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Editorial.

Over the past several months, the U.S. energy landscape has experienced one of its more pronounced shifts in recent memory. Dramatic policy reversals are unfolding against a backdrop of deep structural change in energy markets: for the first time in decades, forecasts point to substantial electricity load growth, driven in large part by surging investments in data centers and the rapid expansion of computational demand in the race for AI leadership. Rising electricity prices, in turn, are beginning to stir concerns about distributional and competitiveness impacts, an issue likely to gain policy maker attention in upcoming election cycles. Meanwhile, global oil prices have softened and upstream investment, activity levels, and discovery rates are declining, even as renewable energy deployment accelerates across much of the world.

Directional change in U.S. federal energy policy undoubtedly stands to influence energy markets in the years ahead. With passage of the One Big Beautiful Bill Act, Congress has curtailed a range of federal incentives for clean energy deployment and manufacturing. Coupled with the administration's recent decision to terminate over 300 financial awards for projects deemed economically unviable or inconsistent with national priorities, as well as the expected tilt towards nuclear and fossil fuel activities in the Energy and Water Appropriations Bill for Fiscal Year 2026, federal energy policy is undergoing a sweeping reorientation that has sent ripples across project developers and through research and development communities.

Trade and industrial policies have reinforced this direction. Expanding tariffs and supply chain restrictions targeting foreign entities of concern have raised costs for key inputs such as solar modules, batteries, and critical minerals. These same measures have also driven up prices for commodities like steel and aluminum, affecting oil and gas producers that depend on them for exploration equipment and transport infrastructure. International retaliation has added further uncertainty, as partners adjust their own trade barriers and incentives in response. Whether these shifts can override underlying market and technology trends as well as state policy frameworks to fundamentally derail the U.S. energy transition, however, remains to be seen. What is clear is that the United States is charting a policy trajectory that increasingly diverges from many of its peers. Allies in North America and across the Atlantic continue to pursue their transition to decarbonized energy systems, albeit with some adjustments to the pace and scale of the transition. China, meanwhile, is pursuing what some observers have coined an "electrostate" strategy – retaining coal capacity even as it deploys record levels of solar, wind, and storage to electrify its economy and achieve independence from energy imports. By contrast, the U.S. appears to be doubling down on domestic resource development and conventional energy security. The outcome of this contest between profoundly divergent paradigms has ramifications far beyond the energy sector, highlighting the growing intersection of industrial policy, energy security, and geopolitical strategy.

As in previous cycles of retrenchment and reform, the current moment invites both caution and perspective. Market forces, declining technology costs, and subnational initiatives may continue to advance decarbonization despite federal headwinds. Yet policy volatility complicates long-term investment and planning at home and abroad. At such times, rigorous, non-partisan research remains indispensable to distinguish transient policy shifts from enduring structural trends. MIT CEEPR remains committed to providing analytical clarity and a forum for informed, fact-driven dialogue on the forces shaping the evolving global and domestic energy landscape.

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Contents.

Research.

The Economic Logic of Policies to Address Import Dependence in Clean Energy Goods

By: Michael Jakob, Matthias Kalkuhl, Robert Marschinski, Michael Mehling, and Joschka Wanner

Background

The increasing fragmentation of global supply chains and rising geopolitical tensions raise concerns about import dependence. These concerns are of particular importance for ‘clean energy goods’ – i.e. clean energy technologies and critical raw materials needed to produce them. These goods are not only essential for climate change mitigation, but are also seen as an important driver of future economic dynamics.

Our working paper contributes to the literature by analyzing causes of, and solutions for, import dependence in the language of market failures. This focus allows assessing different policies from a welfare economics perspective that accounts for trade-offs between different policy objectives. To our knowledge, only one previous study has attempted to explicitly relate policies addressing supply chain issues to specific market failures (Baldwin and Freeman, 2022), and our paper is the first to focus on clean energy goods.

In the working paper, we start out by conceptualizing import dependence. We then identify relevant market failures and policies to correct those market failures. We conclude with a brief discussion of policy implications.

