in support of the capacity-building workshops held in Kenya, Ethiopia, and Sri Lanka, and polishing them afterwards. Many teams, from the EU as well as the nations where these workshops were being held, were involved in this endeavor, which required them to individually re-examine and re-work the knowledge produced and stored in various formats and from several angles.

Since the several workshop sessions were held for very different audiences and in quite varied circumstances, re-elaboration was greatly needed for delivering a comprehensive training material that can serve well as the perfect starting point for everyone who wishes to become familiar with ground modelling concepts, tools, and approaches from the modelling ecosystem of the IAM COMPACT project. As such, the IAM COMPACT training material is intended for all users with a technical background, who would like to learn more about, or master, modelling methods in the context of energy availability as well as of mitigation of and adaptation to climate change.

Figure 77. Preview of April 2024 Press Release

7.7 July 2024

Title: IAM COMPACT Press Release: July 2024

Headline: IAM COMPACT at the 17th Annual Meeting of the Integrated Assessment Modeling Consortium (IAMC 2024)

Link: <https://preview.mailerlite.com/f1f2v2l3u4>



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IAM COMPACT at the 17th Annual Meeting of the Integrated Assessment Modeling Consortium (IAMC 2024)



The [Seventeenth IAMC Annual Meeting](#) will be held on November 4-6, 2024 at [Yonsei University, Main Campus](#), in Seoul, South Korea, and IAM COMPACT plans to be there!

Figure 78. Preview of July 2024 Press Release

7.8 October 2024

Title: IAM COMPACT Press Release: October 2024

Headline: Model results validation and vetting app released!

Link: <https://preview.mailerlite.com/q0a5o0a9l9>



Model results validation and vetting app released!

IAM COMPACT has developed validation and vetting checks to be applied to model results that are submitted as part of modelling studies in the context of the project. Validation here refers to checking reporting formats, naming conventions, and self-consistent aggregations, while vetting refers to checking results against certain expected reference values. The project has developed Python packages that can be used to carry out the checks locally (i.e., on the computers of modellers) and will soon be integrated into the I²AM PARIS platform and applied to all IAM COMPACT modelling results uploaded therein.

Validation and vetting app

<https://validation.iam-compact.eu/>

The validation and vetting app is used for performing name-validation and region-mapping on the modelling results of Integrated Assessment Models (IAMs), as well as for vetting results using the latest vetting criteria from the IPCC (currently AR6), and for comparison with harmonisation data (currently, population and GDP). Harmonisation data can be found on Zenodo ([link](#)). Specification of the vetting criteria for IPCC AR6 vetting rules can be found in the IPCC AR6 Working Group III report, Annex III, Table 11 (see [here](#)).

The app is built in Python and Streamlit and will be eventually integrated in I²AM PARIS, an open-access, data exchange platform for modelling results ([link](#)). It is based on a fork [from the I²AM PARIS validation app](#). Installation instructions to run the app locally can be found [here](#).

Figure 79. Preview of October 2024 Press Release

7.9 March 2025

Title: IAM COMPACT Press Release: March 2025

Headline: Stakeholder-driven energy- and climate-economic modelling science: the IAM COMPACT policy response mechanism

Link: <https://preview.mailerlite.com/h6d3z2e4x7>



Stakeholder-driven energy- and climate-economic modelling science: the IAM COMPACT policy response mechanism

Participatory approaches have been argued to bring a more diverse range of views into the integrated assessment modelling (IAM) process, by building a better understanding of the social context and supporting more inclusive decision-making. In IAM COMPACT, we have designed a Policy Response Mechanism (PRM), is a nine-step co-creation process facilitating collaboration among modelling teams and with stakeholders, which runs throughout the project duration in two cycles. The PRM dynamically responds to changing policy priorities, aiming for policy relevance, knowledge exchange, and enhanced trust, by providing different layers of inputs and making modelling socially and politically realistic. Stakeholder engagement in IAM COMPACT is organised into themes (for stakeholders within the EU), which are collaboratively determined within the project, and into regions (for stakeholders outside the EU). For the themes, the aim is to have a broad enough coverage to capture a range of issues, but also sufficiently selective to lead a clear research agenda later in the project. In essence, high-level exchanges with policy stakeholders (forming the Policy Steering Groups) are grouped into proposals for modelling studies, which are in turn grouped into overarching themes and discussed with a wider policy audience (forming the Core Working Groups) selected on geographical and sectoral criteria. The consultative process helps us to evaluate the relevance of policy issues, refine the scope of research questions, and establish a balanced group of stakeholders to participate. One workshop is conducted under each theme, alongside the corresponding Core Working Group, to consult stakeholders on our scenario design and co-define desired outputs as well as a key set of joint input assumptions.

Figure 80. Preview of March 2025 Press Release

7.10 March 2025 - 2nd Press Release

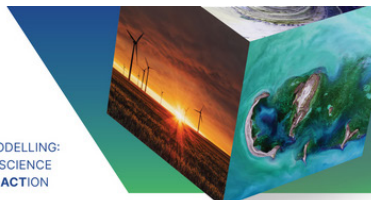
Title: IAM COMPACT 2nd Press Release: March 2025

Headline: Policy Brief "Cost of capital evolution effects on regional mitigation pathways: Financing renewable investments in low- and middle-income countries"

Link: <https://preview.mailerlite.com/w8n8z9x6s5>



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Policy Brief

Cost of capital evolution effects on regional mitigation pathways:

Financing renewable investments in low- and middle-income countries

A recent IAM COMPACT study (available [here](#)) highlights the importance of the realistic representation and expert-driven projection of costs of capital in Integrated Assessment Models.

The development of costs of capital and their role in regional mitigation approaches, particularly in low- and middle-income countries (LMICs), have been explored in a newly released policy brief by IAM COMPACT. Our research examines the impact of financing terms on renewable energy investments and draws attention to necessary policy interventions that can help achieve global decarbonisation goals.

The research emphasises the need for cost-of-capital differentiation across technologies and geographies, demonstrating how financing trends and investment risks shape energy transitions. The research, relying on integrated assessment models (IAMs) and expert survey results, provides long-term projections of how the financing conditions will influence the transition to low-carbon energy systems.

Key Findings:

1. **De-risking renewable investments** can speed up decarbonisation in **Africa, Latin America, and Asia**, increasing investments in wind, solar, and green hydrogen.
2. **Higher investment risks for fossil fuels** would result in worldwide divestment from coal, oil, and gas, **reducing CO₂ emissions** substantially.
3. **Diverging costs of capital between high-income and developing nations** may hinder the adoption of renewable energy in LMICs, entrenching the reliance on fossil fuels.
4. **Cost-of-capital reductions alone are not enough**; additional policy and regulatory interventions are necessary to allow low-cost financing of clean energy transitions.
5. Bridging the financing gap could also **bridge the emissions gap** by as much as 18% in Africa and 6% worldwide by 2050.

Figure 81. Preview of March 2025 2nd Press Release

7.11 April 2025

Title: IAM COMPACT Press Release: April 2025

Headline: Enhancing Renewable Energy System Metrics: Security, Flexibility, and Sustainability

Link: <https://preview.mailerlite.com/p3l2y2e5v4>



Enhancing Renewable Energy System Metrics: Security, Flexibility, and Sustainability

A new IAM COMPACT brief offers critical insights into Europe's transition to a secure, flexible and sustainable renewable energy future.

A new policy brief (available [here](#)), issued by the IAM COMPACT project, highlights key insights from our study on "Enhancing Renewable Energy System Metrics: Security, Flexibility, and Sustainability", which demonstrates that Europe can feasibly transition to a fully renewable energy system—one that's carefully structured to maximise security, resilience and sustainability.

The brief and underlying study calls for an urgent shift in policy frameworks to expand renewable energy assessment metrics beyond cost and emissions, embedding security, resilience, and flexibility as core priorities. It challenges traditional energy modelling and uses sectoral, input-output, and integrated assessment models ([EnergyPLAN](#), [MARIO](#), and [WILIAM](#)) to evaluate three future EU energy futures, including a 100% renewable scenario ("Smart Energy Europe"). Through these scenario analyses, along with extensive stakeholder consultation, it delivers actionable recommendations for designing Europe's future energy landscape.

Key Findings:

1. **Energy independence is achievable:** A 100% renewable EU energy system without relying on imports is technically feasible.
2. **Supply chain security:** Renewable technologies, especially photovoltaics and wind, depend more on European supply chains than fossil fuels do.
3. **Flexibility is essential:** Smart grids, flexible demands like electric vehicles, hydrogen storage, and energy storage technologies should be prioritised.
4. **Material efficiency matters:** Strategic planning can prevent resource shortages and moderate critical material price spikes.

Figure 82. Preview of April 2025 Press Release

7.12 May 2025

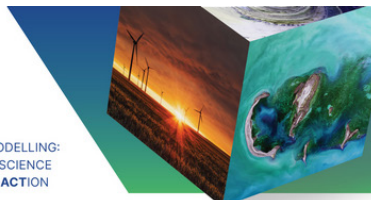
Title: IAM COMPACT Press Release: May 2025

Headline: Tech-Constrained EU Pathways to Net Zero: The Role of Geopolitical Disruptions and Supply Chain Shocks

Link: <https://preview.mailerlite.com/r8o7n5g6s1>



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Tech-Constrained EU Pathways to Net Zero: The Role of Geopolitical Disruptions and Supply Chain Shocks

A new IAM COMPACT brief uses three Integrated Assessment Models (IAMs) to explore how supply chain and geopolitical shocks may disrupt EU decarbonisation pathways.



To meet its net-zero greenhouse gas emissions target by 2050, the EU must rapidly scale up key low-carbon technologies. However, this transition faces growing risks from supply chain disruptions and geopolitical uncertainties.

Our new policy brief (available [here](#)), developed under the IAM COMPACT project's "Global Effects" theme, explores how such challenges may undermine the EU's transition to climate neutrality. Drawing on three leading Integrated Assessment Models (IAMs), the analysis compares a baseline scenario (capturing NDCs and long-term targets) to three alternative pathways that simulate constraints on renewable energy, biomass, and carbon capture and storage, all critical to decarbonisation. Each scenario reveals different vulnerabilities and trade-offs, highlighting where targeted policy interventions are needed to maintain progress toward net-zero goals.

Figure 83. Preview of May 2025 Press Release

7.13 July 2025

Title: IAM COMPACT Press Release: Final Event Invitation

Headline: IAM COMPACT Final Event: Responsive Science in Support of Climate Policy Making

Link: <https://preview.mailerlite.com/v9z2v9z9y3>



Figure 84. Preview of July 2025 Press Release

8 Presentations in policy events and stakeholder workshops

In this section, we list all policy events and stakeholder workshops⁹, which IAM COMPACT participated in or (co-) organised.

8.1 IAM COMPACT in the Energy Modelling Platform for Africa (EMP-A) 2023, 11 April 2023

The main objective of the [Energy Modelling Platform for Africa \(EMP-A\)](#) 2023 was to contribute to creating optimised investments for the energy transition in Africa to meet the continent's growing demand for low-carbon, inclusive, and climate-resilient development pathways whilst accessing its large resource base. It was an excellent opportunity to acquire free training, access to discussion forums, and coaching skills in models and tools for energy planning needs.

EMP-A 2023 took place from 11th April to 28th April 2023 as a hybrid event (online and at the University of Namibia). IAM COMPACT partners from Addis Ababa Institute of Technology (AAiT) and Technical University of Mombasa (TUM) joined the training on CLEWs modelling framework.

⁹ <https://iam-compact.eu/news-events>

8.2 Loss & Damage: it could be your turn next, 5 June 2023

“Loss & Damage: It Could Be Your Turn Next”

World Environment Day, June 5th, 11:00 CEST
Watch on www.youtube.com/@IAMCOMPACT/

#PayUp4LossAndDamage #PollutersMustPay
#LossAndDamageFinanceNow #EndFossilFuels



The IAM COMPACT project has received funding from the European Union's HORIZON EUROPE Research and Innovation Programme under grant agreement No 101056306.



Panelists



Nakabuye Hilda F.



Omar Elmawi



Dr Ioannis Tsipouridis



Prof Haris Doukas



Led by the United Nations Environment Programme (UNEP) and held annually on 5 June since 1973, [World Environment Day](#) is the largest global platform for environmental public outreach and is celebrated by millions of people across the world.

In this context, IAM COMPACT presented: “Loss & Damage: it could be your turn next”, on World Environment Day, June 5th 2023, 11:00 CEST.

Prof. Ioannis Tsipouridis from Technical University of Mombasa and Prof. Haris Doukas from National Technical University of Athens meet climate activists Omar Elmawi & Nakabuye Hilda F. to discuss this critical issue.

The conversation was streamed live and is now archived on IAM COMPACT's [YouTube channel](#).



8.3 Global Change Analysis Model (GCAM) Annual Meeting 2023, 6-8 June 2023



The Joint Global Change Research Institute's next annual GCAM Community Modeling Meeting was held June 6-8, 2023 virtually. The GCAM Community Modeling Meeting provided a forum for the GCAM community to hear about the latest developments and current uses of GCAM. For those new to GCAM, this workshop continued to serve as an excellent in-depth opportunity to learn and gain a better understanding of the model.

More information on the model can be found [here](#).

8.4 Core Working Groups workshops: “Industry & Innovation”, 21 June 2023



The workshop, centred on the theme of Industry & Innovation, aimed to facilitate collaboration between the IAM COMPACT modelling team and policymakers, industry, and civil society representatives. By engaging with senior energy and climate policymakers, we have identified key priorities for Europe's industrial sector. CWG's contributions are envisaged to directly influence our research.

During this workshop, we sought valuable insights on our research agenda, realistic scenario design, and potential applications of our analysis. We discussed two related modelling studies:

1. What are the implications of EU industry decarbonisation, considering possible off / re-shoring scenarios? This study is led by Wuppertal Institute.
2. What is the contribution of earlier stage technologies if they undergo rapid cost reductions? This study is led by Imperial College London.

At the start of the workshop, a brief introduction of IAM COMPACT as well as the aims of the workshop were discussed by Bruegel. Then, study leads briefly presented the background and approach of both studies, before splitting into two break-out rooms.

The qualitative and modelling analysis of study will be featured in the update of Deliverable *D4.7: Sectoral and cross-sectoral analysis*, which is due on February 2024 and will be available on our website. Extensive documentation of the discussion among stakeholders and IAM COMPACT partners will be featured in *D2.4 - Proceedings of Stakeholder Interactions*.

8.5 ICTP Joint Summer School on Modelling Tools for Sustainable Development, 3-14 July 2023

The [ICTP Joint Summer School on Modelling Tools for Sustainable Development 2023](#) was held in July (3-14/07/2023) and IAM COMPACT was there to contribute to the teaching activities.

The school was split in two parts: a) online training on the tool applied (26/06 – 30/06) and b) hands-on session to conduct analyses on country-specific case studies, with assistance being provided from trainers (hybrid; 03/07 – 13/07). Through the training, participants have the chance to start developing capacity from scratch on new modelling tools within their institutions and with stakeholders. There were nine tracks listed below, each focusing on different tools:

- OnSSET/The Global Electrification Platform
- Energy and Flexibility Modelling: [OSeMOSYS](#) & FlexTool
- Financial Analysis of Power Sector Projects using the FinPlan Model
- Energy demand assessment and scenarios: MAED and EBS tools
- Introduction to [CLEWs](#)
- Energy Access Explorer: A Data-driven, Integrated and Inclusive Approach to Planning for Achieving Universal Access to Energy for Equitable Development
- The Net Zero Playbook
- Geospatial data, best practices for collection and management
- Input-Output-based Life-Cycle Assessment with [MARIO](#)
- Geospatial Clean Cooking access modelling, using OnStove

IAM COMPACT partners from POLIMI and KTH taught MARIO, OSeMOSYS & CLEWs tools & pilot countries participated in the summer school.

See [here](#) for more information on the summer school.

8.6 Summer School on Integrated Assessment Models, 3-7 July 2023

The [NAVIGATE](#) and [ENGAGE](#) projects, funded by the European Union's Horizon 2020 research and innovation programme, launched a [Summer School on Integrated Assessment Models](#) aimed at providing advanced training for young international scholars, advanced PhD students and early postdoc fellows, working on integrated assessment models. The Summer School was organised by the RFF-CMCC European Institute on Economics and the Environment (EIEE) and took place at Lake Como, Villa del Grumello, from 3rd to 7th July 2023.

IAM COMPACT partners BC3 & E3M joined the Summer School with the capacity of doctoral students and faculty, respectively.



8.7 Core Working Groups workshop: “Optimal Transition”, 18 July 2023



The workshop, centred on the theme of Optimal transition, aimed to facilitate collaboration between the IAM COMPACT modelling team and policymakers, industry, and civil society representatives. By engaging with senior energy and climate policymakers, we have identified key priorities for achieving an orderly transition that addresses current challenges to both EU policy and the materialisation of greener infrastructure. CWG’s contributions are envisaged to directly influence our research.

During the workshop, we sought valuable insights on our research agenda, realistic scenario design, and potential applications of our analysis. We discussed two related modelling studies:

1. How does the implementation of the updated draft National Energy and Climate Plans / Fit-for-55 compare to the cost-optimal EU approach? This study is led by **BC3**.
2. How can we evaluate the effects of energy system flexibility measures? This study is led by **Aalborg**.

At the start of the workshop, a brief introduction of IAM COMPACT as well as the aims of the workshop were discussed by Bruegel. Then, study leads briefly presented the background and approach of both studies, before splitting into two break-out rooms.

The qualitative and modelling analysis of Study 1 will be featured in the update of Deliverable *D4.5 - National, regional, global mitigation pathways*, which is due on February 2024, while of Study 2 in *Deliverable D4.9 - European sub-national deep dives* due on January 2024, and both will be available on our website. Extensive documentation of the discussion among stakeholders and IAM COMPACT partners will be featured in *D2.4 - Proceedings of Stakeholder Interactions*.

8.8 IAM COMPACT capacity development activities in Mombasa (Kenya), 29 August-1 September 2023

The workshop was organised in the context of the IAM COMPACT project and hosted by RECCReC (Renewable Energy and Climate Change Research Centre) at the Technical University of Mombasa (TUM), with notable contributions by Politecnico di Milano (POLIMI), KTH Royal Institute of Technology (KTH), and National Technical University of Athens (NTUA). It was split into three parts, aimed at students; policymakers; and stakeholders and was held from 29th August to 1st September 2023.

8.8.1 Students' Workshop, 29 August-30 August 2023



Figure 85. Students' Workshop, 29 August 2023, at TUM, Mombasa, Kenya

The **first day** kicked-off with an introduction to energy system modelling, covering a brief history of energy modelling and basic aspects of Energy Optimisation Models (reference energy system, classification, resolution, etc.). The session continued with a hands-on exercise, in which the students explored the implications of three different scenarios: imposing a carbon tax, introducing renewable incentives, and constraining land availability, and discussed how the least cost planning changes in each scenario.

The next session introduced Input-Output modelling, explaining the notions of industrial ecology, quantitative impact assessment, systems thinking, and the Leontief model. Finally, the day concluded with a hands-on exercise on Water management using Input-Output tables, where students were asked to introduce three different shocks and assess the change in economic and environmental impacts.

The **second day** expanded the scope and introduced the water, energy, and food nexus. The students were introduced to the concept of integrated analysis, where a CLEWs model for Kenya was presented, before shifting to a global approach through IAMs. WILIAM and GCAM models were briefly explained through a nexus lens, and examples of their applications for SDG analysis were shown.

The students were then presented with a "Farming Optimisation Game" (Martindale, Leigh. (2023, May 8). Model Optimization: An IRL Farming simulation example. Zenodo. <https://doi.org/10.5281/zenodo.7908954>) and were asked to maximise profits and meet the increasing food demand over three years while considering the ecological

impact of their farming choices. The game enhanced students' participation, and some of the teams presented their results at the end of the session.



Figure 86. Students' Workshop, 30 August 2023, at TUM, Mombasa, Kenya

The next presentation introduced the notions of scenarios, their role in energy modelling, the different types of scenarios and how they can be used to capture uncertainty. An [example](#) of scenario construction for Eastern Africa was then presented, before moving to a hands-on exercise where students were asked to design their own scenarios, either on pen and paper in a Kenyan context or in a global context by using the [EN-ROADS](#) tool. Teams were then asked to present their scenarios – e.g., one team featured just redistribution of trans-boundary resources for food and energy supply in Eastern Africa.

The workshop ended with a sample CLEWs model application, which included some features relatable to Kenya's energy, water and food supply chains. The students were provided with the OSeMOSYS model, and had the chance to run it and modify input parameters to create different scenarios. Finally, those interested were prompted to take "Introduction to CLEWs" [course](#). The next steps will include the formation of a modelling class at TUM supervised by Ms. Salsabila Abdulhalim, in addition to biweekly meetings with KTH to support progress.

8.8.2 Stakeholders' Workshop, 31 August-1 September 2023

The workshop aimed at demonstrating the use of open source and accessible energy system, economic and environment modelling tools largely used by the scientific community and by the UN to support energy and environment policy goals in Kenya. As such, it dedicates particular attention at the planning needs of Kenya - brought forward through discussion with the participants - and how they may be met with existing and expanded modelling capacity in the country.



Figure 87. Stakeholders' Workshop, 31 August 2023, Mombasa, Kenya

The **first day** kicked-off with a presentation by Bruegel, showcasing the use of energy system models & scenarios in policy, their relevance, success cases, and examples. Participants discussed how subsidies and energy prices in the EU can affect prices in other regions, and whether EU's energy policy could lower interest rates in developing countries. Stakeholders' noted that Kenya should pose its own climate agenda and sustainable financial model, as external solutions risk being seen as a new form of climate neo-colonialism.

