



The Global Chessboard: The Political Economy of International Climate Agreements

3rd ELEVATE International Stakeholder Workshop



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Colophon

Written by: Gaia Campanelli (Climate Strategies)

Project coordination: Detlef van Vuuren (project leader, Netherlands Environmental Assessment Agency (PBL)) and Isabela Schmidt Tagomori (project manager, Netherlands Environmental Assessment Agency (PBL))

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1. Introduction

1.1 The Global Chessboard: Political Economy of International Climate Agreements

This report offers a comprehensive summary of the III Elevate Co-Creation Workshop, which was held in Bonn on the 5th of June 2024. The event brought together more than 35 people at the forefront of climate research, action and political leadership in 20 countries.

The workshop provided an opportunity for a two-way knowledge exchange between project researchers and stakeholders on key international climate policy topics, including:

- The interplay between geopolitical shifts and climate agreements;
- Effective climate policy pathways to accelerate global action;
- The international governance of carbon dioxide removal;
- The impact of international trade measures on global ambition, with a focus on the EU Carbon Border Adjustment Mechanism.

The full workshop agenda and speakers' slides are available on the [ELEVATE website](#).

ELEVATE partners shared cutting-edge research insights with practitioners and decision-makers, whom in turn were invited to provide the feedback necessary to align the key academic objectives of the project to concrete policy needs.

This iterative process of knowledge co-creation aims to facilitate the development of a new generation of net-zero pathways, while striving to address the implementation gap and working towards a just global transition. The event was the third of a series of international workshops organised by the ELEVATE project.

Key takeaways

- Safeguarding international cooperation is essential to achieve climate action within the timeline established by the Paris Agreement.
- As geopolitics reshape the flow of climate finance, the Global South faces complex challenges in sustaining climate ambition. It is critical that models represent these interdependencies to inform effective decision-making.
- Exclusive focus on GDP can mask the nuanced socio-economic dimensions critical for equity and justice. Mitigation scenarios must incorporate additional indicators to capture this complexity.
- Co-creating climate scenarios is a complex exercise due to uncertainty about future developments, requiring the inclusion of diverse trajectories shaped by evolving policies, technologies, and socio-economic dynamics. Improving future projections depends on accounting for varying levels of policy implementation and capturing interactions across governance levels.
- The concept of Carbon Debt offers a framework to operationalise fairness and justice in climate action, accounting for regional responsibilities for CDR deployment after the exhaustion of our Carbon Budget. However, the concept can be interpreted differently according to countries' opinions around overshoot and CDR technologies and governance.
- Trade policies targeted to climate mitigation have the potential to ramp up international climate policy. However, their macroeconomic effects, as well as the distributive impacts on specific countries and sectors, need to be further investigated.



Participants at the workshop

Workshop Report

2.1 Exploring the interplay between geopolitical shifts and international climate policy

In this plenary session, ELEVATE researcher Lara Aleluia Reis explored the interplay between geopolitical shifts and international climate policy, followed by a diverse panel of stakeholders, moderated by Elmar Kriegler.

The research presentation demonstrated the latest modelling insights, exploring the impacts of different geopolitical scenarios on climate, resource and economic indicators. The research was developed to respond to increasing geopolitical tensions between nations, and to consider whether these shifts are helping or hindering the green transitions. The model explored 5 scenarios, summarised below:

1. “Naive World”: This is a baseline scenario that assumes no additional import tax on carbon.
2. “National Protectionism”: This scenario assumed imported emissions are taxed extra, at the same rate as the national carbon tax.
3. “Total Retaliation”: This scenario assumed imported emissions are taxed extra, at the maximum between the world average carbon price and the national carbon price.
4. “Green Race”: Assumed that import tax is used to invest in green and low-carbon energy technologies.
5. “Technological Autarchy”: Assumed that there is no knowledge sharing between countries on technological solutions.

In the first three scenarios, fossil fuel use decreased, and renewables increased, but this reduction failed to keep the temperature under 2°C by the end of the century. There were also increases in electricity prices, along with GDP losses and reduced trade between countries. In the “Technological Autarchy” scenario, fossil fuel use decreased, but electricity prices increased as new technologies for low-carbon energy are capital-intensive. In the “Green Race” scenario, renewables increased, overall consumption decreased, and GDP increased. However, in this scenario, there was a high risk of depleting critical raw materials by the end of the century.