Conceptualizing Import Dependence

We speak of 'dependence' when imports represent a high share of total domestic consumption and are sourced from few supplier countries or just one supplier country. Reducing import dependence is increasingly recognized as an important policy objective: in the European Union, for instance, the notion of ‘strategic autonomy’ has become a defining paradigm of international economic policy that prioritizes ‘de-risking’ of supply chains (European Commission 2023). Whereas some emphasize the importance of boosting domestic production in sectors of strategic importance (‘reshoring’), others have argued in favor of fostering trade relations with countries with strong economic ties and good diplomatic relations (‘friendshoring’) (Cerdeiro et al., 2024). In a similar vein, authors debate the extent to which ‘decoupling’ from certain trade partners is possible and desirable, or whether ‘derisking’ by diversification of import portfolios constitutes a more feasible policy option (Farrell and Newman 2019).

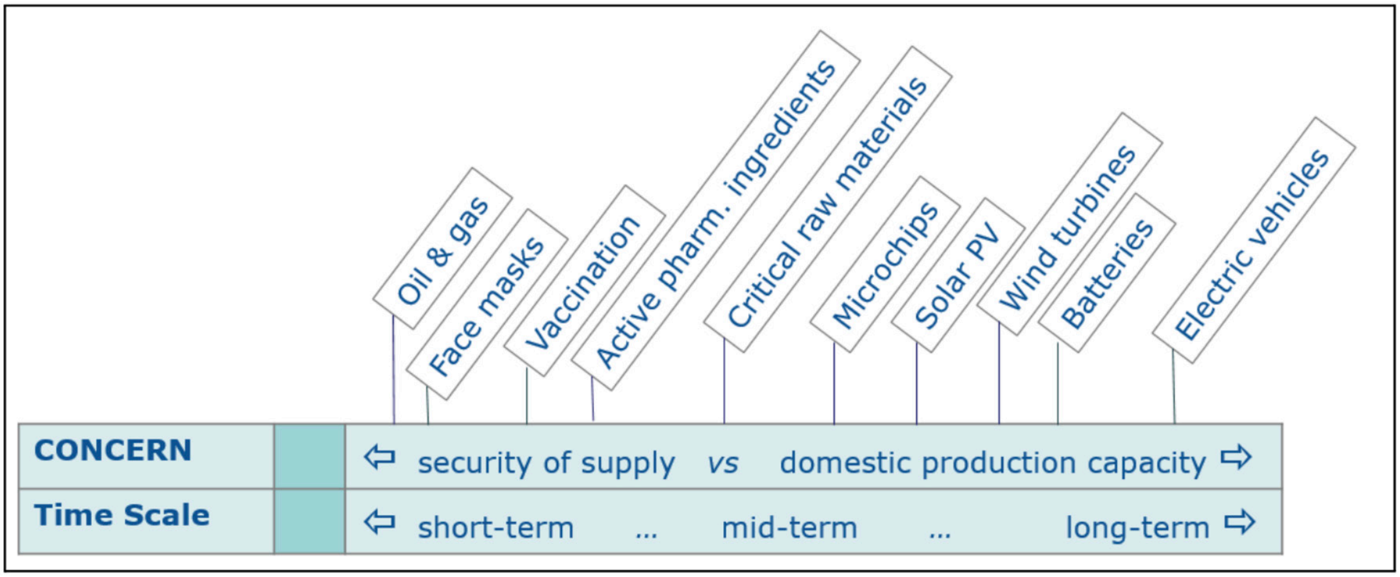


Figure 1. Conceptual diagram to systematize different aspects related to import dependence.
Note that the relative position of the specific issues shown at the top is indicative and mainly serves for the purpose of illustration.

Import dependence has been discussed for several issue areas, ranging from conventional energy imports, pharmaceutical substances, and medical equipment, to high-tech products as well as clean energy goods. For each of these commodities, specific reasons underlie the concern about excessive imports. These include, e.g., short-term energy security in the case of gas and oil imports, or crisis-preparedness for medical substances and devices. The latter two are short-term concerns and focus on security of supply, i.e. it does not matter so much by whom and from where these goods are supplied as long as the supply is reliable. A different rationale applies to high-tech and clean energy goods such as electric vehicles or batteries, where short-term supply is less important than securing domestic production capacities, underpinned by mid- to long-term industrial policy considerations of competitiveness and value chain capture. These characteristics of import dependence are illustrated in Figure 1.