The next session featured Mr. Martin Mutembei from the Climate Compatible Growth Programme; he presented an overview of Kenya-CCG initiatives, including energy planning support, national ownership, the creation of a whole energy system modelling toolkit for Kenya, and capacity development activities through Summer Schools, and OpenLearn courses.

The next presentation featured Ms. Salsabila Abdulhalim, who will lead the Kenyan team of IAM COMPACT for the creation of an open-access model, presenting a Kenyan case study on integrated policy planning using the CLEWs nexus framework which was created during her participation in ICTP Joint Summer School for Sustainable Development 2023. The results were preliminary, as more datasets will feed into the model, building a more advanced representation of Kenya's energy system.

The **second day** kicked-off with a presentation of interlinkages among water, energy, land use, and climate, and the need for a "nexus" approach to ensure policy coherence. A simplified diagram of a climate-land-energy-water system model was constructed step-by-step to demonstrate these interconnections. Next, Mr. Samson Soshyo, TUM lecturer, presented a conference [paper](#) on an optimised hybrid wind-solar energy system for irrigation pump load sites in Kenya, and together with Mr. Absae Sedah from Kenya's Meteorological Department, discussed the possibility for data exchange with IAM COMPACT, especially on climate and future projections.



Figure 88. Stakeholders' Workshop, 01 September 2023, Mombasa, Kenya

The next session provided an overview of integrated assessment models (IAMs) and how IAM COMPACT aims to use and develop IAMs to support the assessment of global climate goals, progress, and feasibility space, as well as the design of the next round of NDCs and policy planning beyond 2030. It then focused on Kenya's NDC targets, as well as future challenges for the country's planned energy and climate transition. Participants discussed the need to prioritise local challenges, placing afforestation as the most pressing issue, followed by lack of sustainable finance and widespread [corruption](#) – as most investments in infrastructure are currently driven by China in the form of loans, causing also "[institutional degradation](#)".

The workshop ended with a hands-on exercise, using the CLEWs [interface](#) as a tool to inform debates on sustainable development policies and the interlinkages among climate, land, energy and water. Participants were asked to implement three policy interventions using the OSeMOSYS modelling tool in a Mauritius case study, discuss the benefits and impacts of each policy, analyse their food-energy-water implications and propose mitigation measures to address any negative impacts from each policy.

8.9 Climate Targets 2040: Bridging modelling and policy, 13 September 2023



The EU must declare its 2040 climate targets by the beginning of 2024, as required in the European Climate Law. To inform, justify and communicate the targets, policymakers will rely on energy, climate and economic modelling of the impacts of various emission mitigation pathways. The main type of models used to assess the trade-offs related to different pathways are detailed-process Integrated Assessment Models (IAMs), contributing to IPCC and other scientific reviews.

At this event, the panellists, which include our partner Bruegel, European policymakers and modellers involved in leading research projects on modelling climate mitigation discussed the considerations for the 2040 targets and how modelling can support policymaking in this space. Emerging challenges in the climate policy space were also discussed as well as the potential model development to respond to the changing needs of policymaking.

You can watch the discussion [here](#).

8.10 Core Working Groups workshop: “Global Effects”, 26 October 2023



GLOBAL EFFECTS WORKSHOP

26 October 2023, at 10.00-11.30 CEST

Virtual (Microsoft Teams)

IAM COMPACT, a Horizon Europe integrated assessment modelling project, is inviting policymakers, industry and civil society representatives to discuss two related research studies:

1. How could **geopolitics** affect decarbonisation pathways?
 - Exploring constraints on supply of materials needed for decarbonisation.
2. How do **interest rates** influence decarbonisation pathways?
 - Exploring effects of differentiated cost of capital on emissions mitigation.

The IAM COMPACT project has received funding from the European Union's HORIZON EUROPE Research and Innovation Programme under grant agreement No 101056306.

The Global Effects workshop, exploring the impact of financial and political issues on global decarbonisation, aimed to facilitate collaboration between the IAM COMPACT modelling team and policymakers, the clean energy sector and civil society representatives.

During this workshop, we sought valuable insights on our research agenda, realistic scenario design, and potential applications of our analysis. By engaging with senior energy and climate policymakers, we have identified key research questions for assessing the impact of global effects such as geopolitical tensions and interest rates on decarbonisation pathways. Expert contributions will directly influence our research.

The Global Effects workshop discussed two related modelling studies:

1. How could geopolitics and technological limitations affect decarbonisation pathways? This study is led by **E3M**.
2. How do interest rates influence global decarbonisation pathways? This study is led by **NTUA**.

At the start of the workshop, a brief introduction of IAM COMPACT as well as the aims of the workshop were discussed by Bruegel. Then, study leads briefly presented the background and approach of both studies, before splitting into two break-out rooms.

The qualitative and modelling analysis of the Geopolitics study will be featured in the deliverable *D5.4 - Modelling out-of-ordinary extremes* while of the Interest Rates study in *D5.6: Behaviour, social and disruptive innovation*. Both studies are due on February 2024 and will be available on our website. Extensive documentation of the discussion among stakeholders and IAM COMPACT partners will be featured in *D2.4 - Proceedings of Stakeholder Interactions*.

8.11 Core Working Groups workshop: “Behavioural Change”, 31 October 2023



The Behavioural Change workshop explored the decisions of economic agents in integrated assessment models, aiming to facilitate collaboration between the IAM COMPACT modelling team and policymakers, industry associations and civil society representatives.

During this workshop, we sought valuable insights on our research agenda, realistic scenario design, and potential applications of our analysis. By engaging with senior energy and climate policymakers, the workshop directly contributed to IAM COMPACT’s study “What are the economic impacts (rather than the cost or effectiveness of policy implementation) of a given behavioural change?” - led by **UVa** and **BC3**.

Topics for discussion:

- Most anticipated behavioural changes
- Potential barriers to adoption of cleantech and/or sustainable lifestyles
- Beyond raising awareness: potential structural change requirements to enable behavioural change

At the start of the workshop, a brief introduction of IAM COMPACT as well as the aims of the workshop were discussed by **Bruegel**. Then, study lead (UVa) briefly presented the motivation and the broad scenario design. The session was facilitated via Miro, which helped us gather the necessary feedback.

The qualitative and modelling analysis on behavioral change will be featured in Deliverable *D5.6 - Behaviour, social and disruptive innovation*, which is due on February 2024 and will be available on our website. Extensive documentation of the discussion among stakeholders and IAM COMPACT partners will be featured in *D2.4 - Proceedings of Stakeholder Interactions*.

8.12 National Core Working Groups: India, 6 November 2023

During the first week of November 2023, IAM COMPACT held an in-person stakeholder workshop in Ahmedabad, Gujarat, India. The objective of the workshop was to discuss the current trends in India's climate efforts as well as elicit feedback from key stakeholders and draw insights from national experiences to understand the possible policy priorities to attain net-zero emissions by 2070, as committed by the country's Prime Minister, Shri Narendra Modi, at COP26 in Glasgow.

India has pledged to become net zero by 2070. India's NDC commitment has three main elements:

- an emissions-intensity target of 45% below 2005 levels by 2030;
- a target of achieving 50% cumulative electric power installed capacity from non-fossil fuel-based energy resources by 2030; and
- a carbon sink of 2.5 to 3 GtCO₂eq. through additional forest and tree cover by 2030.

The diversity of stakeholders participating in the event highlighted that there is a need to prioritise the decarbonisation of India's building sector as there is a huge policy gap in terms of both design and implementation. Its building space is expected to increase by more than 2.5 times by 2050. Additionally, there is a lack of scientific literature and peer-review research studies focussing on decarbonisation of the country's residential and commercial building stock aligned with the country's updated NDC commitments to the UNFCCC.

The workshop aimed to promote an open discussion between government officials, industry leaders, researchers, and academia. It featured an open discussion between various stakeholders, including four government officers, ten industry leaders, ten researchers, and six academics.

Key research questions emerging from the event oriented towards better understanding the potential action space and policy priorities for decarbonising India's building sector towards net zero emissions by 2070.

8.13 IAM COMPACT side-event at COP28 in Dubai, 5 December 2023



The EU has committed to becoming a net-zero economy by 2050, with many member states having integrated this goal into national strategies. The bloc's path towards delivering on this ambition, however, remains unclear.

IAM COMPACT co-hosted a panel discussion at the Greek Pavilion at COP28, in Dubai, alongside the Horizon Europe [DIAMOND](#) project and the [Hellenic Society for the Environment and Cultural Heritage](#), aiming to explore the challenges ahead for the EU, drawing on the findings of our flagship [study](#) published in Joule.

The discussion, which took place on December 5 at the Greek Pavilion (15.00 - 16.00 GMT+4) first explored the feasibility of key aspects of the Fit for 55 policy package and question the energy-system requirements to reaching net zero by 2050, across sectors and member states. Special attention was given to strategic decisions that the EU must make today, especially relating to technological investments and associated enabling environments, as well as to key intermediate milestones on the way to net zero.

In turn, the panel discussion dived deeper into the role of carbon capture and storage (CCS) in abating residual fossil fuels (based on [this working paper](#)), as well as into that of natural gas, notably in the light of the energy crisis in Europe (based on [this study](#) and the discussion [here](#)).

The key objectives of this COP28 side-event were to (a) highlight potential challenges to the EU's path to net zero, (b) fuel the policy debate on critical technologies, and (c) share knowledge.

The panel discussion was moderated by Prof. Ryna Yiyun Cui, (*University of Maryland, US*) and included the following interventions:

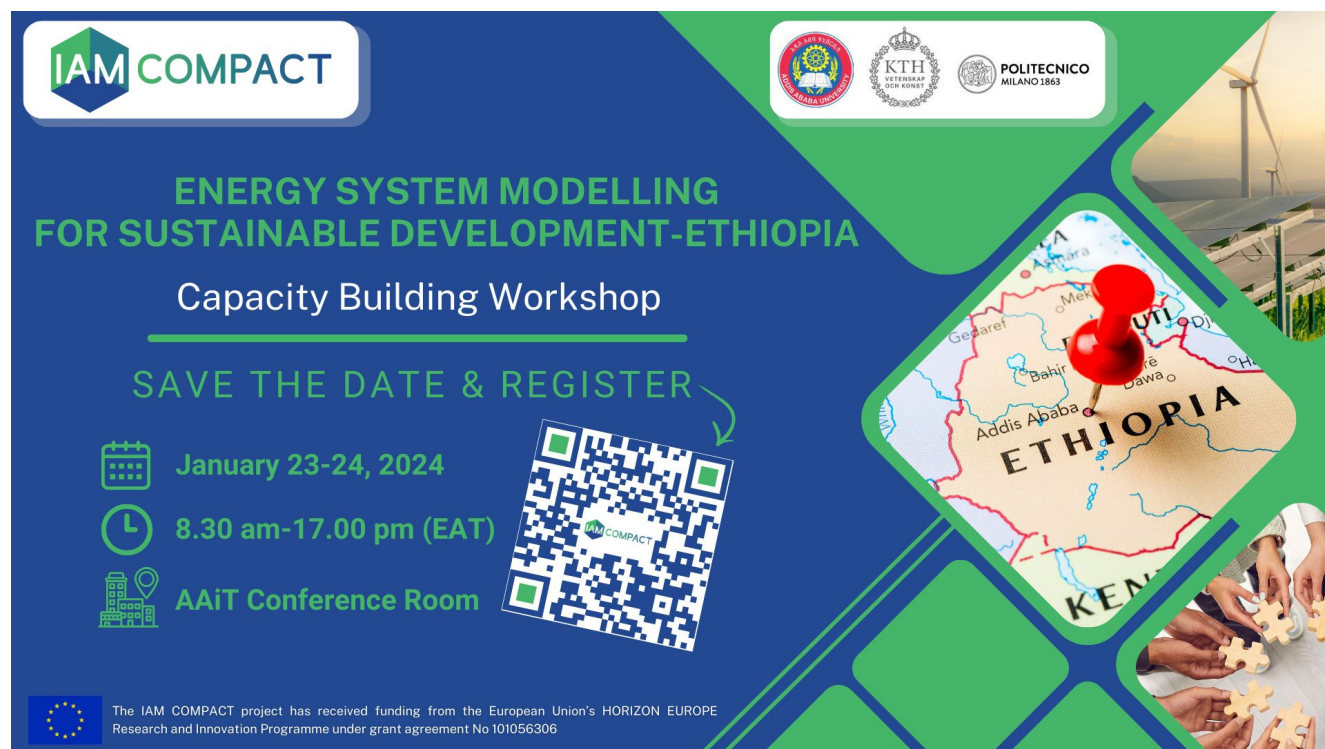
- **"Paving the way to net zero in the EU: key technologies, strategic decisions, and a roadmap"**
Speaker: Haris Doukas, *Professor at the National Technical University of Athens (NTUA), President of the Society for the Environment and Cultural Heritage (ELLET) Energy Council, Mayor-Elect of the Municipality of Athens, Greece.*
- **"Defining 'Abated Fossil Fuels' and identifying their role in the EU's long-term ambition"**
Speaker: Alaa Al Khourdajie, *Research Fellow at the Department of Chemical Engineering of Imperial College London (Imperial)*
- **"The role of gas in the EU's net-zero trajectory: thinking in the context of the energy crisis"**
Speaker: Steve Pye, *Assoc. Professor at the UCL Energy Institute (University College London)*

You may find more information in the attached agenda.

DOWNLOADS

[COP28 side event DIAMOND COMPACT 1.pdf](#)

8.14 IAM COMPACT capacity development activities in Addis Ababa (Ethiopia), 23-24 January, 2024



**ENERGY SYSTEM MODELLING
FOR SUSTAINABLE DEVELOPMENT-ETHIOPIA**

Capacity Building Workshop

SAVE THE DATE & REGISTER

 **January 23-24, 2024**

 **8.30 am-17.00 pm (EAT)**

 **AAiT Conference Room**







 The IAM COMPACT project has received funding from the European Union's HORIZON EUROPE Research and Innovation Programme under grant agreement No 101056306

The IAM COMPACT capacity building workshop "Energy Systems Modelling for Sustainable Development - Ethiopia" took place on January 23-24, physically, at the the conference room of Addis Ababa Institute of Technology (AAiT), Addis Ababa, Ethiopia.

The workshop aimed to equip participants with the basic energy modelling concepts, advanced energy modelling, and policy insight developments to support data-driven energy planning and policymaking, as well as to enhance the networking of national modellers in Ethiopia. It focused on existing local modelling knowledge and capacity gaps and hence bolsters in promoting fit-for-purpose and sustainable modelling knowledge transfer in our capacity development activities on the selected models.

The **first day**, aimed at stakeholders and modelling beginners, provided the fundamental knowledge and understanding of the principles of national energy planning, to understand the theoretical basis and applied knowledge of energy system modelling, be informed of the policy and the regulatory framework of Ethiopia's energy sector, and learn how to use scientific results to support evidence-based policy making. It included:

- a presentation of IAM COMPACT and each modelling ecosystem (NTUA)
- an introduction to energy systems modelling approaches and taxonomy (POLIMI, KTH)
- the model selection framework through a brief overview of commonly used tools in Ethiopia (AAiT)
- and an introduction to the Global Electrification Platform¹⁰ (POLIMI)

¹⁰ <https://electrifynow.energydata.info/>



Figure 89. Capabity building workshop, 23 January 2024, at AAiT, Addis Ababa, Ethiopia

The **second day**, aimed at advanced modelling users, deepened the concepts of the energy system modelling sessions of Day 1, through using a hands-on project work on a specific modelling tool (OnSSET-MicroGridsPy), whereby the model set-up/update is guided step-by-step with the trainers (POLIMI). It consisted of:

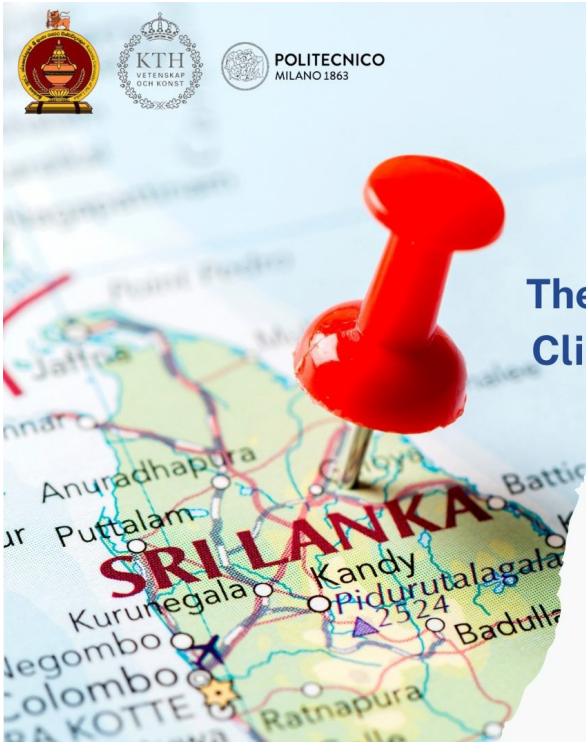
- an introduction to MicroGridsPy, and model linkages of OnSSET-MicroGridsPy (POLIMI)
- and hands-on exercises on OnSSET (POLIMI)



Figure 90. Capabity building workshop, 24 January 2024, at AAiT, Addis Ababa, Ethiopia

The workshop was organised by Addis Ababa Institute of Technology, KTH Royal Institute of Technology, Politecnico di Milano, and the National Technical University of Athens, and hosted by AAiT.

8.15 IAM COMPACT capacity development activities in Mihintale (Sri Lanka), 30 January, 2024







POLITECNICO
MILANO 1863



CAPACITY BUILDING WORKSHOP

The Integrated Assessment Modelling of Climate and Energy Policies in Sri Lanka

SAVE THE DATE & REGISTER



JAN 30, 2024



09.00-17.00



Online





The IAM COMPACT project has received funding from the European Union's HORIZON EUROPE Research and Innovation Programme under grant agreement No 101056306

The IAM COMPACT capacity building workshop "Integrated Assessment Modelling of Climate and Energy Policies in Sri Lanka" will take place on January 30, 2024, 09:00 - 17:00 IST (03:30 - 11:30 UTC), online.

The workshop aims to introduce participants to the concept of integrated assessment modelling (IAM) for enhancing the comprehensibility of Sri Lanka's ambitious energy and climate policies. As an island nation, Sri Lanka faces critical interdependencies between climate, energy, water, and land-use systems. It focuses on equipping participants with the skills and knowledge to utilize IAMs as powerful tools for understanding these interlinks and informing improved policy decisions for sustainable development in Sri Lanka.

It is organised by Rajarata University of Sri Lanka, KTH Royal Institute of Technology, Politecnico di Milano, and National Technical University of Athens.

8.16 Modelling approaches to support Kenya's sustainable development, 12 February 2024

This course is organised and led by the Technical University of Mombasa, with contribution of trainers from the Technical University of Mombasa, Politecnico di Milano, KTH Royal Institute of Technology, National Technical University of Athens, and Strathmore University.

Objectives and contents of the course

The course covers multiple dimensions of sustainable development, ranging across the environmental, economic and social spheres. It aims to provide the students with theory and practice on the use of modeling tools to analyse the interactions between climate, energy, land use, water supply and the national economy.

It is structured into a series of weekly online sessions guided by teachers and related weekly home assignments. Throughout the course, the students will also work on a modelling project in groups.

Learning outcomes

By the end of the course, the students will be able to:

- Evaluate common energy, economy, environment systems modeling and scenario analysis approaches and critically discuss their key strengths and limitations in addressing Sustainable Development issues.
- Analyse through modelling and scenario techniques various sample national development situations and appropriately distil insights, given limited and uncertain information.
- Design and construct a thorough and detailed energy-environment-economy analysis of Kenya with modelling approaches learnt during the course, including independent data processing, problem definition, generation of solutions and interpretation of the results in light of the country's sustainable development challenges.

Duration

Approximately 23 two-hour sessions, starting February 12th, 2024.

Registration and achievement

The course is intended for students at TUM who had participated in our capacity development workshop back in August 2023. Registration information and the course agenda is available in the communication sent to students. Between the classes, the home assignments and the project work, the overall effort required will amount to ca 160 hours over the course of six months, the equivalent of 6 ECTS.



8.17 Advanced Energy Systems Analysis on the EnergyPLAN model, 22 April - 14 May 2024



AALBORG UNIVERSITY
DENMARK

Doctoral School of the Technical Faculty of IT and Design, Aalborg University

In the spring of 2024, IAM COMPACT partner Aalborg University hosts its annual EnergyPLAN PhD course in Denmark. The course has been conducted every year since 2005. It gives an introduction to advanced energy system analysis using the EnergyPLAN model.

The course consists of onsite lectures taking place in Aalborg on 22-25 April and online sessions on 30 April, 7 May and 14 May 2024. Once you have completed the course, you will receive a course certificate.

Registration and payment must be completed [here](#) before 1 April, 2024.

After the course the participants are expected to be able to understand methodologies of advanced energy system analysis and to be able to use the EnergyPLAN computer model as a tool in making energy system analysis.

The course is conducted as a combination of lectures and computer workshops of a total of 4 days (32 hours) and assignments of a total of 6-7 days (52 hours). Results of assignments will be presented by the participants.



8.18 IAM COMPACT at ENCLUDE General Assembly, 27 May 2024



IAM COMPACT project participated in the General Assembly of Horizon 2020 project Energy Citizens for Inclusive Decarbonization ([ENCLUDE](#)), a project which aims to help the EU to fulfill its promise of a just and inclusive decarbonization pathway through sharing and co-creating new knowledge and practices that maximize the number and diversity of citizens who are willing and able to contribute to the energy transition.