Participants expressed interest in understanding whether the NDCs inputted into the model considered unconditional pledges, and this was highlighted as an area for future research. The research presentation was followed by a stakeholder panel including speakers from the US, Nigeria and Zambia, bringing in perspectives from academia, national policy and youth-led climate action.

The panellists were asked to answer the questions:

1. How are political shifts redefining the landscape of climate policy?
2. What geopolitical changes have impacted your country's climate policies, and how?

Panellists highlighted that diplomatic fallout in Europe has delayed activities for COP29, while conflicts are also straining financial resources for climate use. Elections around the world also create a level of uncertainty on climate finance and follow through on GST commitments. Participants also expressed that in many cases, climate action is based on financing, which is linked to shifting geopolitical relationships and priorities. In some countries, particularly in the Global South, dependence on funds from 'competing' global powers (e.g., China and the USA) can make it difficult for countries to independently pursue their sustainable development priorities and secure climate finance.

The panel received questions related to opportunities to increase equity through bilateral and multilateral engagements, as well as whether the UNFCCC remains 'fit for purpose' in the light of ongoing geopolitical shifts. Panellists indicated that thinking about GDP through the lens of natural capital accounting would increase equality. They also highlighted the importance of managing increased demand on critical raw materials, given ecosystem impacts, and the need to invest in green technology in countries in the Global South to equalise climate action.

Key Takeaways:

- Geopolitical shifts affect climate finance, which has knock-on effects for climate ambition, particularly in the Global South. Developing models that consider these linkages is key for Global South countries.
- Scenarios could explore the impacts of various geopolitical scenarios on ecosystems, particularly as a source of natural capital accounting, as an additional metric in addition to impacts on GDP. This also provides an opportunity to link findings with critical raw material needs and the potential impacts of sourcing the critical raw materials required for various scenarios.
- The analysis could also include impacts on social measures in addition to GDP, as GDP does not always translate into enhanced equality or justice.
- The scenarios could be deepened to compare conditional and unconditional climate pledges.

2.2 Analysing the impact of international trade measures: will the Carbon Border Adjustment Mechanism ratchet up climate ambition?

2.2.1 Topic Introduction and Research Findings

ELEVATE researcher Zoe Vrontisi (E3Modelling) presented preliminary findings from an assessment of the impact of the Carbon Border Adjustment Mechanism (CBAM) established by the EU in 2023. CBAM assigns a price on carbon emitted for certain goods imported into the EU, covering the cement, iron and steel, aluminium, fertilisers, hydrogen and electricity sectors. During an initial phase, importers will gradually be required to declare the emissions embedded in their products and, unless a carbon price has already been paid during the production phase, they will be required to surrender the corresponding number of certificates every year. CBAM is expected to be fully implemented from 2026 onwards. Researchers employed a model representing the interactions between economic, energy and policy systems to analyse the implications of CBAM for the European and foreign economies.