Identifying Relevant Market Failures and Policies to Address Them

From a welfare economics perspective, a competitive market equilibrium without market failures and without government intervention in domestic or international markets leads to efficient trade flows and import volumes. Governments may have other incentives to intervene in international trade flows and supply chains (Juhász and Lane 2024), but if they deploy policies purely on the grounds of removing market inefficiencies, they would have no reason to intervene against high levels of import dependence.

We disentangle these two different sets of motivations by analyzing which market failures might result in too little domestic production or too little diversification, respectively, from a self-interested perspective that aims to maximize national welfare. Market failures that are responsible for too little domestic production include localized technology spillovers or economies of scale and agglomeration effects. Domestic production might also benefit national security in the absence of markets that are able to provide insurance against supply interruptions in the case of a geopolitical conflict. Moreover, as transaction costs can hinder compensating social interest groups that would lose from a clean energy transition, distributional considerations can also provide a rationale for policies that temporarily promote domestic production. Even though the latter consideration is not a market failure in the strict sense, it creates a rationale for policy intervention. Market failures responsible for firms underinvesting in activities that would increase their resilience to supply shocks include coordination failures, information costs, myopic behavior, and the expectation that policy makers will intervene in times of serious crises.

If we assume that import dependence is the manifestation of one or more market failures, policy makers can implement measures to promote domestic production and diversify supply chains for goods that are deemed to be of strategic importance. Policies to promote domestic production include: support for research, development and deployment; trade interventions; and state ownership. Policies to foster diversification and resilience include: establishing strategic reserves/stockpiling; developing substitutes and fostering a circular economy; using tradable or tiered import rate quotas; providing information on supply networks and substitution possibilities; preempting coercion from other countries by building up a credible threat of retaliation; and entering strategic partnership with key supplier countries. The relevant market failures and policies to address them are summarized in Table 1.

Relevance for Policy Making

Most of the identified market failures underlying import dependence cannot be addressed directly, and the choice of policy instruments is often not straightforward. It is hence crucial to not only focus on the effectiveness of a policy to spur domestic production or diversification. Instead, policy makers also need to consider trade-offs with other policy objectives. For example, trade restrictions create artificial barriers that can prevent production from being located where it is most cost-effective. Economic costs are crucial, as economically inefficient approaches can hamper the transition to a clean energy system. Direct trade-offs might also arise between the objectives of achieving more domestic production and of diversifying supply chains, so that policy makers will need to find a way to strike a balance between these objectives.

Policies to address import dependence will in most cases be part of a broader policy mix that combines different policy instruments in a way that also accounts for how they impact on different market failures. For real-world policy design, it will be decisive to focus on a narrow set of import dependencies and on policies that address the most important market failures (Pisani-Ferry, Weder di Mauro, and Zettelmeyer 2024).

It also seems advisable to use a precautionary approach that takes into account potential impacts of ill-designed policy failures. Some policies, such as providing information or stockpiling strategic reserves, will likely have a substantially lower potential for adverse side effects than others, such as trade restrictions.

Policy formulation will also need to account for the broader geopolitical context. For instance, an important policy objective may be to shift economic activity away from geopolitical rivals by either incentivizing increased domestic production or production in third countries. To strategically deprive geopolitical rivals of certain economic opportunities, policy makers might aim to block their competitors' access to technologies that open up a broad range of development prospects (such as microelectronics) or that are of critical military importance (such as nuclear technology).

Our working paper offers a first conceptual step towards better understanding the market failures and broader geopolitical objectives underlying different policies to address import dependence. Subsequent research will be needed to better understand the interplay of different market failures and their implications for an appropriate policy mix.

	Source of market failure	**Policies to address market failures**
Too little domestic production	Localized technology spill-overs Economies of scale and agglomeration externalities Missing insurance markets Transaction costs	Support for research, development and deployment Trade restrictions State ownership
Too little diversification and resilience	Moral hazard and policy makers' lack of commitment Coordination failures Information costs Myopia	Stockpiling Developing substitutes and establishing a circular economy Tradable or tiered import rate quota Facilitating information provision Preempting coercion

Table 1. Summary of market failures that may result in too little domestic production and too little diversification, respectively, and policies to address them.

Michael Jakob, Matthias Kalkuhl, Robert Marschinski, Michael Mehling, and Joschka Wanner (2025), "The Economic Logic of Policies to Address Import Dependence in Clean Energy Goods", CEEPR WP-2025-17, MIT, September 2025. For references cited in this story, full bibliographical information can be found in the Working Paper.