ENCLUDE colleagues presented their progress with regards to WP5 - The impact of energy citizenship in decarbonization pathways. Specifically, they enhanced ENCLUDE's modelling ensemble and employed it to extract insights regarding the decarbonisation potential of energy citizenship at the local level. Specifically, to simulate the different scenarios, two (2) models were employed, namely: ANIMO (grAssroot innovatiON diffu-sion MOdel) and DREEM (Dynamic high-Resolution dEmand-side Management).

IAM COMPACT emphasised the role of stakeholders in the emergence and consolidation of energy communities. We were also inspired from the concept of energy cultures addressing their priorities into different decarbonisation scenarios, as this micro-scale methodology could better inform modelling practices and future pathways.

8.19 IAM COMPACT at the Energy Modelling Platform – Joint Global Training School 2024 (EMP-G), 12-23 August 2024



The EMP-G training school, developed with UN DESA, IAEA, UNDP, IRENA, The World Bank Group, SEforALL, WRI, Imperial College London, the OpTIMUS community of practice, and the Climate Compatible Growth, has the main goal of creating a space where free trainings, discussions and cooperation can create awareness, arise interest, and teach models and tools needed for a sustainable planning.

This year's EMP-G was held from 12th to 23rd August, with colleagues from KTH and TUM taking part in these trainings to skill up in CLEWs modelling framework, supporting the capacity building in southern countries. Additionally, KTH organised a new "train-the-trainer" program, on behalf of the IAM COMPACT project, and in collaboration with CCG and RE-INTEGRATE. Training trainers is considered by all to be at the core of capacity development and knowledge sharing, and a fundamental step to build communities of practice.



8.20 IAM COMPACT at Clustering Event for Horizon Europe: Cluster 5 - Destination 1, 10 October 2024



CINEA, together with DG RTD will organise a clustering event for projects in Cluster 5 Destination 1. This will be half a day virtual event for 9 Horizon Europe projects, oriented to policy makers in Commission.

The event aims at conveying policy relevant messages from the research projects to EC staff and EC policy officers. It will be focused on policy relevant updates to EC staff, highlighting the latest scientific developments by projects of interest to the COP and/or EU climate policy agenda.

Our colleague Dirk-Jan van de Ven (BC3) has been invited to present an IAM COMPACT study on Sustainable Development Goals, with the aim to provide updates on significant findings and understand how these advancements could influence climate policy.

The event will take place online, on Thursday 10 October 2024.

Study scope:

The study explores the optimisation of sectoral mitigation efforts to achieve Paris Agreement targets while considering multiple Sustainable Development Goals (SDGs). Key findings highlight that achieving stringent climate targets (1.5°C) reduces flexibility in sectoral prioritisation compared to less ambitious targets (2°C). The study evaluates the impact of mitigation across various sectors (energy, industry, transport, AFOLU) on five SDG indicators: food security, health, water scarcity, economic growth and terrestrial biodiversity. Using integrated assessment models, it identifies sectoral trade-offs and synergies, demonstrating that deeper mitigation limits flexibility and often creates conflicts between SDG outcomes. For instance, transportation sector mitigation benefits health but may impact economic growth and water resources. The results provide policymakers with insights for prioritizing sectors to balance climate goals with SDG targets.

Main policy relevant message:

Optimising sectoral contributions for Paris-compatible emission budgets over multiple SDG Sustainable Development Goals (SDGs) trade-offs shows that deeper mitigation stretches the limits in most sectors, decreasing flexibility in optimising sectoral mitigation over SDGs.

8.21 Core Working Group workshop: "EU Decarbonisation in the global economy," 28 November 2024



EU Decarbonisation in the global economy

The workshop explored EU Decarbonisation in the Global Economy, focusing on how the EU's trade and climate finance decisions influence its decarbonisation efforts and global impact. The workshop outcomes will shape how we use the project's Integrated Assessment Models (IAMs) to provide policy-relevant insights, and brought together policymakers, civil society, and industry representatives to collaborate on policy-driven modelling.

During this workshop, we sought valuable insights on our research agenda, realistic scenario design, and potential applications of our analysis. By engaging with senior energy and climate policymakers, we have identified key research questions for assessing the impact of EU decarbonisation in the global economy. Expert contributions will directly influence our research.

The workshop discussed two related modelling studies:

1. How do global trade dynamics and policy frameworks impact the EU's decarbonisation efforts and green technology transition and cooperation, in a scenario of increased trade and economic tensions? This study is led by **Imperial**.
2. Enabling governance structures for (international) climate finance This study is led by **NTUA**.

At the start of the workshop, a brief introduction of IAM COMPACT as well as the aims of the workshop were discussed by Bruegel. Then, study leads briefly presented the background and approach of both studies, before splitting into two break-out rooms.

Room 1: Trade

Topics for discussion:

- What are the expected short- and long-term impacts of restricted trade with China and the USA on the

EU's decarbonisation efforts? Which indicators are of most interest to illustrate them?

- What countries are best suited to partnering with the EU on green technology? - In other words, who else is suitable for supplying key green technologies? - Latin American countries, India, and Indonesia? - Are countries that are closer geographically more suitable partners?
- What are the most critical uncertainties in these scenarios that should be addressed in the results' discussion? How could this inform policymaking?

Q1: What are the expected short- and long-term impacts of restricted trade with China and the USA on the EU's decarbonisation efforts? Which indicators are of most interest to illustrate them?



Q2: Which countries or regions should the EU prioritise as alternative partners for green technology imports, and why? How important is geographic proximity versus production capability?



Q3: What are the most critical uncertainties in these scenarios that should be addressed in the results' discussion? How could this inform policymaking?



Key takeaways:

- Impact of restricted trade: consumer will bare the costs
- More manufacturing in EU means lower emissions (CO2 intensity of grid)
- Consumers usually pay the costs of tariffs. Affects affordability and accessibility to tech
- Reduced trade dependencies might lead to improved circularity/efficiency
- Geography matters less than the carbon intensity of the product itself and skills in the countries
- More important to consider renewable resources in producing countries
- Need to consider macroeconomic factors in partner countries and associated policy support needed
- Include technological learning in IAMs

Room 2: Climate Finance

Topics for discussion:

- How could the NCQG ensure alignment with the priorities and needs of vulnerable and developing countries (including in adaptation financing)?
- How should the climate finance system change, in order to align it with the investments and actions necessary to deliver the goals of the Paris Agreement?
- What concrete policy instruments could prove key to address fiscal challenges in developing nations and help provide the necessary surge in climate finance flows onwards?

Q1: How could the NCQG ensure alignment with the priorities and needs of vulnerable and developing countries (including in adaptation financing)?



Q2: How should the climate finance system change, in order to align it with the investments and actions necessary to deliver the goals of the Paris Agreement?



Q3: What concrete policy instruments could prove key to address fiscal challenges in developing nations and help provide the necessary surge in climate finance flows onwards?



On NCQG:

- Stakeholders noted that Q1 already assumes that priorities and needs of vulnerable and developing countries are known and defined, when in fact they are usually assumed. A commonly accepted definition of vulnerability could help.
- One key aspect of NCQG could focus on resolving accounting issues of what is considered "climate

finance”, and deep dive on the climate finance gap and the domestic financial capacity of recipient countries with the aim to explore what can be provided domestically and what should be provided from international sources.

- A link among national, regional, and global funds was proposed, to tackle overlapping. Explore potential need for reallocation between funds.
- Good starting point: Climate Policy Initiative (top-down & bottom-up needs, climate finance flows sources & allocation)
- The types of climate finance available vary from grants and concessional loans, to guarantees and private equity. The architecture has differing structures of governance, modalities and objectives. While the transparency of climate finance programmed through multilateral initiatives is increasing, detailed information on bilateral initiatives, regional and national funds is often less readily available, and fair distribution mechanisms are needed based on existing networks among countries.
- On the role of EU, more stringent regulations within the EU funding framework were also proposed, given the lack of observed commitment. An EU fund could go beyond making

On financial system changes:

- Good starting point for the study: evaluation reports of existing funds (e.g., Green Climate Fund)
- Japan’s Climate Transition Bonds were proposed as a good practise. Not only companies but also countries can explore such mechanisms.
- Tradable options may enable trust in carbon credits (see Pilot Auction Facility)
- The potential of taxonomies could also be explored could help private sector categorise activities/projects.
- They also identified issues of lumping together different sources of finance that are not equally efficient, which must be resolved. The role of smaller actors (development banks) should also be enhanced, as well as the coordination among finance providers.
- The European Hydrogen bank was proposed as a good practice on financial system change.
- Stakeholders agreed that a potential global taxation scheme will be blocked by G20. For the EU, budget negotiations on the next EU’s Multiannual Financial Framework (MFF) are expected to start in the second semester of 2025, and are binding.

On policy instruments:

- Results-based finance
- Experts proposed fund pulling from companies emitting more.
- Scoping the potential of a CBAM-type of policies for developing countries
- Debt-for-climate swaps
- Decarbonising industries in dev countries in each step of the value chain through financial instruments
- Look into EU funds to see which the usual recipient countries are, and flesh out networks of climate finance.

8.22 Core Working Group workshop: “Modelling the Clean Industrial Deal,” 4 December 2024



The workshop focused on the infrastructure investments needed to enable a clean economy, with a particular emphasis on decarbonising the steel sector. Workshop outcomes will guide our use of Integrated Assessment Models (IAMs) to provide actionable policy insights.

The workshop brought together policymakers, civil society, and industry representatives to collaborate on policy-driven modelling. Their contributions will help shape our research outcomes, which centre on two key modelling studies co-developed with policymakers:

1. Updated NECPs and Cost-Optimal Pathways: How do the updated NECPs compare to a cost-optimal path for reaching EU climate targets, considering grid infrastructure, offshore development, cross-border connections, and generation-transmission cost balance? The study is led by **NTUA**.
2. Decarbonising the Steel Industry: How do policies shape the pathway to a decarbonised European steel industry, affecting energy demand, CO₂ emissions, and the industry's geographic shifts within the EU and globally? The study is led by **WI**.

At the start of the workshop, a brief introduction of IAM COMPACT as well as the aims of the workshop were discussed by Bruegel. Then, study leads briefly presented the background and approach of both studies, before splitting into two break-out rooms.

Room 1: EU Industry

Topics for discussion:

- Scenario design & technical implementation
- Policy instruments for supporting green steel

Which policy instruments for supporting green steel are most relevant in your opinion?
What are crucial aspects of their design?

CCBAM+GREEN: This scenario builds on the CBAM scenario but the EU aims to accelerate the transformation to green steel production by providing financial support to low-carbon primary steel production.

CBAM_green
scenario; how is
financial support
modelled? [-> see
below]

CERAM+GREEN

- Identical to CERAM but in addition the EU covers some part of fixed costs of steel production of location primary steel depending on amount of emission reduction and time-to-live ratio

opex support of transitioning of such factories.

Sanitation issues (particularly in low-income areas) disproportionately more than food safety

lead market creation (green steel definition, labeling)

eed for a
clear
mandate to
electrify

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Q1: What indicators are of most interest to you to illustrate the expected impacts of a decarbonised EU electricity system?



Q2: How can modelling better reflect the role of power system transformation as a key factor of EU competitiveness and resilience (e.g., metrics)?



Q3: What are critical uncertainties in achieving NECP/FF55 and net zero targets that should be addressed in our discussion/policy prescriptions?



Key takeaways:

Indicators

- Economic: energy prices, system costs, upfront investment needs, carbon budget (annual / overall)
- Environmental: air quality
- Electricity / grids: electricity/energy bills for households, temporal electricity price volatility, network tariffs, natural gas availability and origin, breakdown of costs for transmission and storage
- Social: benefits of electricity system decarbonisation & integration, % of prosumers, energy poverty rates through electricity prices & household consumption levels

Modelling of competitiveness / resilience

- Competitiveness: share of fossil fuels VS clean energy in total electricity bills; comparing costs by sector, regional disaggregation of energy prices over time; share of RES production & residual load
- Resilience: net imports of energy

Uncertainties

- Policy/regulation: NECPs are politically driven scenarios; frequent changes of electricity market design
- Market dynamics: sector coupling to fully capture the potential of flexibility & cost optimality, development of ancillary services for power market size
- Tech deployment: electrification rate (what if demand stays flat), lack of flexibility in the energy system
- External factors: deteriorating international relationships, trade disruptions and access to clean tech, assumed commodity prices (hydrogen, FF) accounting for climate change (e.g., change of cooling demand).

8.23 Core Working Group workshop: "Citizens in the transition," 5 December 2024



The workshop focused on lifestyle changes in mobility, diets, and housing, household decarbonisation, and distributional impacts of climate policies. Workshop outcomes will guide our use of Integrated Assessment Models (IAMs) to provide actionable policy insights.

The workshop brought together policymakers, civil society, and industry representatives to collaborate on policy-driven modelling. Your contributions will help shape our research outcomes, which centre on three key modelling studies co-developed with policymakers:

1. Study 11: How can redistribution mechanisms be utilised to balance the economic impacts across various income groups while supporting fair and equitable decarbonisation outcomes? The study is led by BC3.
2. Study 13: What are the emission and costs of new energy usage profiles by households, and especially widespread efficient usage of heat pumps and electric vehicles charging? The study is led by UPRC.
3. Study 14: What are the emissions and cost implications of lifestyle changes in transport, buildings and food sectors? What is the role of lifestyle changes on the EU's pathway towards net-zero? The study is led by UVA.

At the start of the workshop, a brief introduction of IAM COMPACT as well as the aims of the workshop were discussed by Bruegel. Then, study leads briefly presented the background and approach of both studies, before splitting into three break-out rooms.

Room 1: Distributional Impacts

Topics for discussion:

- Scenario design
- Distributional impacts focus

• Redistribution options

Topic 1: Scenarios to explore and/or compare (GCAM)

What do you think about the next possible Scenarios?

- A comparison between the base year (2015) and a future year (e.g., 2030) in one scenario (e.g., Fit-for-55 policy scenario)?
- A comparison of a future year (e.g., 2030) between a policy (e.g., Fit-for-55 policy scenario) and a counterfactual/no-policy scenario?
- Other specific policy scenarios?

Topic 2: Analysis and focus of distributional impacts (MEDUSA)

Which groups do you find most relevant to analyze?

- Vertical distributional implications (Income Groups)?
- Horizontal analysis (Socioeconomic Characteristics)?
 - Gender
 - Rural vs Urban
 - Type of Households
 - Origin
- Energy and Transport poverty?

Topic 3: Redistribution options (WILLIAM)

What do you think about the following redistribution options?

- Increase social benefits
- Reduce income tax
- Basic income
- Repay debt

Key takeaways:

- decomposing Fit-for-55 (EPBD, vehicle standards) considering impact across different groups
- counterfactual delay of implementation of ETS II
- indirect impact of carbon price
- considering digitalisation (e.g., lack of internet for smart metering)
- green public goods

Room 2: Household decarbonisation

Topics for discussion:

- National level: barriers hindering adoption; alignment of policies with household preferences & financial capabilities
- EU-level: key options for residential decarbonisation; Fit-for-55 impacts
- Global level: most important policies for household decarbonisation towards climate neutrality

Household decarbonisation at the national level

- What are the **key parameters** to consider for the effective implementation of each **level of ambition pathway**?
 - What **barriers** might hinder the adoption of **medium** and **high-level measures**, and how can these barriers be addressed?
 - How effective are **current policies** and incentives in promoting **high-level interventions**?
 - How well do the proposed intervention pathways align with **household preferences** and **financial capabilities**?
 - What role do **socioeconomic factors** play in the feasibility and adoption of **high-level interventions**?
-

Household decarbonisation at the EU level

- What are the **most important options** to transform the EU's residential sector in the context of **climate neutrality**?
 - What is the role and impacts of specific **"Fit for 55" measures and transition options**?
 - How effective are the **EU policy instruments** to reduce emissions from households?
 - Which **contextual factors** at the EU level are most relevant for household decarbonisation?
-

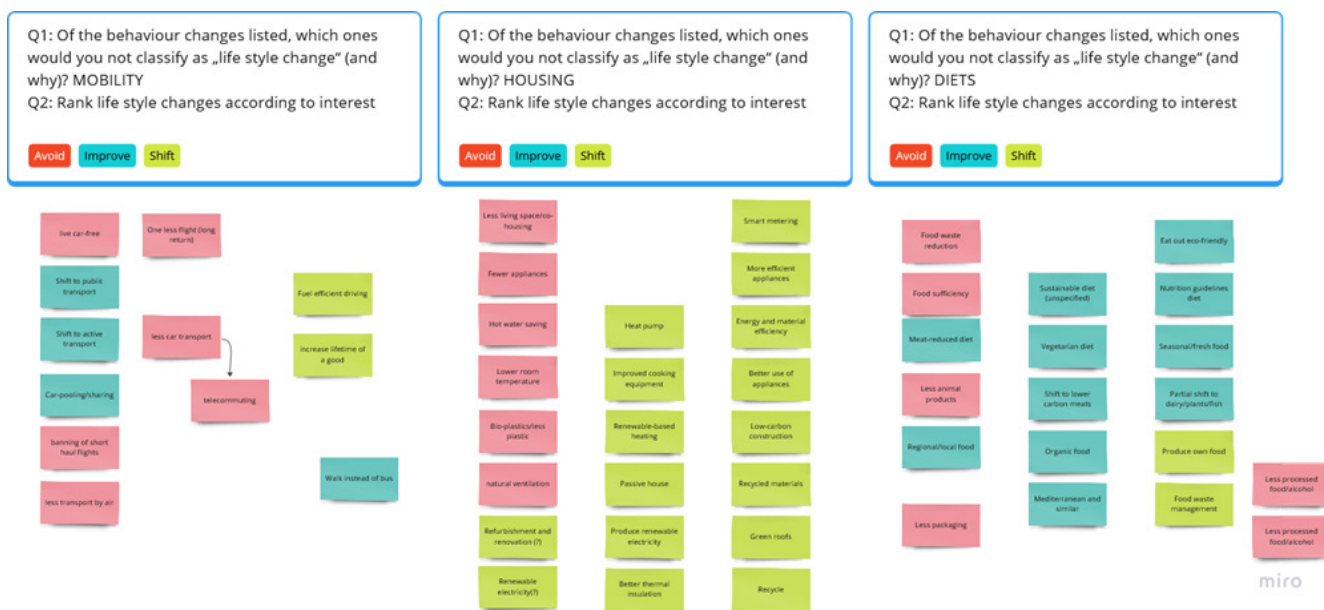
Household decarbonisation at the global level

- What are the **most important options** to transform the global residential sector in the context of **climate neutrality**?
 - How effective are the **global policy instruments** to reduce emissions households?
 - Which **contextual factors** at the global level are most relevant for household decarbonisation?
-

Room 3: Lifestyle changes

Topics for discussion:

- ranking lifestyle changes according to interest



Key takeaways on Studies 13 & 14:

- Importance of understanding the effects of new energy consumption patterns on the broader energy system. For example, role of Interest on system cost and emissions.
- Two-part tariffs to incentivise flexible consumption while protecting consumers. Modelling of flexible vs. inelastic consumption in households.
- Importance of framing the modelling results in the context of the target. Realism (or lack of it) should be recognised in any policy document
- Improve the representation of the socioeconomic dimension and cost of implementing measures. For example, through subsidies for renovating housing or walking in transport.
- Stakeholders suggested implementing different degrees of lifestyle change in modelling to account for such realism.
- Stakeholders expressed an interest in refining the modelling from a demographic (different ages and income group) and regional perspective.
- Different energy profiles of households, again by demographic and region.
- The realism of the results should be explicitly stated, as well as whether it is incumbent upon the individual (i-frame) or on society (s-frame) to drive the changes.

8.24 Grantham Institute Climate Research Showcase 2025, 22 January 2025



Join the Grantham Institute's inaugural Climate Research Showcase on Wednesday, 22 January 2025, where Imperial's research community will come together to exchange ideas, foster collaboration and support effective action on climate change.

From an all-day exhibition and peer-led workshops to seminars and a Special Lecture, the Climate Research Showcase is a space for dialogue and discovery. Participants will have the opportunity to profile their work, engage with renowned climate scientists and connect with the Imperial climate research community through activities designed to spark curiosity and collaboration.

By fostering connections and discussions around pressing environmental challenges, the Climate Research Showcase underscores the Grantham Institute's commitment to multidisciplinary solutions.

Our colleague Alaa Al Khourdajie (Imperial) will present the IAM COMPACT-related work: Navigating the unexpected: The impact of disruptive events on mitigation scenarios. Our analysis highlights the inherent limitations of IAMs in capturing the full complexity of disruptive events. We are currently exploring methodological approaches to overcome these limitations, within existing IAMs frameworks.

You may register [here](#).

GCAM Modeling of European decarbonisation and EU policy strategies, 17 June 2025



GCAM Global User Committee Webinar Series

GCAM Modeling of European decarbonisation and EU policy strategies

Presenter: Dirk-Jan Van de Ven & Clàudia Rodés Bachs (BC3)
Moderator: Yang Ou (Peking Univ.)
Zoom Meeting ID: 847 6642 7308
Passcode: 500542
Date: Jun 17, 2025
Time: 2PM CET (Bilbao) / 8AM EDT (Wash. DC) / 8PM CST (Beijing) / 17:30PM IST (Delhi)

The GCAM Global User Committee (GGUC) is an international network that brings together GCAM users to share insights, best practices, and regional perspectives.



The GCAM Global User Committee (GGUC) will host the monthly GGUC webinar by our colleagues Dr. Dirk-Jan Van de Ven & Clàudia Rodés Bachs from BC3, titled:

GCAM Modeling of European decarbonisation and EU policy strategies

Date: Tuesday June 17 2025

Time: 2PM CET (Bilbao) / 8AM EDT (Wash. DC) / 8PM CST (Beijing) / 17:30PM IST (Delhi)

Zoom: <https://lnkd.in/g6kCgceT>

Sign up for mailing list to join the GGUC mailing list for future events: <https://lnkd.in/eDY6-Jjr>

9 List of commentaries & other publications in the Press

In this section, all articles published¹¹ about the project and/or commentaries by partners in media/international press are presented.