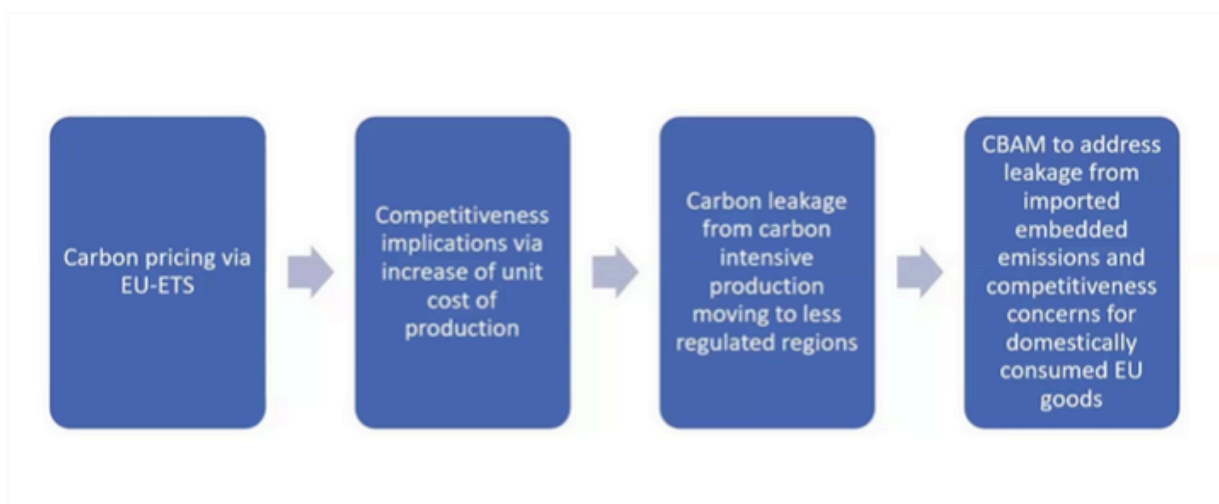


Figure 1. Understanding CBAM implications for the EU.

In the simulations, researchers assessed the implications of CBAM based on the level of cost pass-through to consumers, the recycling of revenues, and the possible responses from trading partners as retaliation measures on EU exports, like the establishment of their own carbon price. The key hypothesis for the study is that, if CBAM revenues are re-directed towards “green” policies (e.g., improving energy efficiency), the mechanism could have positive impacts in increasing EU GDP and avoiding carbon leakage. In the absence of appropriate revenue recycling schemes, the measure is expected to have negative impacts on employment, albeit retaining the environmental benefits.



Figure 2. Criteria influencing implications of EU CBAM for trading partners.

Research findings are still in a preliminary phase and were presented to stakeholders as a starting point for the discussion.

- **Direct impacts of CBAM for EU exporting partners:** preliminary results from a country-case study suggest possible negative GDP impacts associated with loss of exports and a decline in private consumption, while, in the absence of adaptation measures, affected sectors could face production loss and negative effects on employment. Researchers further hypothesised that CBAM might lead only to a small drop in emissions, highlighting the need for more transformative domestic policies to drive investments in key sectors.
- **Global impacts of EU CBAM:** The results of a global simulation showed that, in the short term, CBAM could have negative impacts on EU GDP due to lower competitiveness; moreover, while CBAM is expected to reduce imports and increase domestic production of the products covered by the policy, all the other sectors, especially downstream ones, are projected to face a production drop.

Paola Rocchi (CMCC) presented additional research on the policy, with a different focus (the findings of this study are in a preliminary stage):

1. Analyse the environmental and macroeconomic impacts of EUCBAM within the specific scope and timeframe of the policy.
2. Analyse CBAM in the context of domestic mitigation measures that would allow non-EU countries to obtain an EU CBAM exemption, with a focus on China.

In terms of environmental impact, the model showed a limited global decrease in CO₂ and marginal positive effects on EU GDP. Looking at bilateral trade, there were significant impacts for EU imports, and an increase in intra-EU trade. The model also showed some positive effects for the US due to the decrease in competition.

In the “alternative scenarios” assuming a more stringent Chinese ETS, a Chinese ETS on cement, or that more countries will introduce an ETS, the results vary — China experiences a more negative impact on GDP and more significant CO₂ reductions. In terms of next steps, the researchers will improve model granularity for CBAM commodities and analyse the impacts of the policy on international trade in the alternative policy scenario.

Following the research presentation, a panel of stakeholders from the Netherlands, the US, China and Brazil discussed the following question:

How will the EUCBAM influence global emissions? Are there any interventions that could help better achieve EU CBAM’s goals to ratchet up climate ambition?

- From an EU perspective, the CBAM was introduced mainly as an environmental measure aligned with the EU Emissions Trading System (ETS), aiming to prevent carbon leakage and maintain industrial competitiveness. The measure is expected to support an increase in carbon price mechanisms, and the Union will provide support for other countries seeking to understand and potentially replicate elements of the ETS. Enhancing international cooperation and technical assistance is seen as key to advancing global ambition.
- Chinese studies showed impacts similar to those identified in the ELEVATE findings, with energy-intensive export sectors—particularly chemicals, plastics, ceramics, metals, and paper—most affected due to their dependence on coal-powered electricity. While the CBAM could incentivise improvements in China’s carbon market, such as raising carbon prices and were highlighted. These include potential conflicts with the principle of Common But Differentiated Responsibilities (CBDR), limited global emissions reductions, and increased global mitigation costs. Concerns were also raised about potential welfare and social impacts, particularly on the industrialisation processes in developing countries.
- From the US perspective, CBAM can be a catalyst for advancing carbon pricing discussions. Interest is growing in using trade measures to drive emissions reductions, with Congress recently considering six proposals that include some form of border carbon adjustment. The Biden administration has established a task force to explore “smart climate and trade policies,” focusing on preventing carbon leakage and dumping through credible, transparent data, while working to ensure interoperability between systems globally.