Research.

A Country-Level Study of Exposure to Battery Price Fluctuations through Trade Networks

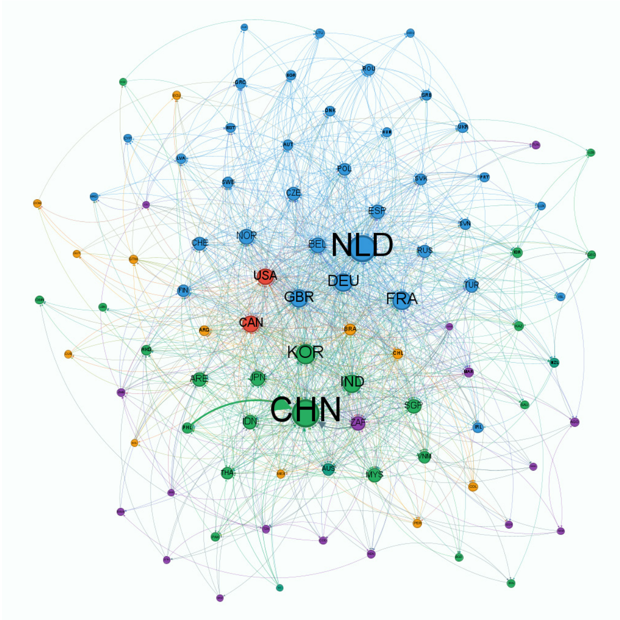
By: Andrea Bastianin, Ilenia Gaia Romani, Luca Rossini, and Marco Zoso

The global transition to clean energy depends heavily on lithium-ion batteries, which power electric vehicles, renewable energy storage, and consumer electronics. Stable battery prices are therefore crucial for making clean technologies competitive with fossil fuels. If battery prices swing unpredictably, the costs of electric vehicles, renewable energy storage, and other green technologies may rise, slowing adoption.

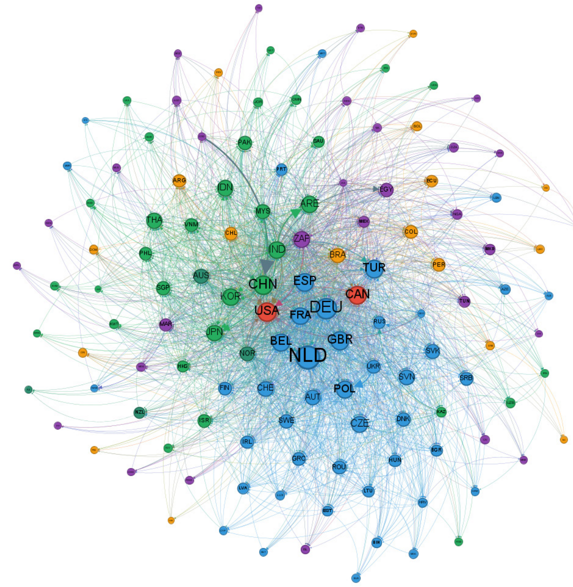
One of the main drivers of instability in lithium-ion battery prices is the complex structure of their supply chain. In particular, the raw materials needed for their production are mined in only a few countries. For example, the Democratic Republic of Congo produces over three-quarters of the world's cobalt, Indonesia dominates nickel production, and China refines the majority of processed battery materials. This concentration means that disruptions — from geopolitical tensions, trade restrictions, or even local unrest — can spread quickly through the supply chain and impact global battery markets.

Our research explores an often-overlooked issue: how a country's position in the global trade network of critical raw materials (such as cobalt, lithium, nickel, and manganese), their processed derivatives, and finished batteries affects its vulnerability to supply chain–driven price swings. By combining trade and price data with advanced network analysis, we shed light on why the risks from battery price volatility are not the same for all countries; instead, they depend on trade network characteristics.