9.1 Doukas & Oikonomou (2023), Euractiv

Title:	European industry has stood its ground but needs a new perspective
Authors:	Haris Doukas (NTUA), Vlasios Oikonomou
Medium:	Euractiv
Abstract:	European industries have been severely affected by the energy crisis and are at a disadvantage against global competitors. To face the upcoming years, they will need strong support at the European and national levels, write Haris Doukas and Vlasios Oikonomou.
Keywords:	Industry; perspective
Link:	https://www.euractiv.com/section/energy-environment/opinion/european-industry-has-stood-its-ground-but-needs-a-new-perspective/
First Online:	10 January 2023
Citation (APA):	Doukas, H., & Oikonomou, V. (2023). European industry has stood its ground but needs a new perspective. Euractiv. https://www.euractiv.com/section/energy-environment/opinion/european-industry-has-stood-its-ground-but-needs-a-new-perspective/ .

¹¹ <https://iam-compact.eu/communication/mediapress>

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European industry has stood its ground but needs a new perspective

DISCLAIMER: All opinions in this column reflect the views of the author(s), not of EURACTIV Media network.

By Haris Doukas and Vlasios Oikonomou Est. 6min 10 Jan 2023



Now is the time to prioritise clean energy investments and shift to low-emissions manufacturing processes. The current trend in all the large developed economies is the provision of diverse support to local industries to render them pioneers in the technologies, materials, and services required by the green transformation of the global economy. [Shutterstock / ArtVeil]

Recommended articles

- Romanian MEPs challenge Schengen blockade, point to new EU migration deal
- Berlin says EU should prepare for war by end of decade
- Europe's far-right wins big with Macron's migration bill
- Berlin says EU should prepare for war by end of decade
- Orbán is 'Trojan horse' for Russian interests, says Czech minister
- Brussels takes heat pump 'action plan' off the agenda
- The Brief — No country for old men

Figure 91. Preview of article 'European industry has stood its ground but needs a new perspective' in Euractiv

9.2 Doukas (2023), ESG Stories

Title:	Why do the oil and gas industries find the SDG market attractive? (in Greek)
Authors:	Haris Doukas (NTUA)
Medium:	ESG Stories
Abstract:	The realism of long-term national climate pledges is strictly evaluated on the basis of finding plausible and feasible roadmaps towards these targets—why shouldn't the same principle apply for corporate pledges? The emerging ESG market can set monitoring protocols and processes for missed targets, so that transparency and reliability can be ensured, writes Prof. Haris Doukas (in Greek).
Keywords:	ESG; targets
Link:	https://www.esgstories.gr/opinions/giati-i-biomihania-petrelaiou-kai-fysikoy-aerioy-theorei-elkystiki-tin-agora-esg
First Online:	11 January 2023
Citation (APA):	Doukas, H. (2023). Why do the oil and gas industries find the SDG market attractive?. ESG Stories. https://www.esgstories.gr/opinions/giati-i-biomihania-petrelaiou-kai-fysikoy-aerioy-theorei-elkystiki-tin-agora-esg (in Greek).



Figure 92. Preview of article ' Why do the oil and gas industries find the SDG market attractive?' in ESG Stories

9.3 Fraser-Baxter (2023), Imperial College London News

Title:	Climate disaster with 2°C of warming could be avoided if global pledges are met
Authors:	Sam Ezra Fraser-Baxter
Medium:	Imperial College London News
Abstract:	Sam Ezra Fraser-Baxter writes in the Imperial College London blog about the findings of our study in Nature Climate Change, van de Ven et al., 2023.
Keywords:	Nature Climate Change; study
Link:	https://www.imperial.ac.uk/news/244971/climate-disaster-with-2c-warming-could/
First Online:	18 May 2023
Citation (APA):	Fraser-Baxter, S.E. (2023). Climate disaster with 2°C of warming could be avoided if global pledges are met. Imperial College London News. https://www.imperial.ac.uk/news/244971/climate-disaster-with-2c-warming-could/ .



Figure 93. Preview of article ' Climate disaster with 2°C of warming could be avoided if global pledges are met ' in Imperial College London News

9.4 Hirji (2023), Bloomberg

Title:	Climate Pledges Reach Threshold to Keep Warming Below 2C
Authors:	Zahra Hirji
Medium:	Bloomberg
Abstract:	"The main takeaway of this research is definitely positive," said Dirk-Jan van de Ven, the lead author on the report and a postdoctoral researcher at BC3 in Spain. "If all governments indeed follow the promises actually made, then we are actually keeping temperatures well below 2°C."
Keywords:	Nature Climate Change; study
Link:	https://www.bloomberg.com/news/articles/2023-05-18/climate-pledges-reach-threshold-to-keep-warming-below-2c
First Online:	18 May 2023
Citation (APA):	Hirji, Z. (2023). Climate Pledges Reach Threshold to Keep Warming Below 2C. Bloomberg. https://www.bloomberg.com/news/articles/2023-05-18/climate-pledges-reach-threshold-to-keep-warming-below-2c .



Figure 94. Preview of article ' Climate Pledges Reach Threshold to Keep Warming Below 2C ' in Bloomberg

9.5 Pianta & Brutschin (2023), Nature Climate Change

Title:	Increased ambition is needed after Glasgow
Authors:	Silvia Pianta, Elina Brutschin
Medium:	Nature Climate Change
Abstract:	At COP26 in Glasgow, major emitters significantly ratcheted up their climate commitments. Such increased ambition will substantially contribute to getting closer to the long-term goal of the Paris Agreement but more ambition is required, and mitigation might face different challenges in different regions. Silvia Pianta & Elina Brutschin discuss the findings of van de Ven, DJ., Mittal, S., Gambhir, A. et al. A multimodel analysis of post-Glasgow climate targets and feasibility challenges. <i>Nat. Clim. Chang.</i> (2023). https://doi.org/10.1038/s41558-023-01661-0
Keywords:	COP26; multimodel
Link:	https://www.nature.com/articles/s41558-023-01676-7
First Online:	18 May 2023
Citation (APA):	Pianta, S., & Brutschin, E. (2023). Increased ambition is needed after Glasgow. <i>Nature Climate Change</i> , 1-2.

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News & Views | [Published: 18 May 2023](#)

Climate action

Increased ambition is needed after Glasgow

[Silvia Pianta](#)  & [Elina Brutschin](#) 

[Nature Climate Change](#) **13**, 505–506 (2023) | [Cite this article](#)

369 Accesses | 16 Altmetric | [Metrics](#)

At COP26 in Glasgow, major emitters significantly ratcheted up their climate commitments. Such increased ambition will substantially contribute to getting closer to the long-term goal of the Paris Agreement but more ambition is required, and mitigation might face different challenges in different regions.

The latest assessment report of the IPCC highlights that current climate mitigation policies are not sufficient to reach the long-term goal of the Paris Agreement³. Integrated assessment models (IAMs) have been essential to assess the impact of different climate mitigation commitments and NDCs^{4,5,6,7,8,9}. An ongoing discussion has emerged around the feasibility

Figure 95. Preview of article 'Increased ambition is needed after Glasgow' in Nature Climate Change

9.6 Doukas (2023), Kathimerini

Title:	New study sheds light on the progress of climate action
Authors:	Haris Doukas (NTUA)
Medium:	Kathimerini
Abstract:	What have we achieved in the 7+ years after the Paris Agreement was adopted? Project Coordinator, Prof. Haris Doukas, reports on the findings of our study, van de Ven et al., 2023, in Nature Climate Change.
Keywords:	Nature Clumage change; study
Link:	https://www.kathimerini.gr/life/environment/562441741/nea-meleti-richnei-fos-stin-exelixa-tis-klimatikis-krisis/
First Online:	26 May 2023
Citation (APA):	Doukas, H. (2023). New study sheds light on the progress of climate action, Kathimerini. https://www.kathimerini.gr/life/environment/562441741/nea-meleti-richnei-fos-stin-exelixa-tis-klimatikis-krisis/ (<i>in Greek</i>).



Figure 96. Preview of article 'New study sheds light on the progress of climate action ' in Kathimerini

9.7 Van de Ven et al. (2023), The Conversation

Title:	Current emissions targets could keep the planet below a 2°C temperature rise but a turbocharged effort is needed
Authors:	Dirk-Jan van de Ven (BC3), Ajay Gambhir (Imperial), Alexandros Nikas (NTUA), Shivika Mittal (Imperial)
Medium:	The Conversation
Abstract:	Evidently, ever since the COP26 Glasgow process, the most relevant factor to avoid a climate disaster is to secure the implementation of the existing country pledges.
Keywords:	COP26; country pledges
Link:	https://theconversation.com/current-emissions-targets-could-keep-the-planet-below-a-2-c-temperature-rise-but-a-turbocharged-effort-is-needed-206434
First Online:	7 June 2023
Citation (APA):	Van de Ven, D.J., Gambhir, A., Nikas, A. & Mittal, S. (2023). Current emissions targets could keep the planet below a 2°C temperature rise but a turbocharged effort is needed. The Conversation. https://theconversation.com/current-emissions-targets-could-keep-the-planet-below-a-2-c-temperature-rise-but-a-turbocharged-effort-is-needed-206434 .

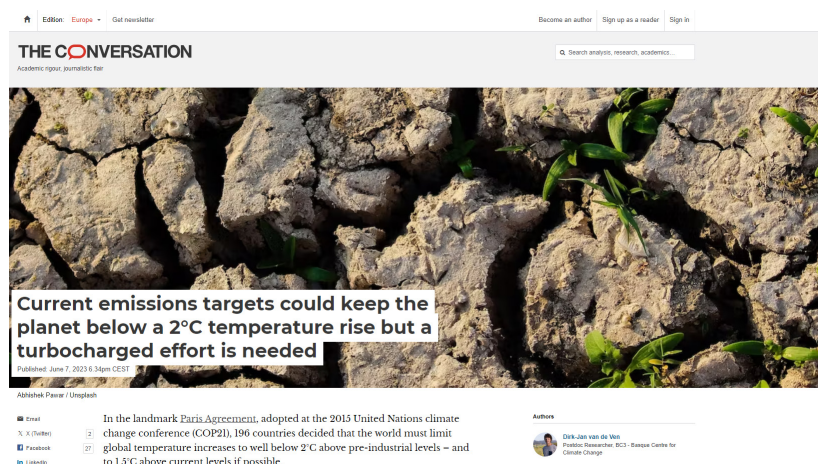


Figure 97. Preview of article 'Current emissions targets could keep the planet below a 2°C temperature rise but a turbocharged effort is needed ' in The Conversation

9.8 ESI Africa (2023), ESI Africa

Title:	Kenya: Climate modelling workshop to focus on key energy issues
Authors:	ESI Africa
Medium:	ESI Africa
Abstract:	A research project aiming to support the assessment of global climate goals, among others, is hosting a four-day modelling workshop in Mombasa, Kenya. Under the auspices of Horizon Europe, the EU's key funding programme for research and innovation, the IAM COMPACT project is travelling to developing countries.
Keywords:	Africa; climate change; East Africa; energy efficiency
Link:	https://www.esi-africa.com/news/kenya-climate-modelling-workshop-to-focus-on-key-energy-issues/
First Online:	28 August 2023
Citation (APA):	ESI Africa (2023). Kenya: Climate modelling workshop to focus on key energy issues. ESI Africa. https://www.esi-africa.com/news/kenya-climate-modelling-workshop-to-focus-on-key-energy-issues/ .



Figure 98. Preview of article 'Kenya: Climate modelling workshop to focus on key energy issues' in ESI Africa

9.9 Tsipouridis & Elmawi (2023), The Star

Title:	TSIPOURIDIS & ELMAWI: Year of many firsts leaves humanity gasping for breath of fresh air
Authors:	Ioannis Tsipouridis (TUM), Omar Elmawi
Medium:	The Star
Abstract:	As we proceed to the second day of the Africa Climate Summit, it is crucial to highlight the severity of the climate crisis we face. Dr. Ioannis Tsipouridis, director of Renewable Energy and Climate Change Research Centre, Technical University of Mombasa, Kenya and Mr. Omar Elwani, lawyer and executive director at Muslims for Human Rights, were featured in The Star, a daily newspaper published in Nairobi, Kenya. In summary, they note that: Science has been monotonously repeating report after report and COP after COP that we should phase out fossil fuels to reduce CO₂ emissions. Unfortunately, the response is woefully inadequate, when not outright in the opposite direction.
Keywords:	Africa Climate Summit; CO ₂ emissions
Link:	https://www.the-star.co.ke/opinion/columnists/2023-09-05-tsipouridis--elmawi-year-of-many-firsts-leaves-humanity-gasping-for-breath-of-fresh-air/
First Online:	5 September 2023
Citation (APA):	Tsipouridis, I. & Elmawi, O. (2023). TSIPOURIDIS & ELMAWI: Year of many firsts leaves humanity gasping for breath of fresh air. The Star. https://www.the-star.co.ke/opinion/columnists/2023-09-05-tsipouridis--elmawi-year-of-many-firsts-leaves-humanity-gasping-for-breath-of-fresh-air/

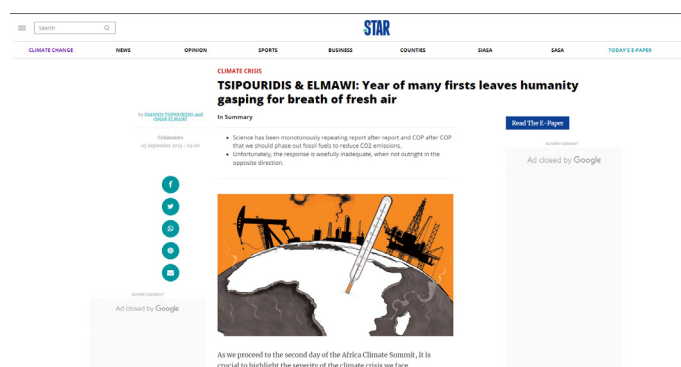


Figure 99. Preview of article 'TSIPOURIDIS & ELMAWI: Year of many firsts leaves humanity gasping for breath of fresh air' in The Star

9.10 Africa.com (2023), Africa.com

Title:	IAM COMPACT A Horizon Europe Modelling Workshop In Mombasa
Authors:	Africa.com
Medium:	Africa.com
Abstract:	A research project aiming to support the assessment of global climate goals, among others, is hosting a four-day modelling workshop in Mombasa, Kenya. Under the auspices of Horizon Europe, the EU's key funding programme for research and innovation, the IAM COMPACT project is travelling to developing countries.
Keywords:	Africa; climate change; East Africa; energy efficiency
Link:	https://www.africa.com/iam-compact-a-horizon-europe-modelling-workshop-in-mombasa/
First Online:	9 September 2023
Citation (APA):	Africa.com (2023). IAM COMPACT A Horizon Europe Modelling Workshop In Mombasa. Africa.com. https://www.africa.com/iam-compact-a-horizon-europe-modelling-workshop-in-mombasa/ .

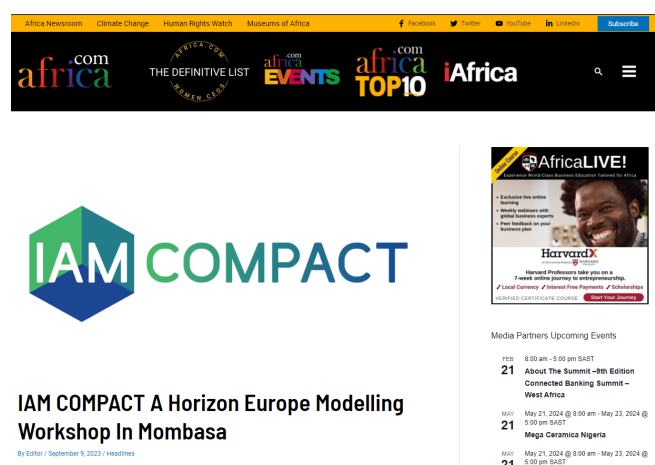


Figure 100. Preview of article 'IAM COMPACT A Horizon Europe Modelling Workshop In Mombasa ' in Africa.com

9.11 Al Khourdajie et al. (2023), The Conversation

- Title:** The COP28 climate agreement is a step backwards on fossil fuels
- Authors:** Alaa Al Khourdajie (Imperial), Chris Bataille, Lars J Nilsson
- Medium:** The Conversation
- Abstract:** The COP28 climate summit in Dubai has adjourned. The result is “The UAE consensus” on fossil fuels.
Alaa Al Khourdajie, Chris Bataille and Lars J Nilsson explain how COP28 missed the chance to set a firm, scientifically-backed benchmark for future fossil fuel use.
- Keywords:** COP28; fossil fuels
- Link:** <https://theconversation.com/the-cop28-climate-agreement-is-a-step-backwards-on-fossil-fuels-219753>
- First Online:** 13 December 2023
- Citation (APA):** Al Khourdajie, A., Bataille, C. & Nilsson, L.J. (2023). The COP28 climate agreement is a step backwards on fossil fuels. The Conversation. <https://theconversation.com/the-cop28-climate-agreement-is-a-step-backwards-on-fossil-fuels-219753>



Figure 101. Preview of article 'The COP28 climate agreement is a step backwards on fossil fuels' in The Conversation

9.12 Peters GP and Meinshausen M (2024), Frontiers for young minds

- Title:** We Are Not on Track: Greenhouse Gas Emissions Are Higher Than Ever!
- Authors:** Glen P. Peters, Malte Meinshausen
- Medium:** Frontiers for young minds
- Abstract:** Glen Peters and Malte Meinshausen explain how past energy use and emissions have led to a changing climate, and emphasise the need for urgent mitigation technologies, measures and policies to avoid the worst of climate change.
- Keywords:**
- Link:** <https://kids.frontiersin.org/articles/10.3389/frym.2024.1343809/full#ref4>
- First Online:** 18 June 2024
- Citation (APA):** Peters GP and Meinshausen M (2024) We Are Not on Track: Greenhouse Gas Emissions Are Higher Than Ever!. Front. Young Minds. 12:1343809. doi: 10.3389/frym.2024.1343809

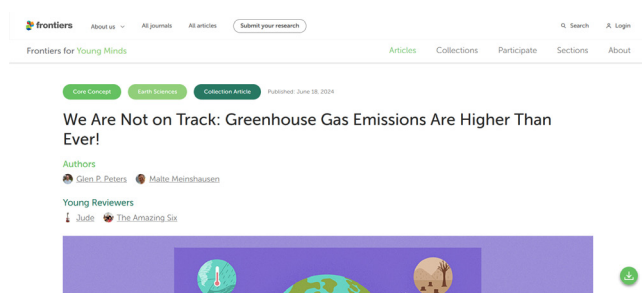


Figure 102. Preview of article 'We Are Not on Track: Greenhouse Gas Emissions Are Higher Than Ever!' in Frontiers for young minds

9.13 Shivika Mittal et al. (2025), CICERO

Title:	How has climate policy and technology affected the transformation toward a low-emission future?
Authors:	Shivika Mittal, Glen Peters, Ida Sognnæs
Medium:	CICERO
Abstract:	While emissions have grown and climate targets become more ambitious over the last decade, the investments needed to limit global warming to below 1.5-2°C have not increased, thanks to faster-than-expected reduction in costs of clean technologies such as solar, wind and battery storage. This analysis was published in Nature Climate Change.
Keywords:	Emission scenarios; International climate policy; IPCC Sixth Assessment Report; Renewable energy
Link:	https://www.cicero.oslo.no/en/articles/how-has-climate-policy-and-technology-affected-the-transformation-toward-a-low-emission-future
First Online:	21 January 2025
Citation (APA):	

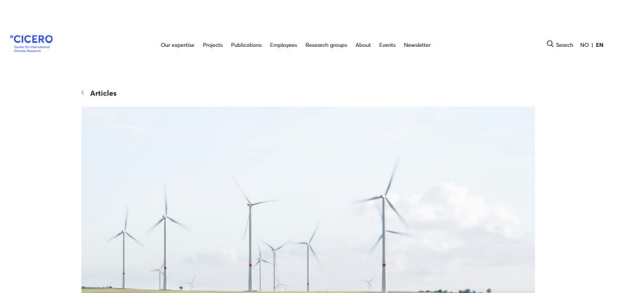


Figure 103. Preview of article 'How has climate policy and technology affected the transformation toward a low-emission future?' in CICERO

9.14 Teferi et al. (2025), CORDIS - EU research results

Title:	Collaborative modelling for new climate commitments
Authors:	Solomon Tesfamariam Teferi (Addis Ababa University), Fitsum S. KEBEDE, PhD (Addis Ababa University), Camilla Lo Giudice (KTH Royal Institute of Technology), Chamindie Senaratne (KTH Royal Institute of Technology), Francesco Gardumi (KTH Royal Institute of Technology), Ioannis Tsipouridis (Dr) (Technical University of Mombasa), Conall Heussaff (Bruegel - Improving economic policy), Natasha Frilingou (DSS Lab, EPU-NTUA), Alexandros Nikas (DSS Lab, EPU-NTUA)
Medium:	CORDIS - EU research results
Abstract:	IAM COMPACT is featured in the Africa-EU collaboration CORDIS - EU research results: "Global research centres, including universities in Kenya and Ethiopia, collaborate with stakeholders in four partner countries to co-create integrated assessment models that address relevant climate and sustainability concerns."
Keywords:	IAM COMPACT; NDCs; Policy Response Mechanism; IAMs; integrated assessment models; Paris Agreement; nationally determined contributions
Link:	https://cordis.europa.eu/article/id/458235-collaborative-modelling-for-new-climate-commitments
First Online:	16 May 2025
Citation (APA):	

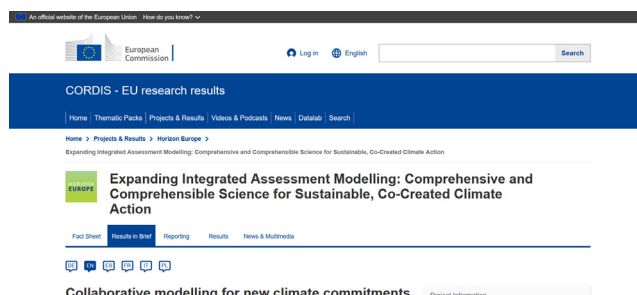


Figure 104. Preview of article 'Collaborative modelling for new climate commitments' in CORDIS - EU research results

10 List of videos

As of January 2024, 21 videos have been uploaded in the project's website and YouTube channel¹², aiming to familiarise stakeholders with the project's modelling ensemble and/or promote capacity development.