- The Brazilian speaker expressed scepticism about the CBAM's potential to reduce global emissions, viewing it as a unilateral measure implemented without broad international consultation. The policy is perceived as imposing carbon pricing on other countries, potentially triggering retaliatory measures. Brazil emphasised the importance of strengthening a fair and inclusive multilateral trade system to address climate and trade challenges collaboratively.

Key Takeaways:

- Trade policies aimed at climate mitigation have the potential to stimulate international climate policy responses and generate meaningful environmental impacts. However, their full economic, environmental, and governance implications require further investigation.
- While the overall macroeconomic effects of the current EU CBAM may be relatively limited, targeted country-level and sector-specific case studies are essential to better understand localised impacts and guide more nuanced policymaking.
- Although environmentally motivated, trade-related climate measures must be carefully designed to avoid protectionist outcomes and retaliatory responses. Given the geopolitical sensitivities involved, it is important to cultivate open dialogue and cooperation between countries. The consequences of differing approaches should also be systematically assessed.
- The welfare implications of climate-related trade instruments warrant deeper exploration. The way revenues from such mechanisms are allocated will significantly influence their distributive effects, both within individual countries and across the global landscape.

2.3 Co-designing climate policy pathways to accelerate global action

2.3.1 Topic Introduction and Research Findings

In this interactive session, researchers Isabela Schmidt Tagomori (PBL) and Elena Hooijschuur (PBL) facilitated a dynamic conversation about the Current Policies Scenarios and invited workshop participants to explore different scenario extension methods.

The Current Policies Scenarios are extensively featured in climate research, including key climate reports, namely IPCC and UNEP Emission Gap Reports. However, the term ‘current policies’ is often subject to varying interpretations. According to the definition, the Current Policies Scenario encompasses policies that are adopted by governments through legislation, or non-binding targets backed by effective policy instruments. Notably, these scenarios do not account for ambitions and pledges, such as Nationally Determined Contributions (NDCs), which are reflected in the NDC scenario instead. Consequently, despite most workshop participants being familiar with the Current Policies Scenario, their views on what are considered 'current policies' still differed at the beginning of the session.

Another crucial question the researchers have raised is what assumptions should underpin scenario design up to the year 2100, given the future’s inherent uncertainty. Current policies typically extend to 2030 or 2040; however, to compare them with 1.5 or 2 degrees scenarios and to indicate long-term effects of these policies, we need to extend the scenarios until the end of the century. Ideally, transition should lead towards net-zero emissions, contingent on the continuation of the current “good practice” policies that could progressively result in lower emissions. Conversely, a business-as-usual scenario might result in higher emissions due to a lack of significant policy changes. Thus, when designing the pathways, it is crucial to explicitly discuss and align on the assumptions we all make about the future, taking into account different perspectives. Co-creating the policy pathways with stakeholders can help to ensure that developed scenarios are realistic and grounded in a shared understanding of potential future developments.

To extend the scenarios into an unpredictable future, researchers can apply different extension principles:

- **Carbon price:** Finding the economy-wide carbon price (per region) that would lead to the same emission levels as current policies. To represent constant mitigation efforts, this carbon price is continued.
- **Policies:** Keeping the policies stable where possible.

- **Emission reductions:** Keeping emission reductions resulting from current policies stable.
- **Emission levels:** Keeping emission levels resulting from current policies stable.
- **Pathway selection:** Selecting existing scenarios that are similar until 2040 or using a predefined scenario and constructing the pathway until 2100 from those.
- **No more policies:** Assuming there are no more policies after the target years for current policies have passed.