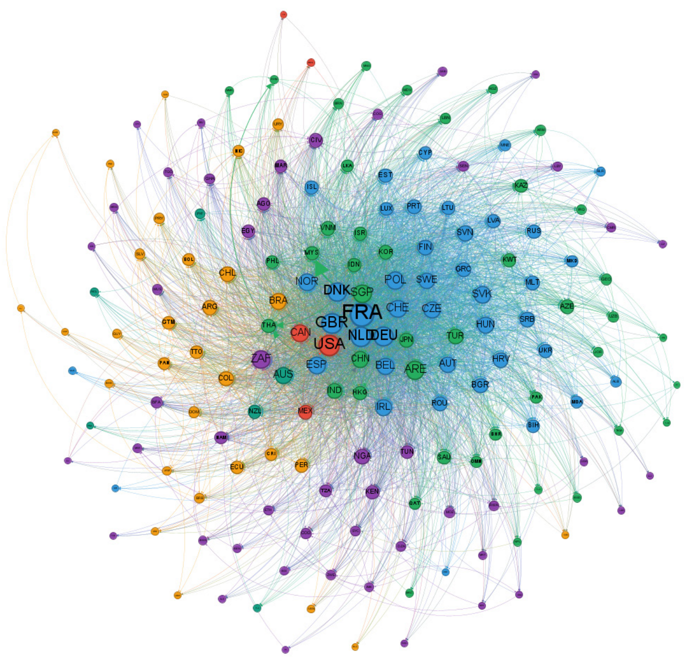
Specifically, we map the supply chain into three layers: raw minerals, processed materials, and finished lithium-ion batteries. Figure 1 shows a graphical representation of these networks for 2022, highlighting the main actors at each stage.



(a) Raw materials



(b) Processed materials



(c) Li-on batteries

Figure 1. Trade networks of raw (a), processed materials (b), and batteries (c), in 2022. Each node represents a country, with node size proportional to the number of importing partners and node color indicating geographical region.

We then regress indicators of these networks on a newly constructed country-level index of exposure to battery price fluctuations.

In theory, it is not clear whether being more connected in these trade networks makes countries safer or more vulnerable. On the one hand, greater connectivity might provide stability, since a country with many partners and a central position could spread risk and benefit from its influence. On the other hand, those same links might amplify exposure, leaving countries more vulnerable to shocks that spread quickly across the network.

We employ statistical models that account for differences across countries and over time to examine how trade network positions affect exposure to battery price swings. Our analysis shows that being central in the trade network or exporting to many partners does not seem to have an impact on vulnerability. Instead, what matters most is imports. Countries that rely on a larger number of import partners for processed materials and finished batteries are actually more vulnerable to price volatility, not less. In other words, the second hypothesis prevails — greater connectivity through imports tends to amplify, rather than mitigate, exposure to battery price shocks.

These findings have important policy implications. First, reducing vulnerability requires strategic import concentration rather than simple diversification. Mineral-dependent countries may reduce their exposure to battery price volatility by lowering the number of origin countries from which they import processed materials and batteries. This runs counter to the conventional diversification logic that more trading partners reduce risk, highlighting instead the asymmetry between exporting and importing positions in the trade network. For mineral-importing economies, resilience lies in building more stable, possibly long-term contractual relationships with fewer suppliers, or in developing domestic midstream and downstream capacities. In addition, fostering research, innovation, and industrial policies that encourage the substitution of scarce or complementary critical minerals with more abundant alternatives could further mitigate vulnerability by reducing the risk of joint supply disruptions. Taken together, such strategies can help ensure that battery prices remain stable enough to support the rapid adoption of clean energy technologies worldwide.




Andrea Bastianin, Ilenia Gaia Romani, Luca Rossini, and Marco Zoso (2025), "A Country-Level Study of Exposure to Battery Price Fluctuations through Trade Networks", CEEPR WP-2025-18, MIT, September 2025.

Research.

An Informational Nudge to Shave Peak Demand

By: Gilbert E. Metcalf

Gilbert E. Metcalf (2025), "An Informational Nudge to Shave Peak Demand", CEEPR WP-2025-13, MIT, July 2025.

In New England, ISO New England (ISO-NE) is responsible for operating wholesale power markets and ensuring adequate capacity to serve load throughout the year. Theory suggests that competitive power markets should incentivize adequate capacity to serve load in all scenarios. In practice, however, a variety of real-world market impediments preclude that theoretic outcome. As a result, RTOs and ISOs have fallen back on other approaches to ensuring adequate capacity, including the introduction of capacity markets.