10.1 Calliope model presentation

Title: Calliope model presentation

Description: Calliope is a well-known framework to build energy system models, designed by Stefan Pfenninger and Bryn Pickering, and it is used to analyse systems with arbitrarily high spatial and temporal resolution, with a scale-agnostic mathematical formulation permitting analyses ranging from single urban districts to countries and continents. Calliope's key features include the ability to handle high spatial and temporal resolution and to easily run on high-performance computing systems.

Link: <https://www.youtube.com/watch?v=TDTZK-jJIJ0>

Online: 10 February 2023



Figure 105. Preview of the video 'Calliope model presentation'

¹² <https://www.youtube.com/@iam-compact>

10.2 AIM-Enduse model presentation

Title: AIM-Enduse model presentation

Description: The AIM/End-use Indian model integrates the water and energy module at the resource and technological level into the existing energy and environment systems to capture the impacts of existing and future policies for water, energy, and land systems on the major water- and energy-intensive sectors. The model uses recursive dynamics and runs in annual time steps. It optimizes costs (technology, energy, and water) and resources (water, energy) by selecting a set of best available technologies based on given physical resources and technological and environmental parameters. A detailed characterization of the inputs reflects an optimistic engineering view of technological progress. Economic parameters, such as taxes, subsidies, resource (energy, water, and land) technologies, policies, and social costs are also classified. The final service demand is exogenous and is driven not only by the gross domestic product (GDP) but also by end-use consumption and policies across various sub-sectors. The model is also being soft-linked to climatic–hydrological models.

Link: <https://www.youtube.com/watch?v=Thb5YB2T9yE&t=1s>

Online: 10 February 2023



Figure 106. Preview of the video 'AIM-Enduse model presentation'

10.3 CHANCE model presentation

Title: CHANCE model presentation

Description: CHANCE is a macro-micro model based on a computable general equilibrium (CGE) model that includes a large amount of household microdata. It is a disaggregated multiregional and multisector model that included information for around 200,000 households covering all EU regions, ensuring a large representation of the behaviour of the European households. Therefore, CHANCE is a model designed to analyse the socioeconomic and distributional impacts of public policies that directly affect households and consumers, both economic, energy, environmental or fiscal. The CGE of CHANCE is built on a latest version of the GTAP database (GTAP 10), while the main source of microdata is the latest harmonized European HBS, which is merged with SILC through statistical matching.

Link: <https://www.youtube.com/watch?v=WUjLiaOFuCM>

Online: 10 February 2023

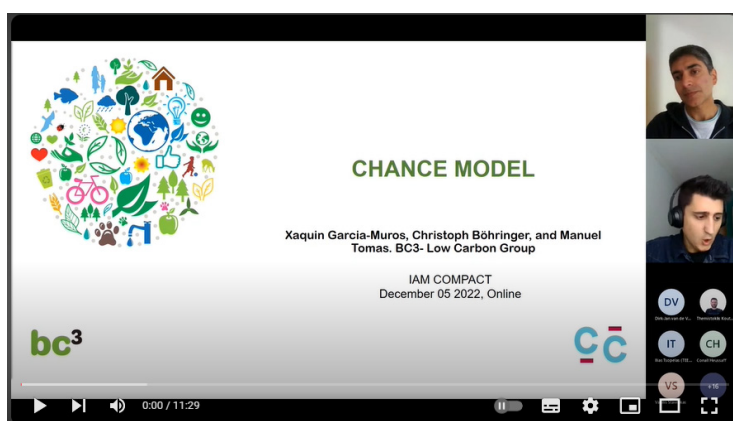


Figure 107. Preview of the video 'CHANCE model presentation'

10.4 China MORE model presentation

Title: China MORE model presentation

Description: China-MORE is a bottom-up long-term multi-sector multi-GHG emission reduction evaluation model based on the VEDA-TIMES model platform for energy system optimization. The China-MORE model adopts the principle of system analysis and takes the energy system optimization module as the core. It combines the modules of energy service demand, multi-greenhouse gas emission, air pollutants emission, power technology diffusion, emission space allocation and uncertainty analysis.

The core modules of the model are energy system optimization module and greenhouse gas emission module. Firstly, the energy service demand module provides the service demand of industry, construction, transportation, agriculture, waste treatment and other sectors according to the social and economic development factors. The model energy system optimization module can obtain the fuel combination and technology composition with minimum cost according to the given demand level. At the same time, pollutant emission module and GHG (CO₂ excluded) emission module output emission data of different scenarios. On this basis, the model can estimate the medium - and long-term optimal emission path accordingly.

Link: <https://www.youtube.com/watch?v=KosD0CoYZ-Q>

Online: 10 February 2023



Figure 108. Preview of the video 'China MORE model presentation'

10.5 CLEWs modelling framework presentation

Title: CLEWs modelling framework presentation

Description: The Climate, Land, Energy, Water systems (CLEWs) methodology is a model-based methodology to assess costs and benefits of policy and investment decisions made in one sector (e.g., land use) on the other sectors (e.g., water supply) and thereby support policy coherence. CLEWs models can be developed with different approaches and different modelling tools, such as OSeMOSYS, MESSAGE, LEAP, WEAP and GAEZ. Often, a CLEWs model consists of a techno-economic representation of the climate, land, energy, and water systems within the long-term optimisation tool OSeMOSYS. Here, the parts of these systems are represented as processes with certain transfer functions and exchanging between them different commodities. For example, one particular agricultural land use is represented as a 'box' that takes a certain quantity of water, energy and land area as inputs and delivers part of the water (through ground water recharge or surface run off) and a crop with a certain yield. The optimisation seeks to minimise the Net Present Value of all costs incurred across the water, energy and land sectors in the whole-time domain analysed (typically, of several decades), while meeting an increasing demand for commodities (e.g., food products) and resource availability constraints.

Link: <https://www.youtube.com/watch?v=XHnkfHEbjmM>

Online: 10 February 2023



Figure 109. Preview of the video 'CLEWs modelling framework presentation'

10.6 EXPANSE model presentation

Title: EXPANSE model presentation

Description: EXPANSE is a modelling framework that is composed of two separate European models: 1) spatially explicit EXPANSE for NUTS-2 and NUTS-3 analysis of electricity system capacity investment and operation as well as associated regional impacts (e.g., employment, land use). 2) D-EXPANSE is a retrospective electricity system transition model.

Link: <https://www.youtube.com/watch?v=HAwSO3EAeqs>

Online: 10 February 2023



Figure 110. Preview of the video 'EXPANSE model presentation'

10.7 MEDEAS / WILIAM models presentation

Title: MEDEAS / WILIAM models presentation

Description: MEDEAS

MEDEAS is a set of policy-simulation dynamic-recursive models sharing the same conceptual modelling approach which have been designed applying system dynamics. Models at three different geographical aggregated scales have been developed: global (MEDEAS-W), European Union (MEDEAS-EU) and country-level for Austria and Bulgaria (MEDEAS-AUT and MEDEAS-BGR, respectively). MEDEAS models are structured in nine main modules: economy, energy demand, energy availability, energy infrastructures and EROI, minerals, land-use, water, climate/emissions, and social and environmental impact indicators. The biophysical limits associated with the exploitation of natural resources (energy and materials), the dynamic EROI and the feedbacks between the modules play an essential role in the model.

WILIAM

The WILIAM ("Within limits") Integrated Assessment Model (IAM), developed in the scope of LOCOMOTION project, is a model running at three geographical levels – global, European and national for the 27 EU member states and United Kingdom (UK); integrating full models of water, land-use and society (including the endogenization of population); develop the economy module towards a comprehensive representation of production, consumption, government, international trade, finance and climate change impacts and include the full supply of materials. All the models run from 2015 to 2050-2100. WILIAM model is built on the existing MEDEAS model that was developed in the context of the EU-funded MEDEAS project. For the study of the highly complex interactions between humans and their environment, the project draws on different techniques and methods, such as System Dynamics (SD) modelling with Vensim software, Input-Output Analysis (IOA), Energy Return On Investment (EROI) calculations, Life Cycle Analysis (LCA), land and carbon footprinting, microsimulation, and many others.

Link: <https://www.youtube.com/watch?v=Tmjvdjm2koU>

Online: 17 February 2023

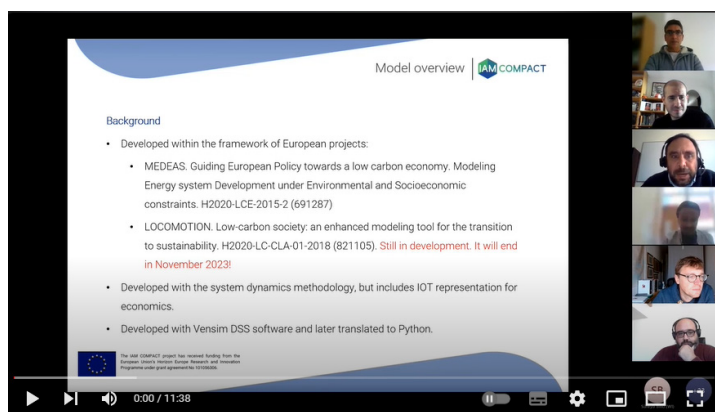


Figure 111. Preview of the video 'MEDEAS / WILIAM models presentation'

10.8 TIAM model presentation

Title: TIAM model presentation

Description: The TIMES Integrate Assessment Model, TIAM, is the multi-region, which combines an energy system representation of fifteen different regions with options to mitigate non-CO₂ greenhouse gases as well as non-energy CO₂ mitigation options. It uses emissions from these sources to calculate temperature changes using a simple climate module. As such, it can be used to explore a variety of questions on how to mitigate climate change through energy system and transformations, as well as reductions in non-energy CO₂ emissions and non-CO₂ emissions.

Link: <https://www.youtube.com/watch?v=SP0XDoACVKM>

Online: 17 February 2023



Figure 112. Preview of the video 'TIAM model presentation'

10.9 DREEM model presentation

Title: DREEM model presentation

Description: The Dynamic high-Resolution dEmand-side Management (DREEM) model is a fully integrated simulation model resolving key features that are not found together in existing Demand-Side Management (DSM) models.

The model serves as an entry point in DSM modelling in the building sector, by expanding the computational capabilities of existing Building Energy System (BES) models to simulate transition scenarios in the building sector from the demand side, e.g., calculating energy demand profiles, assessing the benefits and limitations of energy efficiency and demand-flexibility primarily for consumers and then for other power actors involved, etc.

DREEM is a hybrid bottom-up model that combines the key features of both statistical and engineering models. The novelty of the DREEM model lies mainly in its modularity, as its structure is decomposed into individual modules characterised by the main principles of component- and modular-based system modelling approach, namely "the interdependence" of decisions within modules.

Link: <https://www.youtube.com/watch?v=p0ziPbTsmqc>

Online: 10 February 2023



Figure 113. Preview of the video 'DREEM model presentation'

10.10 DyNERIO model presentation

Title: DyNERIO model presentation

Description: DynERIO is an integrated energy-economy modelling framework. Based on input-output databases capturing the whole economic spectrum and multiple regions, it allows to model policies in terms of: (i) increase in consumption of goods; (ii) change of industries' productive structure (i.e., steel plants switch from coal/gas to electricity use). New production levels of energy commodities, needed to fulfil the shocked economic system, are tracked by the input-output table and converted into capacity to be operative at a given year. From the information of the capacity stock evolution over time it is possible to derive the associated net extraction of raw materials.

Link: <https://www.youtube.com/watch?v=XPc9weC41tk>

Online: 10 February 2023



Figure 114. Preview of the video 'DyNERIO model presentation'

10.11 EnergyPLAN model presentation

Title: EnergyPLAN model presentation

Description: EnergyPLAN is an energy system analysis tool created for designing and studying future sustainable energy systems with an emphasis on systems with a high penetration of renewable energy sources. EnergyPLAN simulates the operation of national and regional systems on an hourly basis, including the electricity, heating, cooling, industry, and transport sectors. The tool is a deterministic input/output model and allows for modelling of all thermal, renewable, storage, conversion, and transport technologies. General model inputs are energy demands, renewable energy sources, energy technology capacities, costs (investment, operation, and fuel), and user-defined operation strategies.

Link: https://www.youtube.com/watch?v=BUgUI1iv_4Y

Online: 10 February 2023

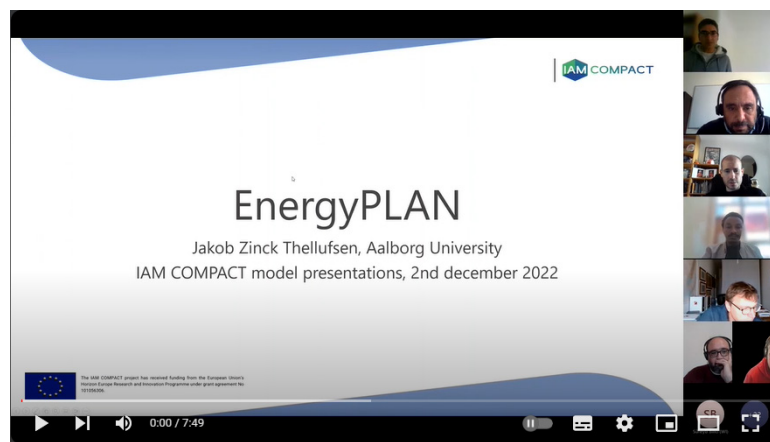


Figure 115. Preview of the video 'EnergyPLAN model presentation'

10.12 GCAM model presentation

Title: GCAM model presentation

Description: The Global Change Analysis Model (GCAM) is a multisector integrated assessment model aimed at analysing human and Earth system dynamics, by exploring the interdependencies between the economy, energy, water, climate, and AFOLU systems within a single computational platform. The model is designed to analyse alternative "what-if" type scenarios and assess potential impacts of different assumptions about future conditions. The model reads in exogenous scenario "assumptions" about key drivers (e.g., population, economic growth, technology/land costs...) and then assesses the implications of these assumptions on key scientific or decision-relevant outcomes (e.g., prices, energy use, land use, water use, emissions, and concentrations). See GCAM documentation for more details: <https://github.com/JGCRI/gcam-doc/blob...>

Link: https://www.youtube.com/watch?v=hG-cs_V5q1s

Online: 10 February 2023



Figure 116. Preview of the video 'GCAM model presentation'

10.13 GCAM-USA model presentation

Title: GCAM-USA model presentation

Description: GCAM is an open-source, global, long-term, multi-sector human Earth system model; it contains representations of energy, economy, agriculture and land-use, and water systems for 32 geopolitical regions in the globe. GCAM-USA divides the United States into 50 states and the District of Columbia. GCAM-USA is embedded within the global GCAM model, so conditions within the United States are internally consistent with international conditions. The state-level regions contain more detailed representations of national-level economic features, including socioeconomics, energy transformation, carbon storage, renewable resources, electricity markets, and consumer end-use energy demands.

Link: <https://www.youtube.com/watch?v=Bp3lzu5uPKo>

Online: 17 February 2023



Figure 117. Preview of the video 'GCAM-USA model presentation'

10.14 IMACLIM China model presentation

Title: IMACLIM China model presentation

Description: IMACLIM-China is a single region recursive dynamic computable general equilibrium model in China. The model is constructed based on IMACLIM-S framework developed by Centre International de Recherche sur l'Environnement et le Développement (CIRED). IMACLIM-China aims to study the medium- and long-term effects of energy and climate policies on China's macro economy through the equilibrium framework of physical quantity, price quantity and value quantity. The main feature of IMACLIM-CHN model is to ensure the technical authenticity of the model's simulation of energy systems and major innovations in energy systems by coupling the technical details of energy supply and energy consumption in the bottom-up model.

Link: <https://www.youtube.com/watch?v=bIm1APBAOhM>

Online: 17 February 2023



Figure 118. Preview of the video 'IMACLIM China model presentation'

10.15 MENA EDS model presentation

Title: MENA EDS model presentation

Description: The MENA-EDS model is a national-scale fully-fledged energy system model that covers in detail energy demand and supply and their complex interlinkages driven by energy prices. The model provides energy system projections until 2050, including energy consumption by sector, fuel mix, energy investment, and CO2 emissions, under different policy measures and technology assumptions. It addresses energy system analysis, energy price projections, power generation planning and climate change mitigation policies by sector for Middle East and North Africa (MENA) countries. MENA-EDS covers the main energy end-use sectors, including industries, transport and buildings, while the entire value chain of energy supply is represented through primary fuel extraction, energy transformation (power generation, refineries), and supply to final consumers.

Link: https://www.youtube.com/watch?v=cCNld_DUaug

Online: 17 February 2023



Figure 119. Preview of the video 'MENA EDS model presentation'

10.16 OSeMOSYS model presentation

Title: OSeMOSYS model presentation

Description: The Open Source energy MOdelling SYStem is a fully (data to solver) open source long-term bottom-up (technology rich) optimisation framework for energy systems modelling. It calculates for every year of a time domain the energy mix (in terms of capacity, capacity expansion and operation) that minimised the total Net Present Costs of the whole system while meeting exogenously defined demands for energy commodities or services and while complying with constraints dictated by resource availability, technical characteristics of technologies, policies. It is a partial equilibrium modelling tool. It can be used both with perfect or myopic foresight. It allows high temporal (up to hourly) and spatial resolution. It has been coupled with several other modelling tools. Its modelling paradigm is very close to MESSAGE's and quite similar to TIMES's. It is also the optimisation engine of LEAP (NEMO is a Julia translation of OSeMOSYS). Given its fully open-source nature, the availability of several interfaces with different degrees of technicality, the availability in three modelling languages (Python, GNU MathProg and GAMS) and the fast learning curve, it is largely used in capacity development and education activities.

Link: <https://www.youtube.com/watch?v=4Wj-qQPoLLU&t=1s>

Online: 17 February 2023



Figure 120. Preview of the video 'OSeMOSYS model presentation'

10.17 PROMETHEUS model presentation

Title: PROMETHEUS model presentation

Description: Prometheus model is a comprehensive energy demand and supply simulation tool designed to analyze global energy systems. It covers in detail future energy demand, supply, power generation mix, carbon emissions, energy prices and investments. The model incorporates demographic and economic indicators, primary and final energy consumption, fuel resources and prices, CO₂ emissions and technology dynamics (for power generation, road transport, hydrogen production and industrial and residential end-use technologies). PROMETHEUS incorporates a recursive dynamic (partial equilibrium energy system) model with annual resolution currently serviced to run up to the year 2050 (the process to extend model horizon to 2100 is ongoing). The model simulates both demand and supply of energy, interacting with each other to form market equilibrium at different regional scales (detailed regional balances are aggregated in order to simulate world energy markets). Its main objectives are: 1) Assess climate change mitigation pathways and low-emission development strategies for the medium and long-term 2) Analyse the energy system, economic and emission implications of a wide spectrum of energy and climate policy measures, differentiated by region and sector 3) Explore the economics of fossil fuel production and quantify the impacts of climate policies on the evolution of global energy prices.

Link: <https://www.youtube.com/watch?v=CJ2KznFYguo>

Online: 17 February 2023



Figure 121. Preview of the video 'PROMETHEUS model presentation'

10.18 MUSE model presentation

Title: MUSE model presentation

Description: The ModUlar energy system Simulation Environment (MUSE) is an agent-based framework, that explicitly simulates the decision-making process of firms and consumers in the energy system. MUSE is technology-rich, thereby it characterises the cost and performance of each technology option, tracks technology stock, and provides details on investment, operating costs, energy consumption, and emissions with a detailed bottom-up perspective.

MUSE-Global is an implementation of a global model in the MUSE framework, characterising 28-regions of the world, and running over a time horizon of 2010 to 2100. It can be used to explore a variety of questions on how to mitigate climate change given the presence of heterogeneous behaviours affecting the pace of the system change.

Link: https://www.youtube.com/watch?v=-hJRVm9G_JM

Online: 24 February 2023



Figure 122. Preview of the video 'MUSE model presentation'

10.19 WTMBT model presentation

Title: WTMBT model presentation

Description: The World Trade Model with Bilateral Trades (WTMBT) is a meso-economic linear optimization model based on the comparative advantage principle. Considering m world regions with n industries each, the WTMBT enables to endogenously determine the production yields and trades patterns required to satisfy an exogenously specified final demand yield in each region, minimizing the use of labour and capital by complying with regional factors endowments (e.g., availability of natural resources, land, workforce).

Link: <https://www.youtube.com/watch?v=7p4j8Ch04iE>

Online: 17 February 2023



Figure 123. Preview of the video 'WTMBT model presentation'

10.20 WISEE EDM Global Steel presentation

Title: WISEE EDM Global Steel model presentation

Description: The EDM Global-Steel model is used to analyse possible futures of the global steel sector (divided into 20 countries / regions including EU-27), including technological transformation pathways in each country/region, potential future trade of direct reduced iron (DRI) between countries / regions as well as (impacts of) demand levels and material efficiency. Main outputs of the model are final energy demand and GHG emissions per country/region as well as investment costs.