Workshop participants had an opportunity to explore and discuss the presented methods in groups. More specifically, groups were asked to extend the Current Policies pathway by drawing the line after 2030 on the presented scenario (see image 3). The questions covered in the group discussions included:

- What do you think a global emissions pathway reflecting current policies should look like after 2040? Why?
- Would your answer be different for your own country? Why?

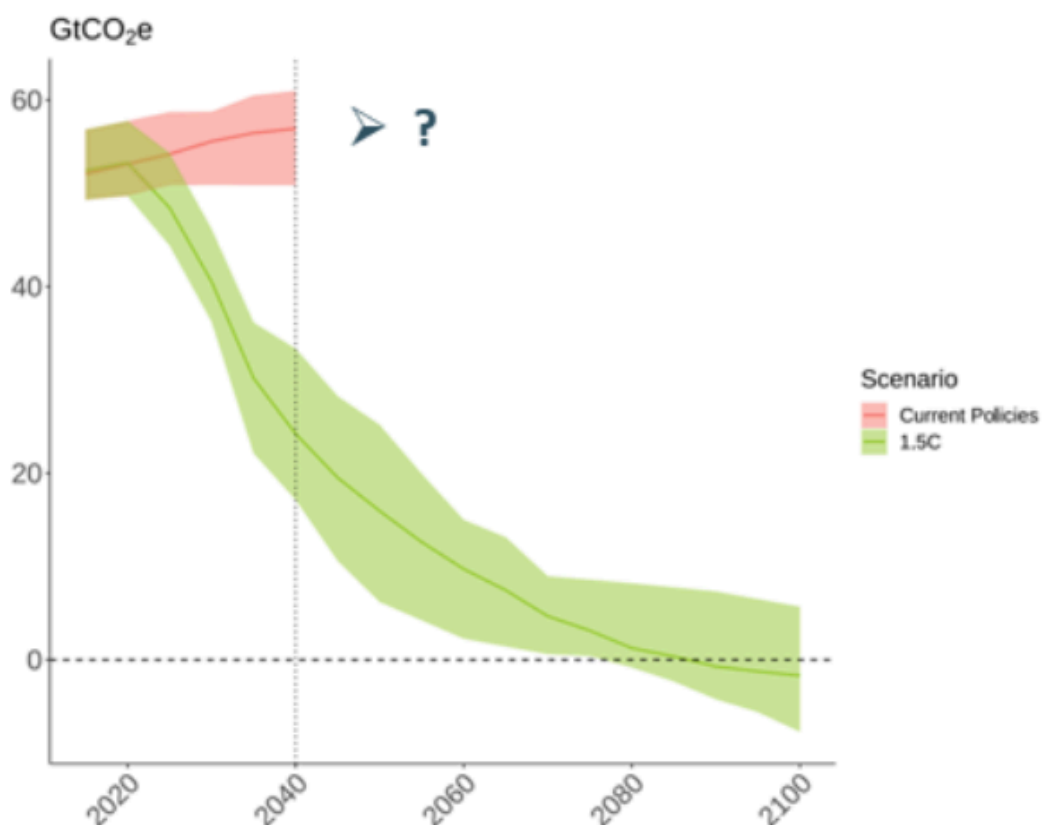


Figure 3. Template for scenario extension exercise.

2.3.2 Key outcomes and stakeholder insights

Stakeholders have reflected the difficult nature of this exercise due to ambiguity over the future and highlighted the importance of such discussions. Divided into three separate groups, participants have produced different representations of potential scenario extensions. For instance, while one group aligned on a trajectory showing slowly declining emissions up to 2100, another group projected emissions to increase. A third group opted to extend the scenario with two separate lines: one illustrating the gradual decrease of the emissions due to the advancement of implemented policies, and the other reflecting the growth of emissions under 'business as usual' conditions.

One of the participants noted that uncertainty may be a key factor and, to account for this effectively, it is important to incorporate a range of possibilities. Moreover, stakeholders were interested to learn that the Current Policy scenarios are adjusted every year and proposed that examining these past corrections could allow us to refine our approach to future projections. Another crucial aspect raised by stakeholders included the role of policies in addressing climate impacts.

Participants asked if researchers might consider broadening the uncertainty framework to accommodate the evolving climate dynamics. Understanding whether these changes are positive or negative to mitigation efforts is essential. Additionally, it was suggested to integrate the dynamics of the green race and market forces into the scenarios.