ISO-NE holds annual capacity auctions to lock in capacity for future years and charges load serving entities (LSEs) for that capacity. Charges to LSEs are based on their share of system load in the single highest peak hour during the summer each year. This creates incentives for LSEs to predict the peak hour and undertake measures to reduce load during that hour. The Concord Municipal Light Plant (CMLP), a small municipally owned utility in Concord, MA, has implemented an alert program to encourage residential consumers to reduce demand during a potential peak alert hour in the months of June through September.

This paper measures whether and how much these informational alerts lower the utility's load during those hours. Using hourly data in the summer months when alerts are sent over the years 2013 to 2024, I estimate that the alerts reduce load demand by 0.714 MW (roughly two percent) during peak alert hours. Depending on ISO-NE's cost of purchasing capacity in a given year, the benefits of a small reduction in load at peak can be substantial for a peak alert program that has almost zero cost.

Capacity costs are non-trivial for CMLP. Its annual payments in 2022 came to over $3.3 million a year. Reducing CMLP's peak can bring about substantial savings. The value of reducing CMLP's coincident peak per kilowatt in 2022, for example, was $8.993. On a megawatt basis, this is $8,993 per month or $107,921 annually. Figure 1 shows the value to the local municipal utility of reducing demand at the system peak by 1 kilowatt in each of the past 8 years. The expected savings have declined over time but are beginning to rise again and are anticipated to rise further, given ISO-NE's projections of rising clearing prices in the forward capacity auction over the next few years.

As noted above, my preferred estimate of the impact of the peak alert program is to reduce the coincident peak by 0.714 MWs. Conditional on a peak alert being called for the hour that CMLP's coincident peak occurs, the value of the program, on average, is 0.714 x $107,921 or $77,056 in 2022. This assumes CMLP correctly identifies the ISO-NE peak hour each year. In actuality, CMLP calls an alert for an hour that turns out to be the ISO-NE peak hour for that year in eleven out of the sixteen years that the alert program has been in effect. The expected value of the peak alert program then is:

$$E(Savings) = \left(\frac{11}{16}\right)(\$77{,}056) = \$52{,}976.$$

Table 1 reports the yearly expected savings to CMLP from its peak alert program. Expected savings have declined from just under $130,000 to a little more than $37,000 in year ending May 2025. While the auction clearing price for capacity in the forward capacity market has trended downward until CCP 2024 and been flat for the following three years, it jumped 38 percent in the auction for CCP 2028, reflecting higher costs of new potential entry due to inflation (and higher expected costs in future years).

The private benefits to CMLP from this program are substantial but come at the cost of shifting capacity costs on to other LSEs in ISO-NE. There are social benefits from the program, however. But I find that those social benefits are swamped by the private benefits. These private benefits arise, however, by shifting capacity costs onto other utilities and load customers in the region. This, of course, suggests an unproductive competition where ISO-NE LSE's implement similar programs to reduce peak demand during the hour that ISO-NE is predicted to hit its annual peak. A focus on reducing this singular hour of demand is unlikely to reduce overall peak demand and the need to have capacity available for high-demand summer hours. Such a competition would suggest that it would be fruitful for ISO-NE to consider alternative ways to allocate capacity charges across its customers that don't focus on a single peak hour of the year to allocate annual charges.