Link: <https://www.youtube.com/watch?v=Ceep4SrFXuc>

Online: 17 February 2023



Figure 124. Preview of the video 'WISEE EDM Global Steel model presentation'

10.21 WISEE EDM EU Industry presentation

Title: WISEE EDM EU Industry model presentation

Description: The EDM-Industry EU model system is used to analyse possible futures of an industrial production system and to derive technically consistent paths to it, starting from today's production system. For particularly energy-intensive and GHG-intensive sectors (steel, basic chemicals, refineries), aggregated values such as the CO₂ emissions of the European steel industry are derived from the properties and activity values of the individual plants included in the model and can be reported at the sub-national level. Other sectors of the basic industries are modelled on the basis of activities and technologies at the country level. The non-energy-intensive industries are modelled econometrically.

Link: <https://www.youtube.com/watch?v=PPQI8cRGWc>

Online: 17 February 2023



Figure 125. Preview of the video 'WISEE EDM EU Industry model presentation'

10.22 The IAM COMPACT vetting and validation tool: A step-by step video walkthrough

Title: The IAM COMPACT vetting and validation tool: A step-by step video walkthrough

Description: The IAM COMPACT validation and vetting tool is used for performing name-validation and region-mapping on the modelling results of Integrated Assessment Models (IAMs) thoughtout project, as well as vetting using the vetting criteria from IPCC AR6, and comparison with harmonisation data (e.g. population and GDP).

The app is available here <https://validation.iam-compact.eu/>

You may also run the app offline though its GitHub repo: <https://github.com/ciceroOslo/iamcompact-validation-ui>

Useful information:

- 1) The app is built in Python and Streamlit and will be eventually integrated in I2AM PARIS, an open-access, data exchange platform for modelling results (<https://i2am-paris.eu>).
- 2) It is based on a fork from the I2AM Paris validation app (<https://github.com/i2amparis/validation>).
- 3) Harmonisation data can be found in the IAM COMPACT deliverable "D4.4 – Broad Scenario Logic update" available on <https://zenodo.org/records/13132311>
- 4) Specification of the vetting criteria for IPCC AR6 vetting rules can be found in the IPCC AR6 Working Group III report, Annex III, Table 11.

Link: <https://www.youtube.com/watch?v=t3RLKMNGLz0>

Online: 25 October 2024

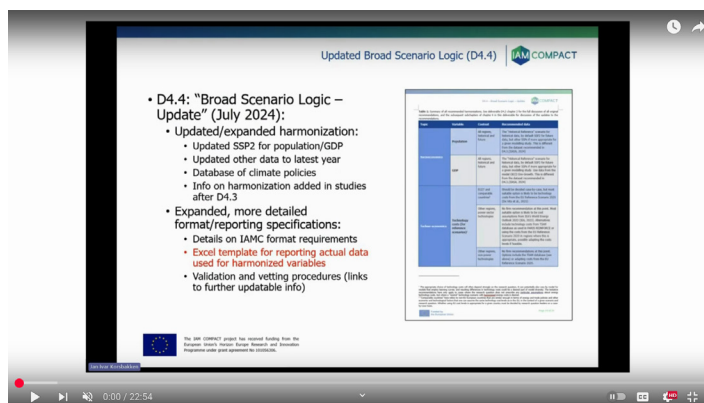


Figure 126. Preview of the video 'The IAM COMPACT vetting and validation tool: A step-by step video walkthrough'

11 List of infographics

In this section, all infographics published in the project website¹³ and social media are listed, for the time being focusing on statistical data on current/pressing energy issues and the UNFCCC Conference of the Parties.

11.1 December 2022: Biggest power source in the EU

This infographic demonstrates the biggest source of electricity in each of the 27 EU Member States.

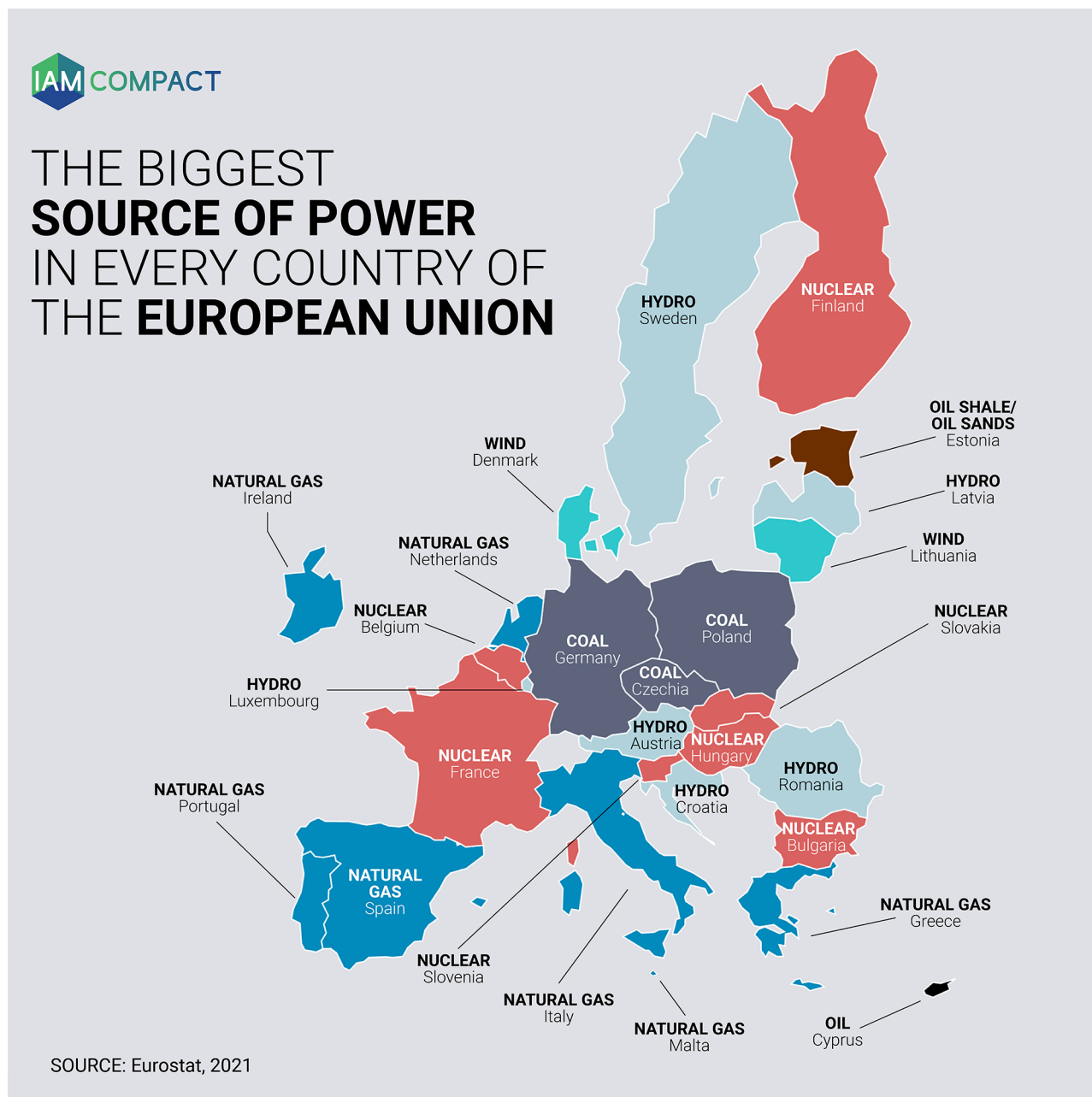


Figure 127. 'December 2022: Biggest power source in the EU' Infographic

¹³ <https://iam-compact.eu/communication/infographics>

11.2 January 2023: CO₂ emissions per capita in the EU

This infographic demonstrates the CO₂ emissions per capita (in metric tons) in a heatmap of the EU-27.

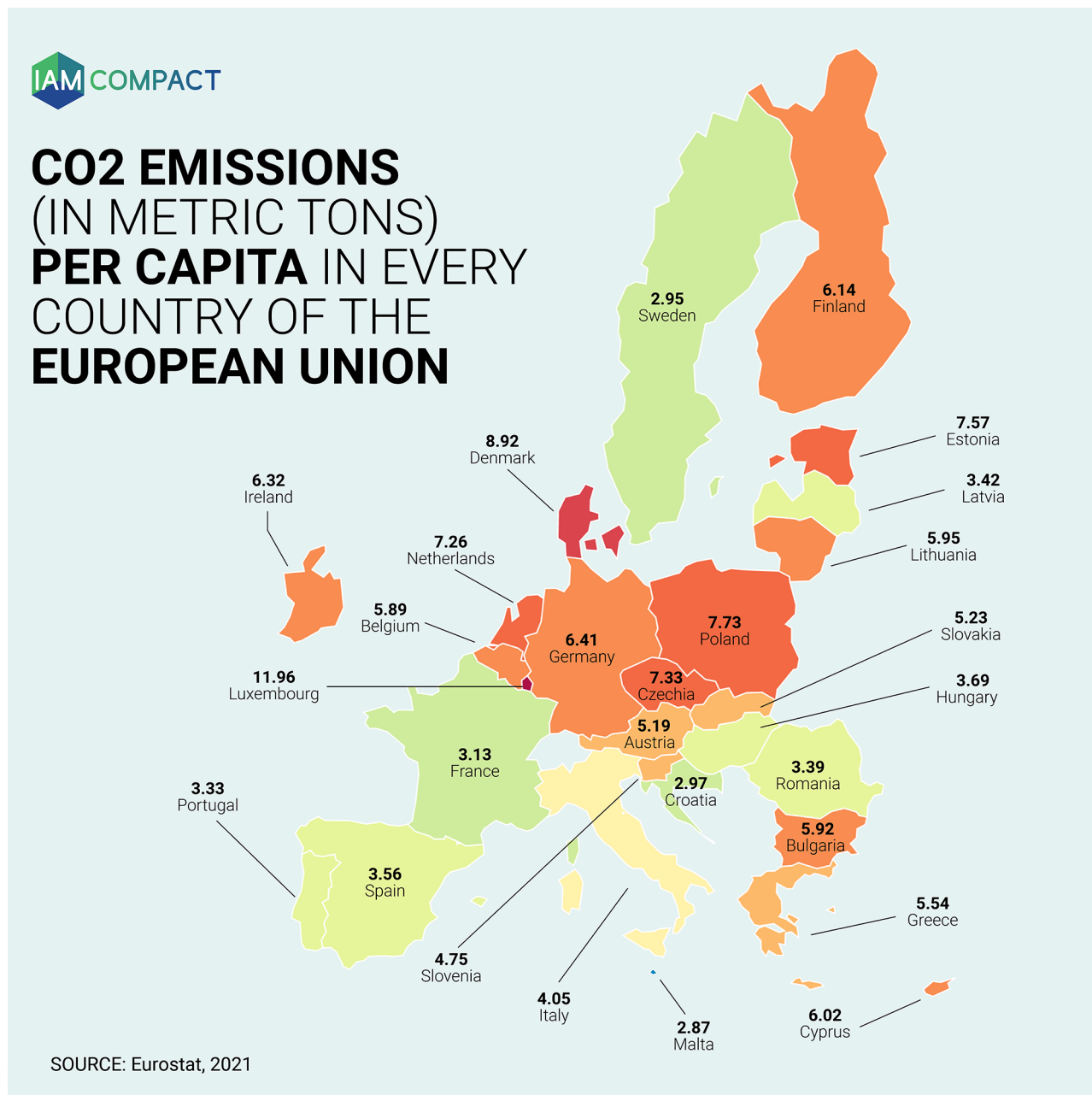


Figure 128. 'January 2023: CO₂ emissions per capita in the EU' Infographic

11.3 February 2023: Highest emitting sector in the EU

This infographic demonstrates the highest emitting sector in each of the 27 EU Member States.

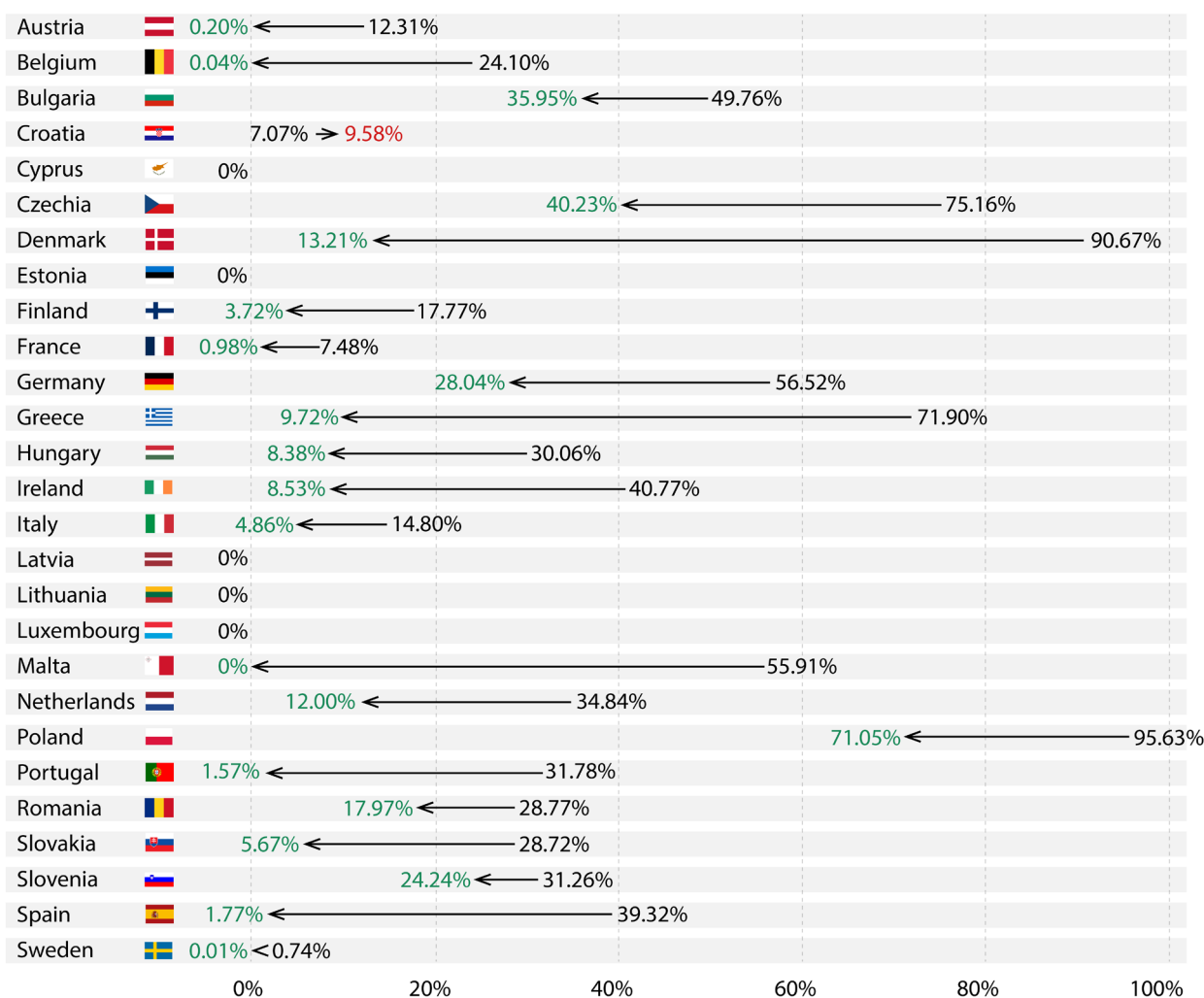


Figure 129. 'February 2023: Highest emitting sector in the EU' Infographic

11.4 March 2023: Evolution of coal in the EU

This infographic demonstrates the changes in coal share (since 1990) in each of the 27 EU Member States.

THE SHARE OF ELECTRICITY AND DERIVED HEAT THAT CAME FROM COAL IN 1990 (START OF ARROW) TO 2021 (END OF ARROW) IN EVERY COUNTRY OF THE EUROPEAN UNION.



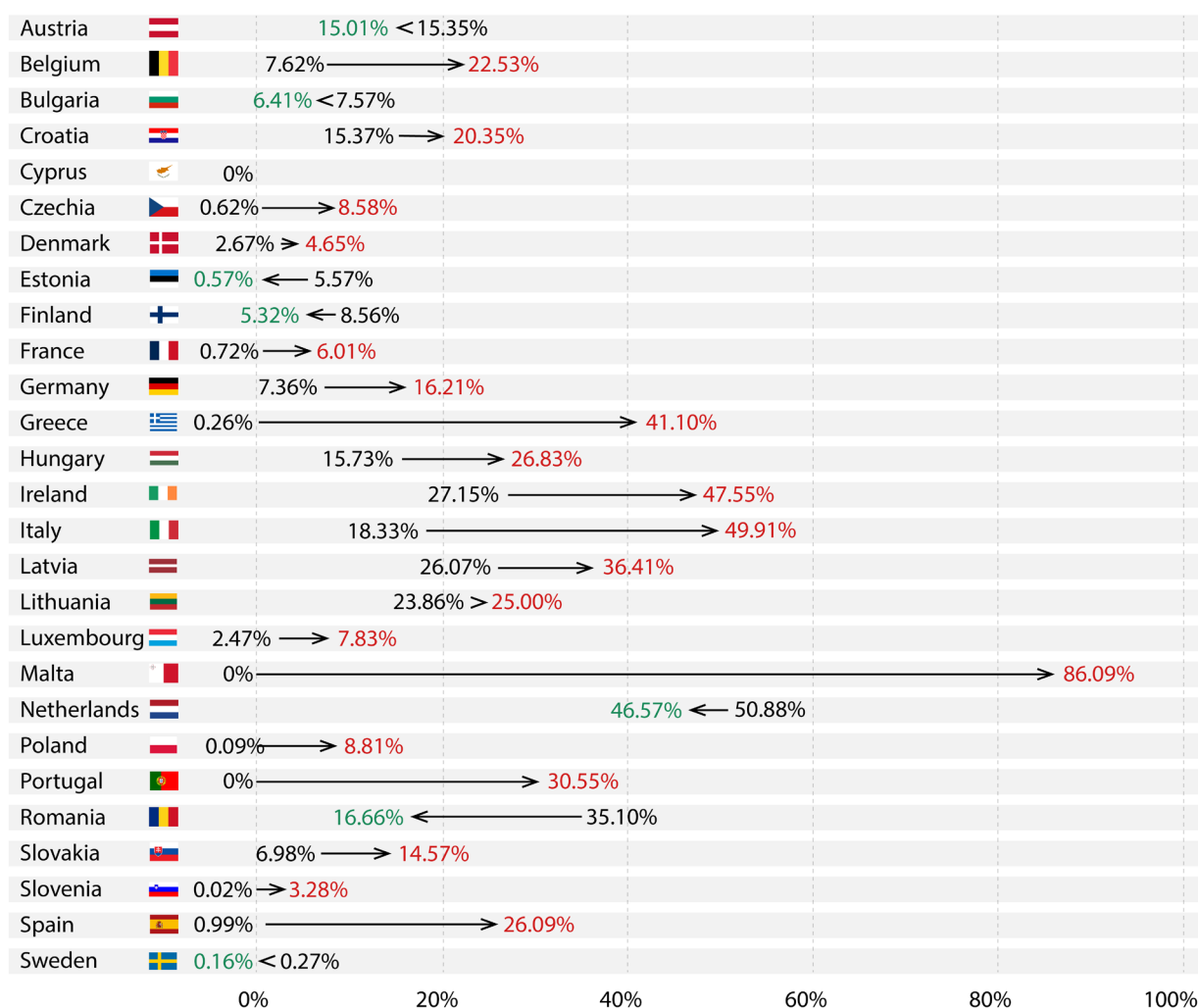
SOURCE: Eurostat, 2021

Figure 130. 'March 2023: Evolution of coal in the EU' Infographic

11.5 April 2023: Evolution of natural gas in the EU

This infographic demonstrates the changes in natural gas share (since 1990) in each of the 27 EU Member States.

THE SHARE OF ELECTRICITY AND DERIVED HEAT THAT CAME FROM NATURAL GAS IN 1990 (START OF ARROW) TO 2021 (END OF ARROW) IN EVERY COUNTRY OF THE EUROPEAN UNION.