Experts also pointed out that modeling future emissions scenarios involves many complexities beyond policy alone. For instance, the adoption rate of electric vehicles also depends on factors such as public acceptability. Stakeholders have speculated that if public acceptance increases or states adopt successful examples from others, policy adoption would be expected to accelerate. Thus, it is critical to reflect on differing levels of policy implementation and technological uptake. Participants also highlighted a challenge of accurately capturing the interplay between federal and state policies to avoid the potential double-counting of policies.

Finally, participants were invited to evaluate the presented extension principles for Current Policies scenarios (see Figure 4). The majority of participants expressed the highest preference for keeping the policies and emission reductions stable. Lowest preference was given to the approach assuming no more policies are implemented after the target years for current policies have passed.

Overall, stakeholders agreed that navigating the complexity of scenarios is a challenging exercise, especially when there is confusion between current policies and their future projections.

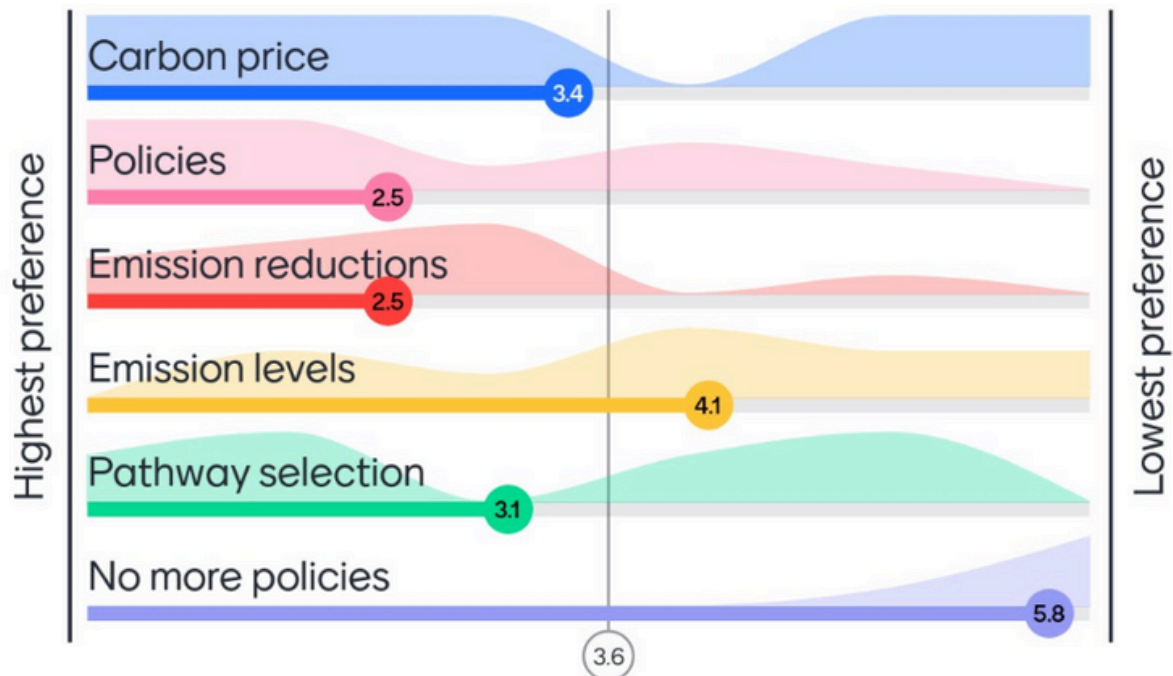


Figure 4. Preferences for different extension principles for Current Policies scenarios collected using Mentimeter.

Key Takeaways:

- The definition of ‘current policies’ should be clearly communicated among practitioners to ensure consistent interpretation.
- Co-creating policy pathways with stakeholders plays a critical role in discussing different perspectives and aligning on the assumptions made about the future. This helps to ensure that developed scenarios are realistic and policy relevant.
- ‘No more policies’ was not seen as a relevant assumption for future mitigation pathways.
- Green race, market forces and varying levels of policy implementation and technological uptake could be considered when extending different policies in the future.