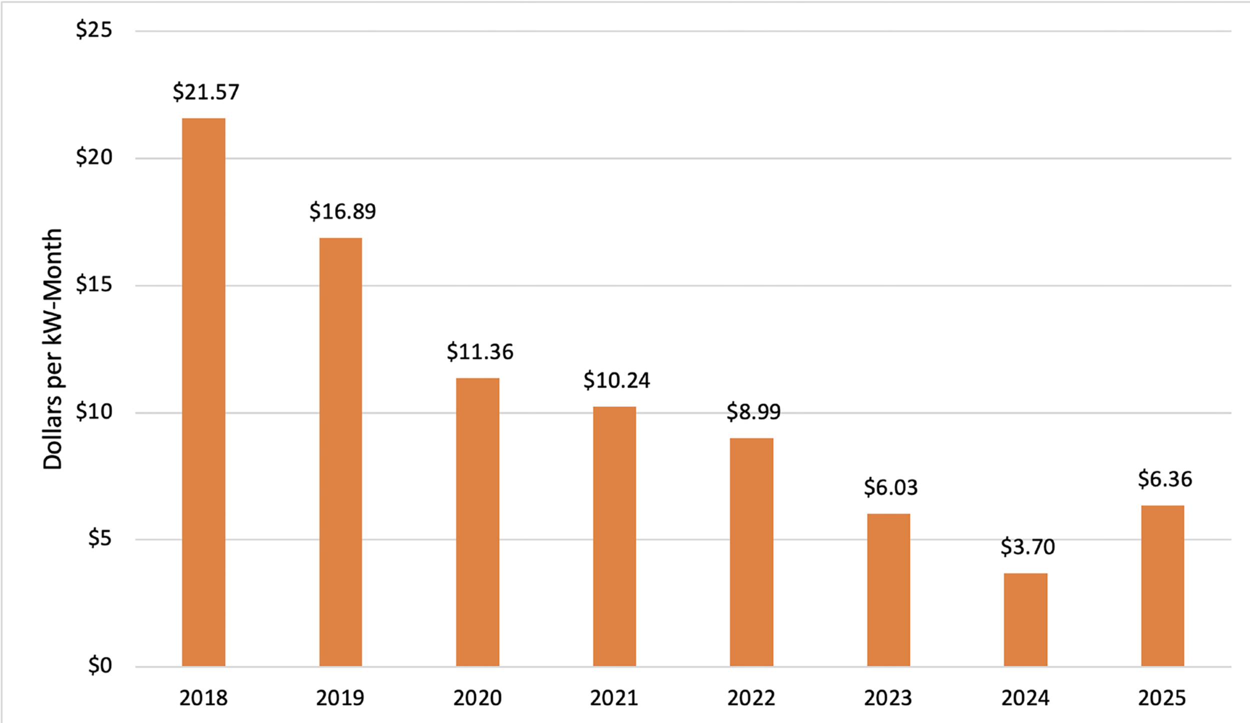


Figure 1. Value of reducing peak demand at system peak by 1 kilowatt.

Table 1. Expected Private Value of Peak Alert Program

CCP	Marginal Peak Cost (kW-Mo)	Annual per MW	Value of Peak Alert	E (Value of Peak Alert)
2018	$21.57	$258,890	$184,847	$127,082
2019	$16.89	$202,628	$144,676	$99,465
2020	$11.36	$136,279	$97,303	$66,896
2021	$10.24	$122,928	$87,771	$60,342
2022	$8.99	$107,921	$77,056	$52,976
2023	$6.03	$72,366	$51,669	$35,522
2024	$3.70	$44,340	$31,659	$21,766
2025	$6.36	$76,356	$54,518	$37,481

Source: Author's Calculations. Coincident peak occurs during peak alert hour with probability 11/16.

Research.

Is Fusion Too Late? How Investors Value Its Role in a Decarbonized Europe

By: Sophia A. E. Spitzer, Katja Pelzer, Anton Bauer, and Maximilian J. Blaschke

Fusion power has long been hailed as a transformative technology capable of delivering virtually limitless, carbon-free electricity (Armstrong et al. 2024; Takeda et al. 2023; Schwartz et al. 2023; Nicholas et al. 2021). Its expected attributes — clean baseload generation, high energy density, and siting flexibility — make it attractive to the ambitious global decarbonization agenda. Yet repeated delays and the so-called "fusion constant," the perception that fusion is always thirty years away (Takeda and Pearson 2019; Ball 2021), have made its commercialization success and timing highly uncertain.

This study evaluates fusion's prospective role in a future energy system through a two-stage approach. First, we implement fusion plants in PyPSA-Eur, an open-source, sector-coupled model of the European energy system with three-hour temporal resolution and a 39-node spatial network (Brown et al. 2024; Victoria et al. 2022; Victoria et al. 2020; Neumann et al. 2023). The model simulates a cost-optimal capacity mix from 2030 to 2100 under varying assumptions about fusion's commercialization date (2035 vs. 2050), overnight capital costs, and diffusion constraints. Second, a probabilistic evaluation framework translates modeled system cost savings into an Anticipated Commercialization Probability (ACP), a measure of the likelihood investors implicitly assign to fusion's success based on observed investment flows.

The modeling reveals three characteristic phases of fusion deployment (see Figure 1).

- Diffusion phase (2035–2050):
  Fusion grows in parallel with increasing electricity demand during the energy transition.