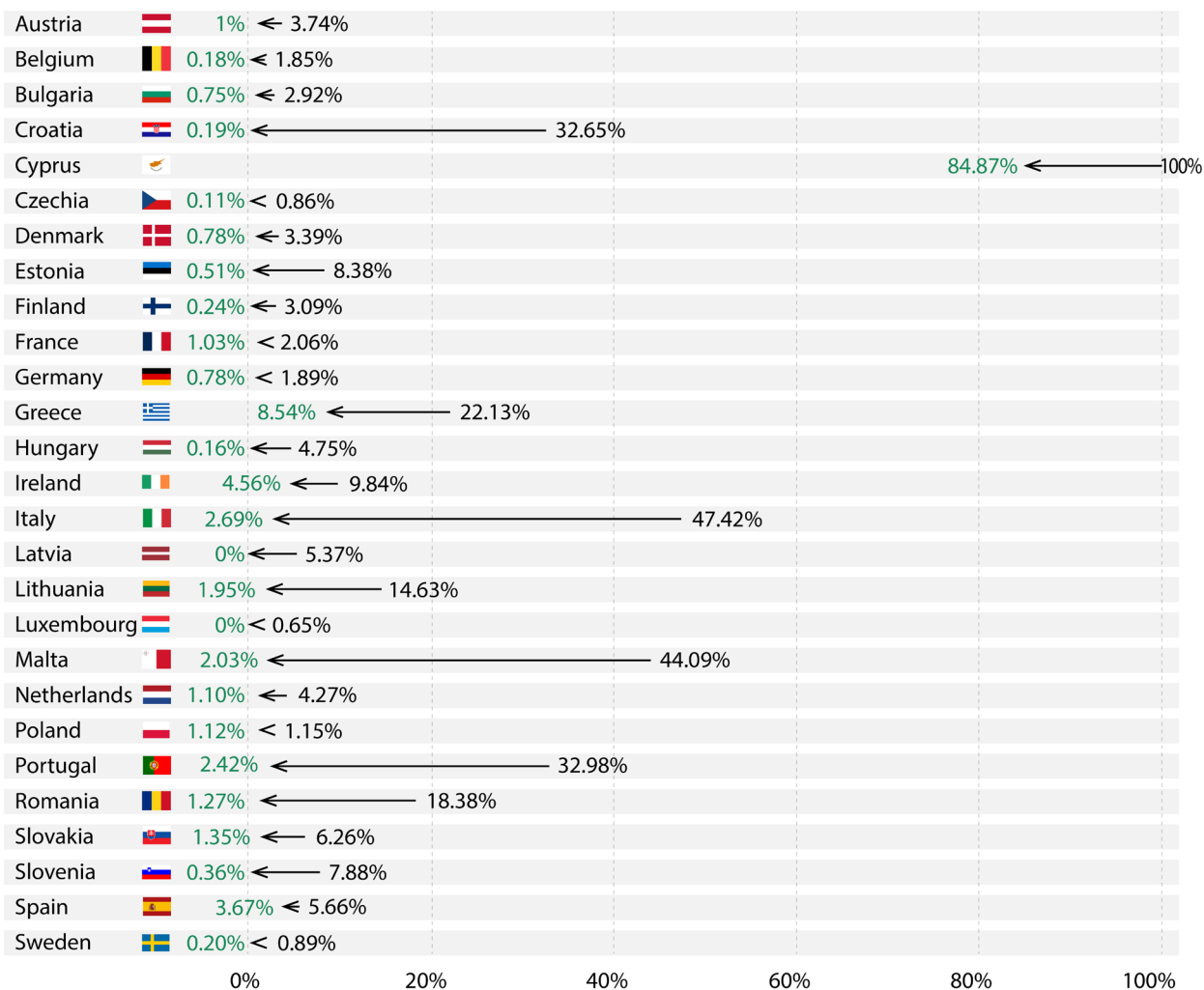
SOURCE: Eurostat, 2021

Figure 131. 'April 2023: Evolution of natural gas in the EU' Infographic

11.6 May 2023: Evolution of oil in the EU

This infographic demonstrates the changes in oil share (since 1990) in each of the 27 EU Member States.

THE SHARE OF ELECTRICITY AND DERIVED HEAT THAT CAME FROM OIL IN 1990 (START OF ARROW) TO 2021 (END OF ARROW) IN EVERY COUNTRY OF THE EUROPEAN UNION.



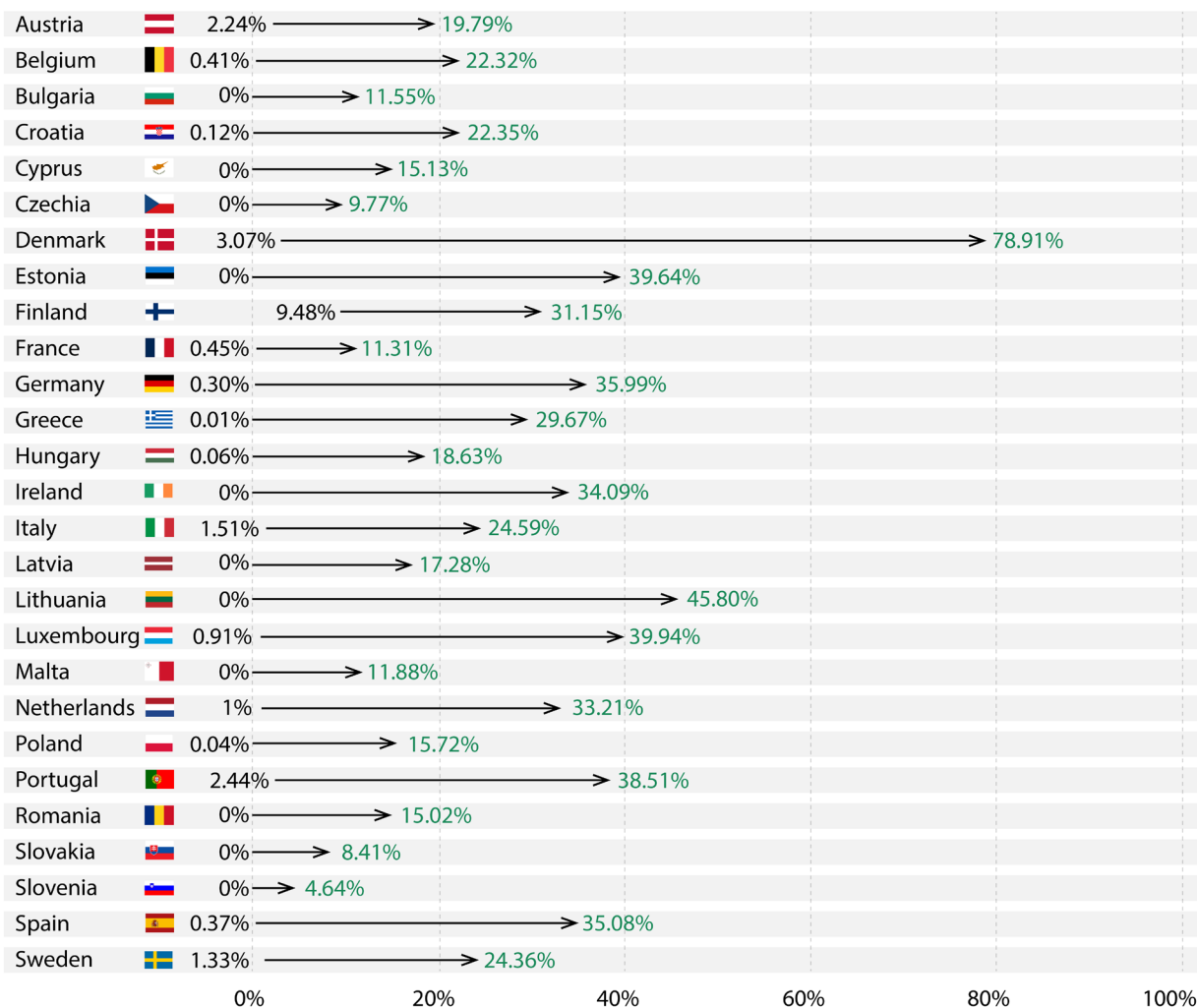
SOURCE: Eurostat, 2021

Figure 132. 'May 2023: Evolution of oil in the EU' Infographic

11.7 June 2023: Evolution of RES in the EU

This infographic demonstrates the changes in RES share (since 1990) in each of the 27 EU Member States.

THE SHARE OF ELECTRICITY AND DERIVED HEAT THAT CAME FROM RENEWABLES IN 1990 (START OF ARROW) TO 2021 (END OF ARROW) IN EVERY COUNTRY OF THE EUROPEAN UNION.



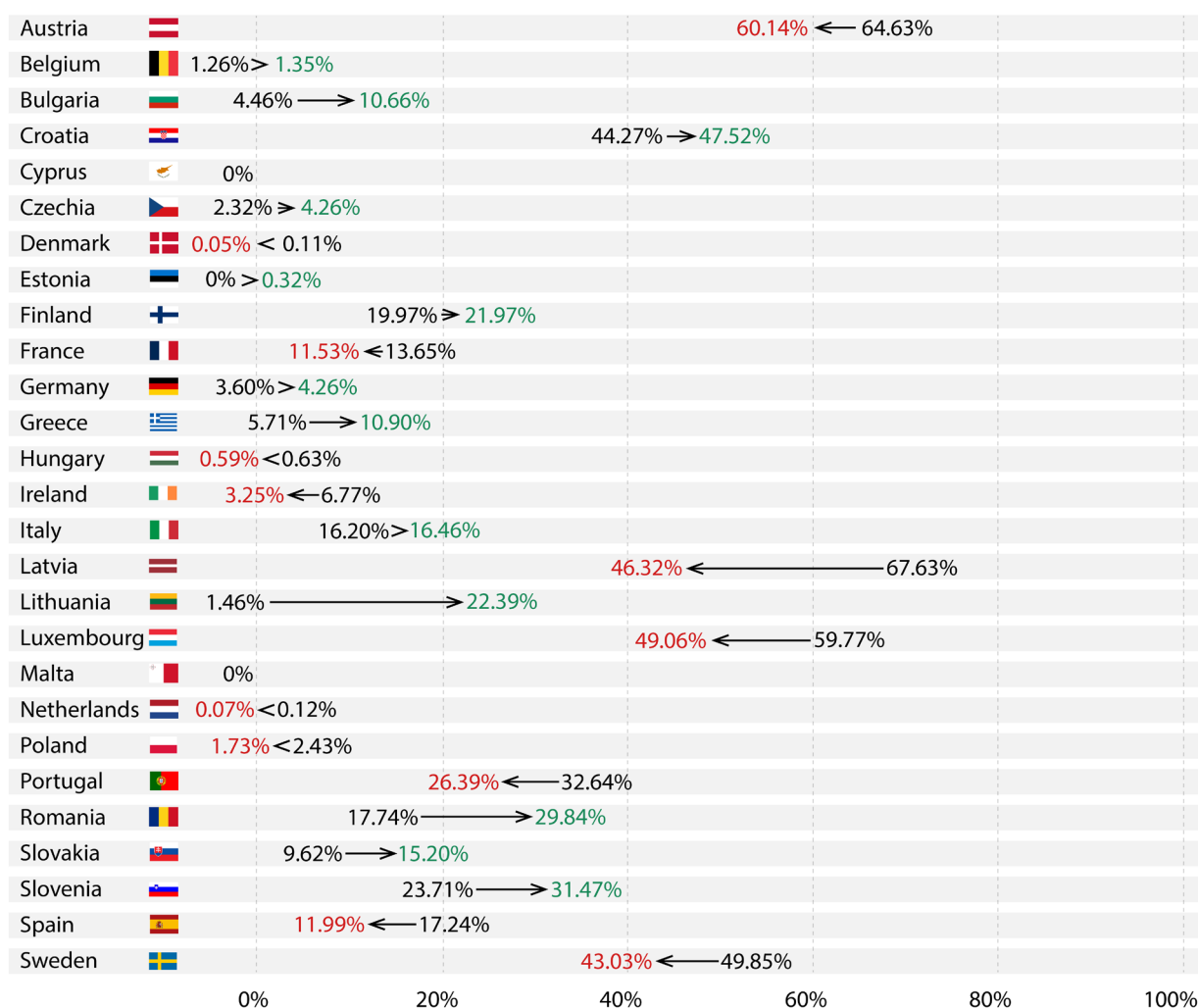
SOURCE: Eurostat, 2021

Figure 133. 'June 2023: Evolution of RES in the EU' Infographic

11.8 September 2023: Evolution of hydro in the EU

This infographic demonstrates the changes in hydropower share (since 1990) in each of the 27 EU Member States.

THE SHARE OF ELECTRICITY AND DERIVED HEAT THAT CAME FROM **HYDROELECTRIC POWER IN 1990 (START OF ARROW) TO 2021 (END OF ARROW) IN EVERY COUNTRY OF THE EUROPEAN UNION.**



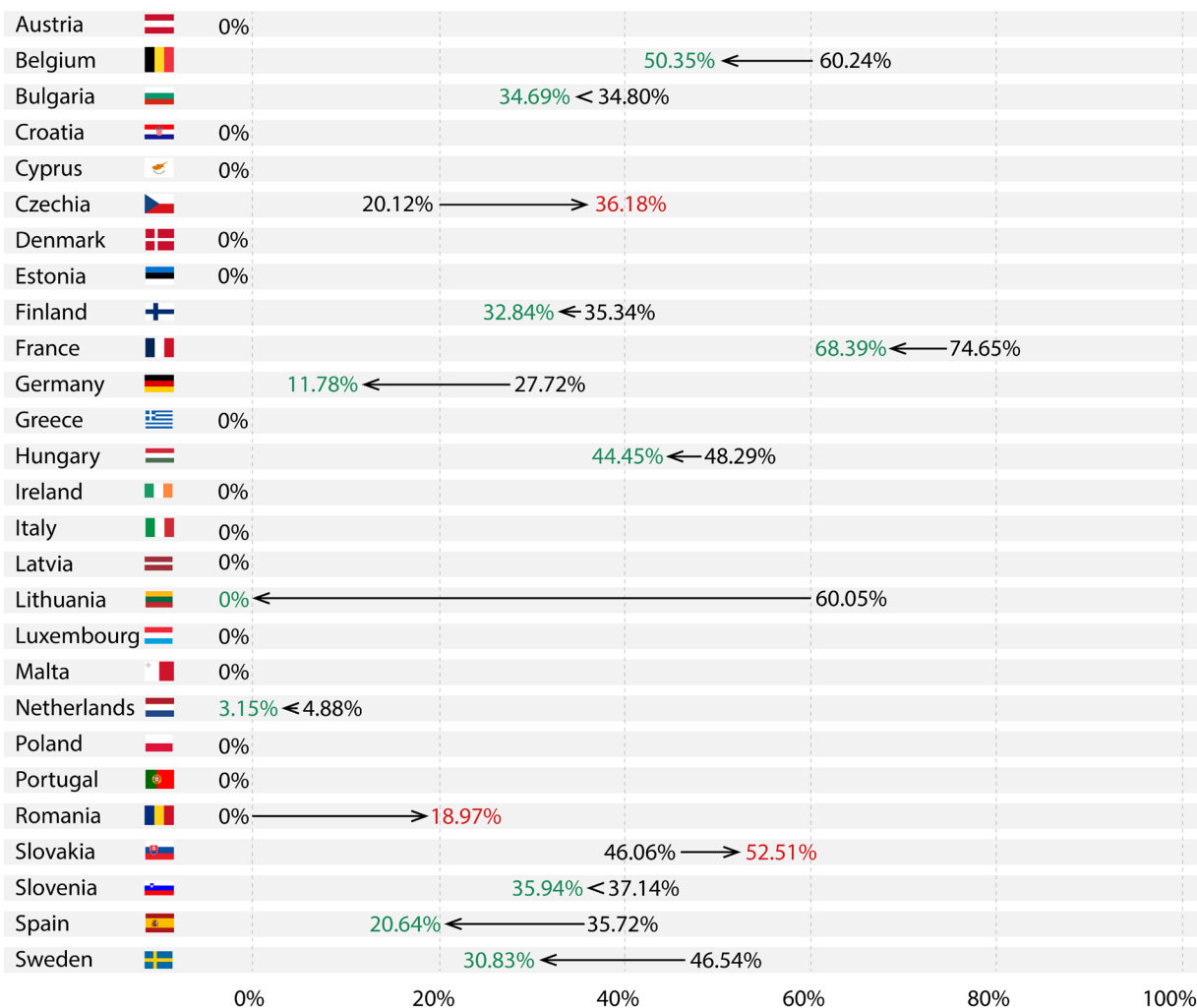
SOURCE: Eurostat, 2021

Figure 134. 'September 2023: Evolution of hydro in the EU' Infographic

11.9 October 2023: Evolution of nuclear in the EU

This infographic demonstrates the changes in nuclear power (since 1990) in each of the 27 EU Member States.

THE SHARE OF ELECTRICITY AND DERIVED HEAT THAT CAME FROM NUCLEAR POWER IN 1990 (START OF ARROW) TO 2021 (END OF ARROW) IN EVERY COUNTRY OF THE EUROPEAN UNION.



SOURCE: Eurostat, 2021

Figure 135. 'October 2023: Evolution of nuclear in the EU' Infographic

11.10 November 2023: A timeline of landmark COPs

This infographic demonstrates what to expect in COP28 and it is co-created with the DIAMOND project.

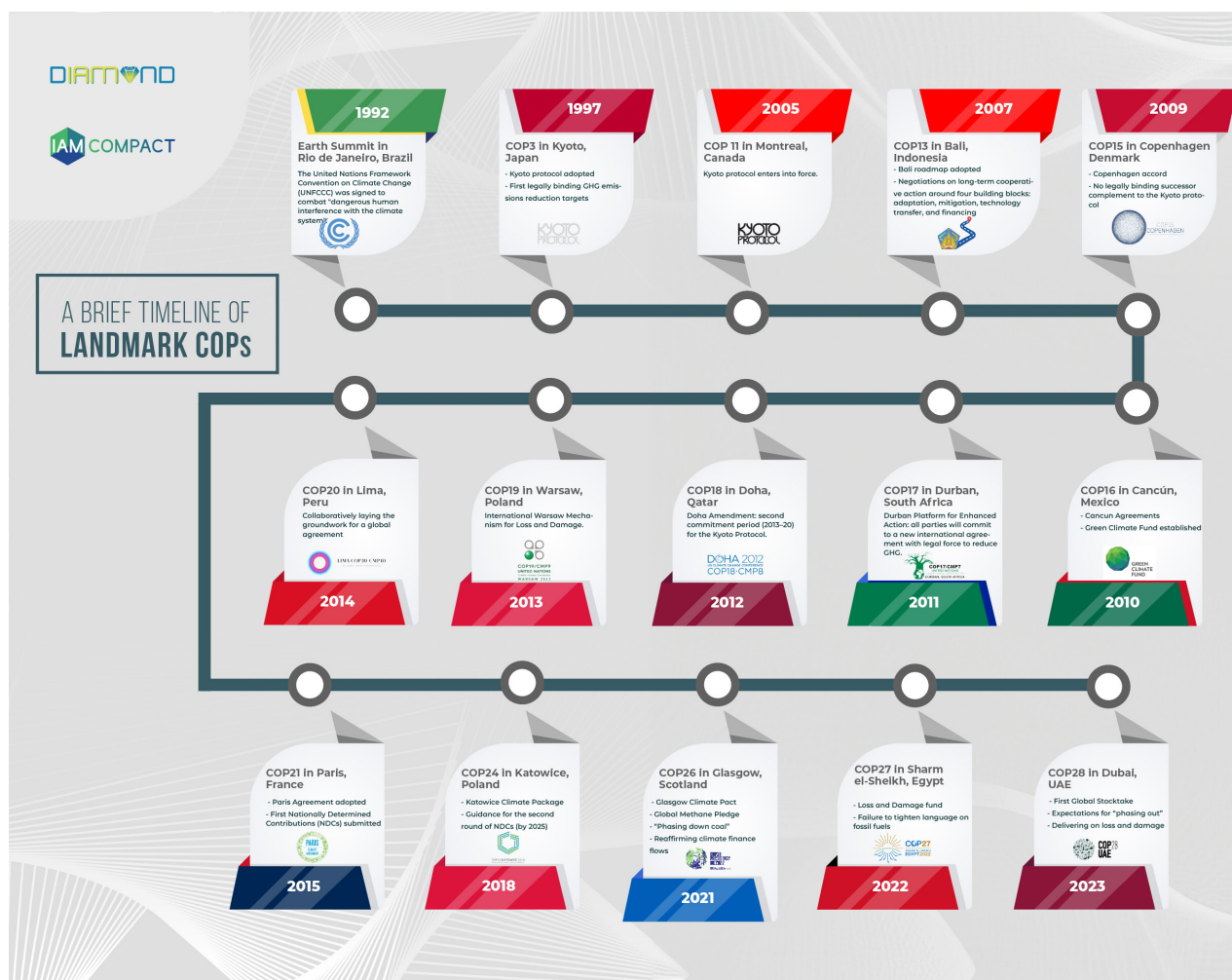


Figure 136. 'November 2023: A timeline of landmark COPs' Infographic

11.11 Ethiopia: barriers, drivers, policy options, and model development

This infographic demonstrates expansion and development of technical and institutional capacity in Ethiopia.