Relevant links -

Gütschow J., Jeffery M. L., Schaeffer M., & Hare B. (2018). Extending near-term emissions scenarios to assess warming implications of Paris Agreement NDCs. *Earth's Future*, 6, 1242–1259. <https://doi.org/10.1002/2017EF000781>

2.4 Discussing the Governance of Carbon Dioxide Removal

2.4.1 Topic Introduction and Research Findings

The interactive session facilitated by researchers Elina Brutschin and Setu Pelz (IIASA) focused on carbon dioxide removal (CDR), its role in mitigation scenarios, and how to fairly govern the deployment of these technologies.

The Integrated Assessment Models (IAMs) explore the interactions between socioeconomic, energy and land systems and are a key tool for the scientific evaluation of climate targets against global temperature and emission levels. The models show that at the current state of climate action, the world is likely to exceed the goal of 1.5°C, an event referred to as temperature overshoot. Bringing temperatures down from overshoot would require fast decarbonation and synchronised efforts to achieve net negative emissions. CDR technologies are increasingly considered an important tool in reducing and stabilising emissions. They can be classified as conventional CDR (methods related to changes in land use and forestry) or novel CDR (innovative technologies such as biochar, DACCS1 or BECCS2). It has been observed that conventional CDR have a higher degree of social acceptance because in the public imagination, they relate to a “natural” rather than technology-based solution. The delay in the implementation of other mitigation tools and the parallel rise of interest in CDR begs the question of **whom should be responsible for the governance of these technologies, and what aspects should be prioritised in regulating their deployment.**

Fairness and equity are important components of this debate. The researchers argued that, for these aspects to be integrated into governance, it is necessary to define them in more unambiguous terms. “Carbon debt” was proposed as a comprehensive conceptual tool to combine considerations of past carbon emissions, remaining carbon budget and future responsibilities for carbon dioxide removal. Carbon debt is the difference between “fair” carbon allocations (as defined by each party following their own fairness principles) and expected emission trends based on current targets. The measure allows us to identify when regions are in “debt” or “credit” — i.e., expected to exceed or stay within their allocated fair share of carbon. As this calculation results in differentiated responsibilities toward overshooting, it can also be used as a metric to determine CDR responsibilities.

The researchers specified that this concept does not imply a top-down allocation of “fair shares”. Rather, it is a tool to support transparency and science-informed policy decisions. Regardless of the specific fairness principles that will be used to determine a region’s fair share,

carbon debt allows to identify how current climate action translates into proportional overshoot responsibilities in the future – and can guide national policymaking accordingly. Carbon debt provides a conceptual jump from carbon budget because, instead of focusing on an ever-shrinking carbon allowance, it allows to link current climate action to future responsibilities for temperature overshoot and CDR deployment.

The researchers invited the participants to fill in a survey at the beginning and at the end of the session, to evaluate whether the concept of carbon debt and related discussion would influence their opinions. The questions included the evaluation of the level of climate ambition for different regions, based on their current pledges; considering different approaches for a “fair” allocation of carbon emission reduction targets; and the efficiency of different mitigation options for achieving global climate goals. Participants were asked to consider the effectiveness of the carbon debt measure in their own professional sphere and to provide suggestions for further research. Finally, the researchers presented different CDR market types, asking participants which was the most desirable framework for the future.

2.4.2 Key takeaway from stakeholders:

Stakeholders pointed out that, when pondering which mitigation options are important to achieve global climate goals, it is crucial to specify the timeframe of consideration for each method. As we look further into the future, the interrelations between emission pathways, CDR deployment pathways and their influence on temperatures become more difficult to predict. Moreover, CDR is at risk of becoming a mitigation deterrent, as countries are already designating these technologies as means to compensate national emissions, even when these could be abated. Stakeholders indicated that carbon markets connected through government or with restrictions were the most desirable option for responsible CDR deployment in the future. According to one participant, integrated markets should definitely be avoided in order to keep emissions reduction targets and removals policies separate.