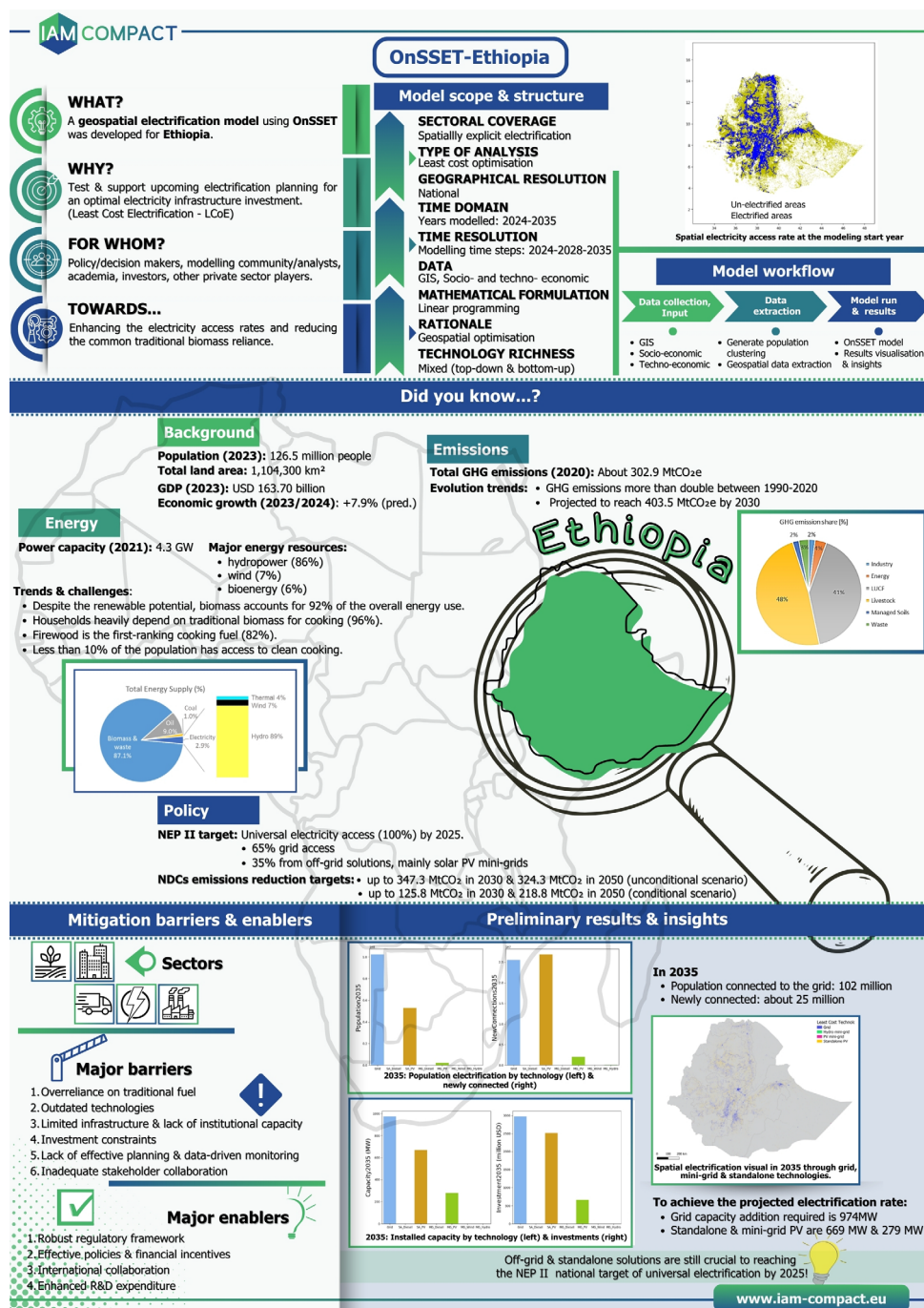


Figure 137. 'Ethiopia: barriers, drivers, policy options, and model development' Infographic

11.12 Kenya: barriers, drivers, policy options, and model development

This infographic demonstrates expansion and development of technical and institutional capacity in Kenya.

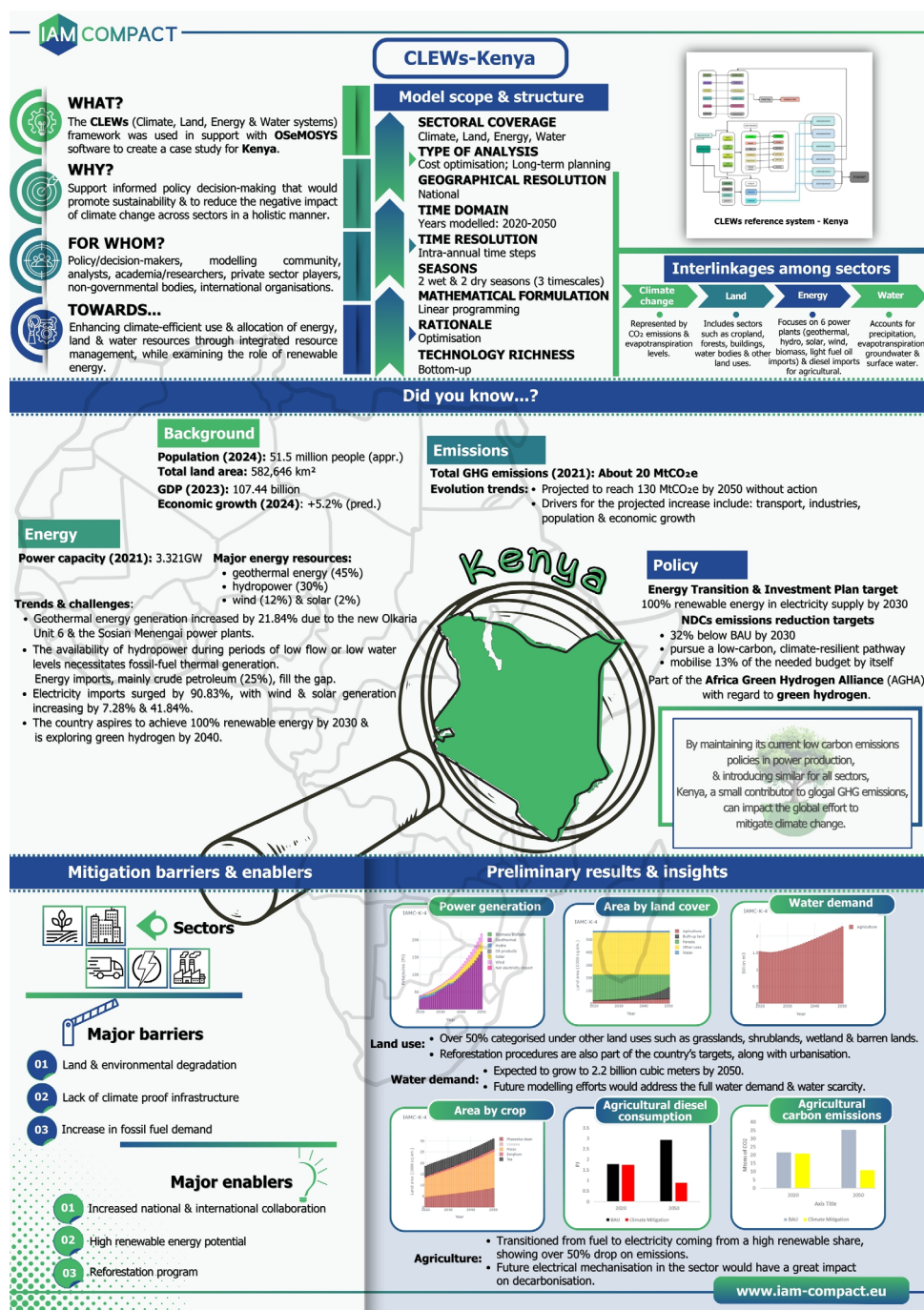


Figure 138. 'Kenya: barriers, drivers, policy options, and model development' Infographic

11.13 Sri Lanka: barriers, drivers, policy options, and model development

This infographic demonstrates expansion and development of technical and institutional capacity in Sri Lanka.

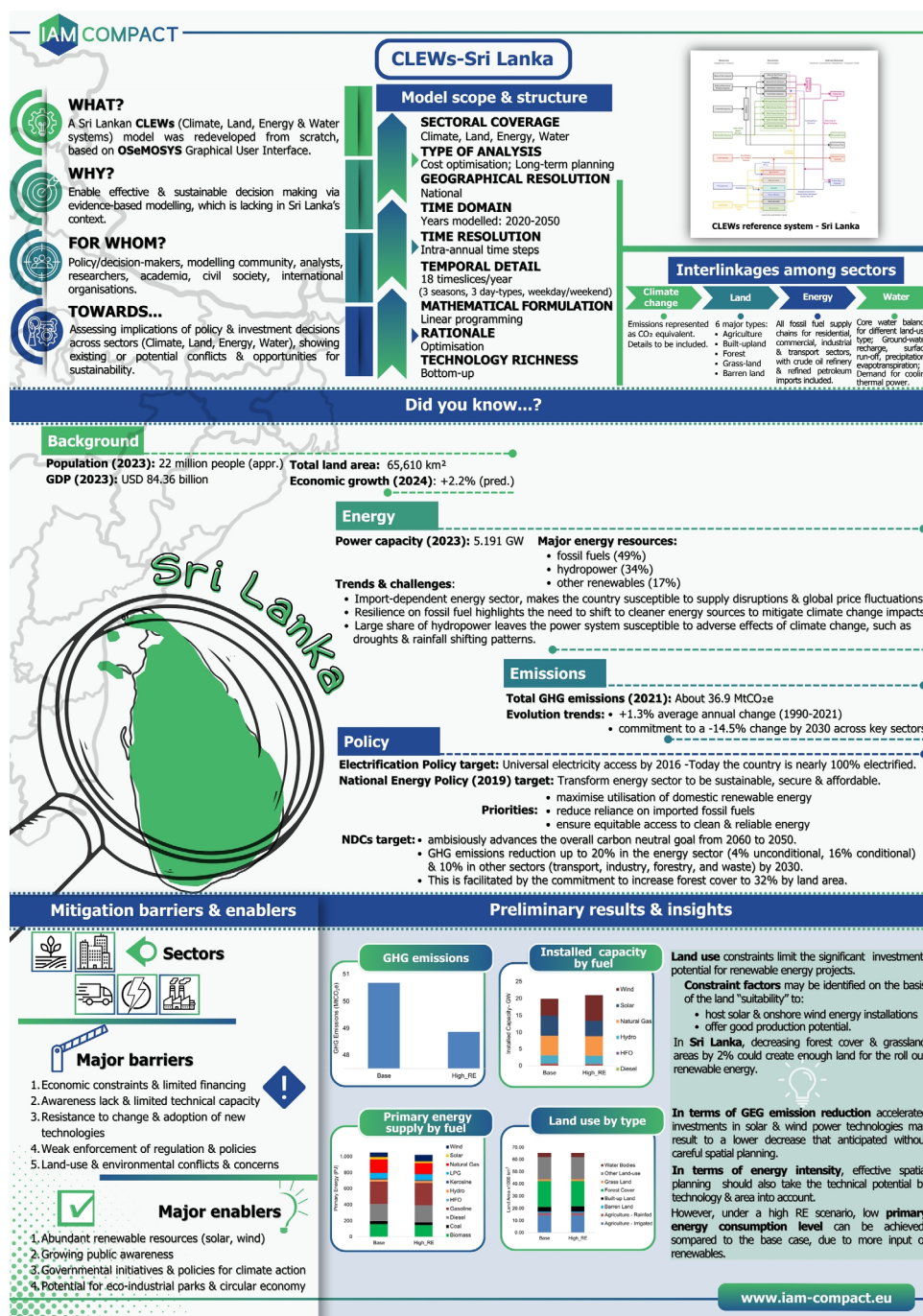


Figure 139. 'Sri Lanka: barriers, drivers, policy options, and model development' Infographic

11.14 Ukraine: barriers, drivers, policy options, and model development

This infographic demonstrates expansion and development of technical and institutional capacity in Ukraine.

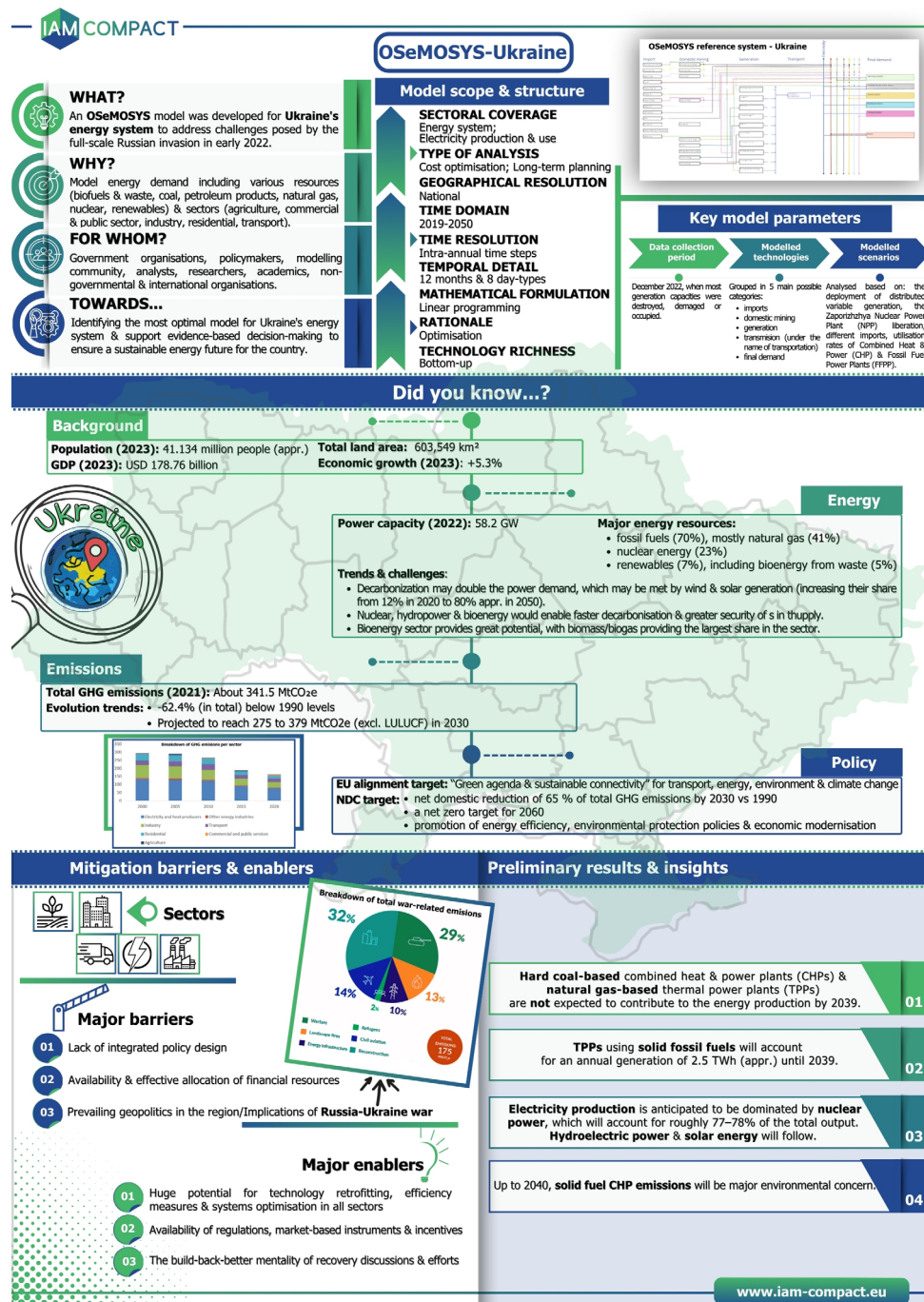


Figure 140. 'Ukraine: barriers, drivers, policy options, and model development' Infographic

11.15 CLEWs-Ethiopia: model co-development

This infographic demonstrates the CLEWs-Ethiopia model scope, structure, and preliminary results..

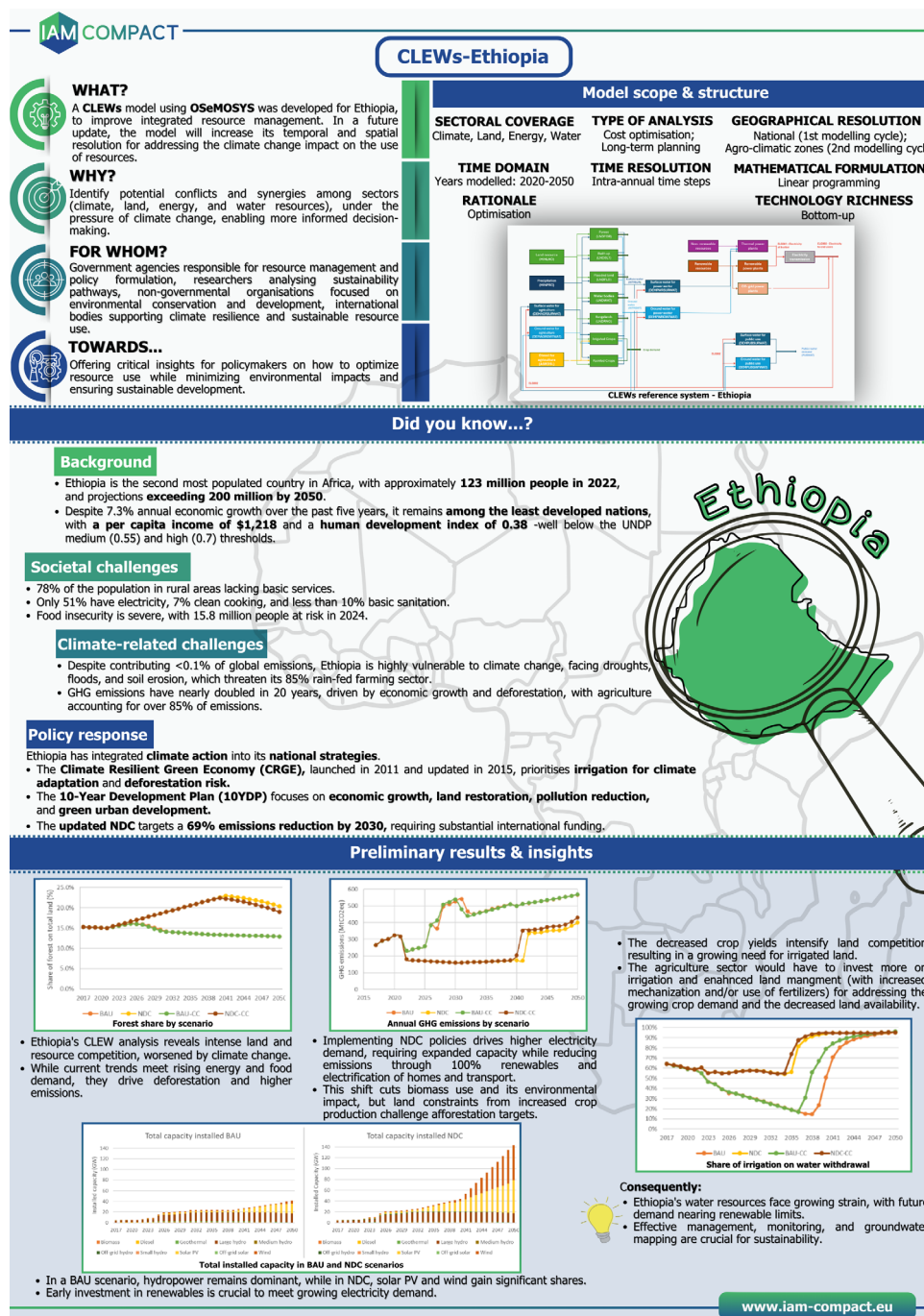


Figure 141. 'CLEWs-Ethiopia: model co-development' Infographic

11.16 MEDUSA – Modelling Equity and DistribUtional impacts for Socioeconomic Analysis

This infographic demonstrates the MEDUSA tool structure, and potential links with Integrated Assessment Models.

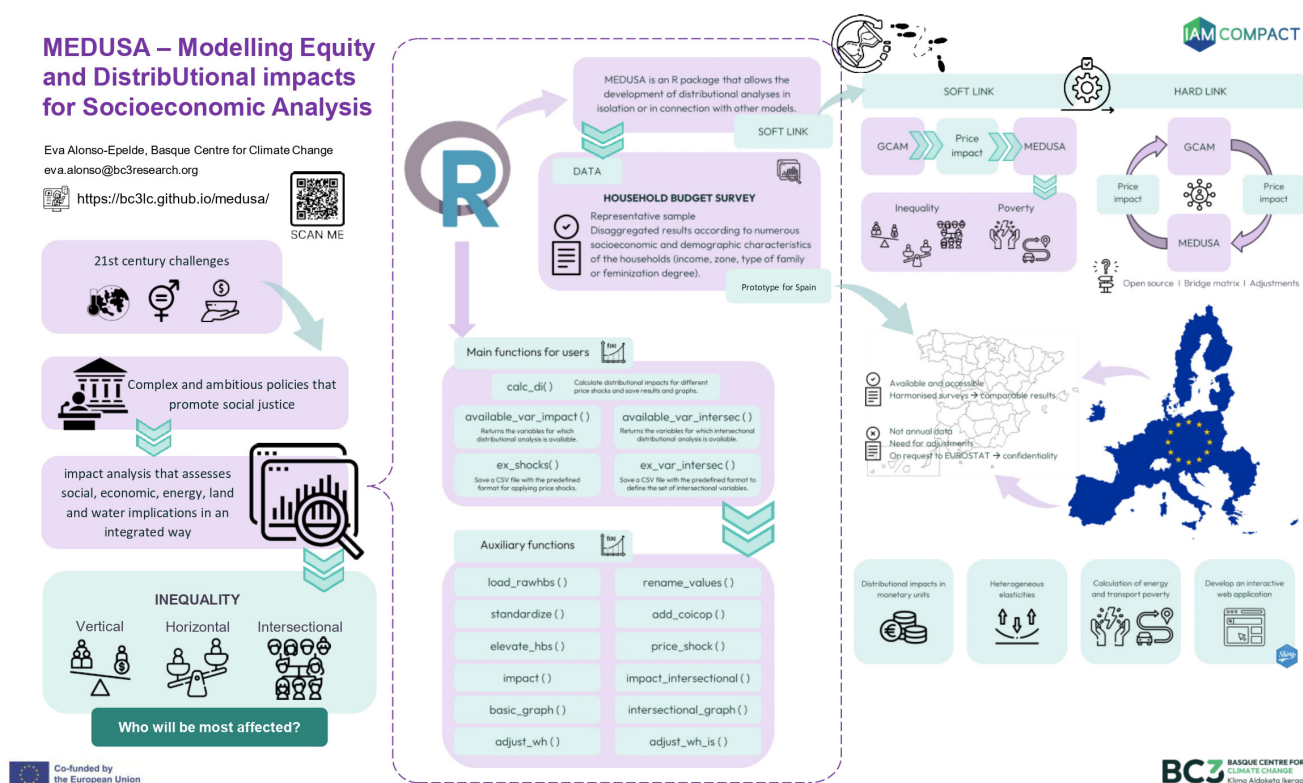


Figure 142. 'MEDUSA – Modelling Equity and DistribUtional impacts for Socioeconomic Analysis' Infographic