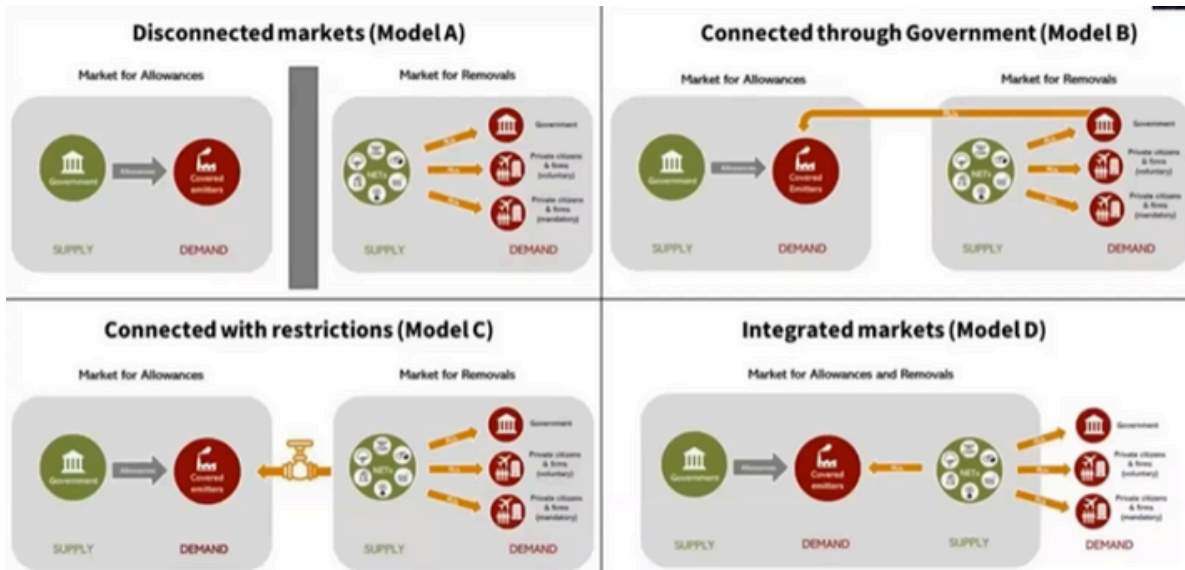


Figure 5 . Possible CDR market frameworks

A negotiator participating in the workshop observed that the concept of carbon debt could be very useful for her work, especially as some of its characteristics align with important UNFCCC concepts, such as CBDR&RC3. However, she warned that talking about overshoot in the negotiation rooms might not be yet acceptable, as it could imply that parties are not aiming for the 1.5°C target anymore. Another participant pointed out that CDR is not currently accepted by all parties as a way to achieve the goals of the Paris Agreement. Even if the last IPCC report mentions CDR technologies, there is still no consensus around their deployment.

Stakeholders further observed that not all CDR methods are equally reliable. Land-based methods, in particular, should be considered primarily as opportunities for nature enhancement rather than primarily removal techniques, given their frailty in the face of extreme weather events and other climate change impacts. For this reason, it is crucial to support initiatives promoting awareness of CDR and their key qualities (e.g., permanence, the potential for the removal to be sustained for a sufficient period of time to deliver climate repair), to advance science-based conversations around public acceptability and responsible deployment.

Key Takeaways:

- The concept of carbon debt was created with the aim of aiding parties to measure their accountability for overshoot against self-defined fairness principles. Due to its flexibility, the concept can be used to define regional responsibilities for future CDR deployment as well as to promote transparency and fairness in NDCs.
- Overshoot is still a sensitive topic in international negotiations and CDR is still not globally recognised as a tool to achieve the goals of the Paris Agreement. It is important to consider these aspects when discussing means to operationalise fairness and justice in climate negotiations.
- Increasing public knowledge of CDR technologies, their specific characteristics (e.g., permanence) and their governance options is fundamental for starting inclusive conversations around responsible deployment.

Relevant links:

Pelz, S. et al (2025) Using net-zero carbon debt to track climate overshoot responsibility, Proc. Natl. Acad. Sci. U.S.A. 122 (13) e2409316122, <https://doi.org/10.1073/pnas.2409316122>

About us

ELEVATE aims to develop new scientific insights to support the preparations of Nationally Determined Contributions (NDCs) and national climate policies focused on achieving net-zero emissions in line with the Paris Agreement. The project is developed by a transdisciplinary consortium of national and international climate research teams interacting actively with policymakers and other stakeholders in climate policy and the Sustainable Development Goals (SDGs).

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