- Replacement phase (2050–2070):
  A second wave of fusion growth coincides with the end-of-life replacement of renewables installed during the pre-2040 high-growth phase. This shift is primarily driven by the phase-out of wind capacity, which has become less competitive due to its comparatively lower learning rates compared to solar PV.

- Saturation phase (after 2070):
  Fusion's relative advantage diminishes as cost reductions slow. The technology reaches a saturation point, where fusion's learning rate unlocks new energy generation potential only under favorable cost trajectories.

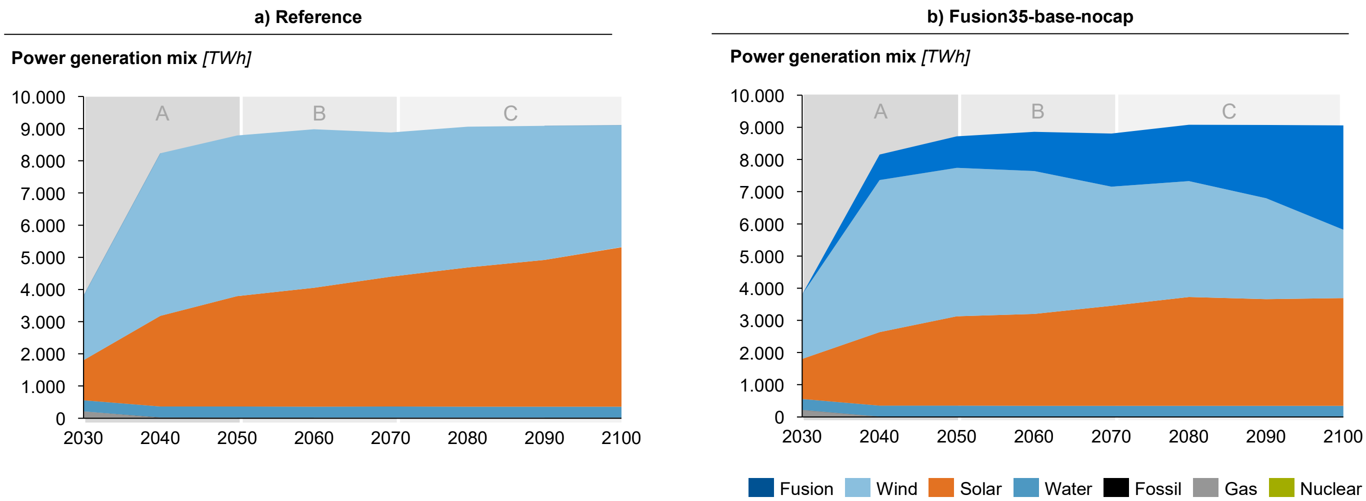


Figure 1. Evolution of Europe's energy generation mix with and without fusion.
Note: The reference scenario follows PyPSA-Eur assumptions extrapolated to 2100.

Under low-cost assumptions (< 4,000 USD2020/kWel), fusion could supply up to 30 % of European electricity by 2100 and reduce cumulative system costs by nearly EUR 2 trillion (discounted to 2020). Crucially, these savings arise less from cheap generation per se than from avoided storage and renewable capacity: As a baseload source, each gigawatt of fusion can displace several gigawatts of variable renewables, cutting storage needs, grid expansion, and balancing services. Even with only a 10 % capacity share, fusion's high utilization enables it to deliver roughly one-third of total generation while reducing long-distance transmission needs by up to 20 % and hydrogen transport by 45 %.

Capital costs emerge as the single strongest driver of fusion's market share and system value. Low overnight capital costs enable fusion to scale to double-digit capacity shares even if commercialization is delayed, while high costs render the technology marginal regardless of timing or build-out limits. Timing remains critical, particularly for the economic value. A delay from 2035 to 2050 reduces the discounted system savings by more than half, even when long-run generation shares stay sizable.

By comparing modeled system benefits to cumulative European public and private investments (EUR 42 billion by 2035; EUR 76 billion by 2050), we further infer anticipated success probabilities below 20 % for a 2035 market entry. This gap between large theoretical value and modest investment reflects a high-risk/high-reward paradox typical of breakthrough technologies: uncertainty suppresses funding, which in turn limits the likelihood of success.

Policy implications are twofold. First, accelerating cost reductions — e.g., through modular reactor designs, standardized licensing, or milestone-based incentives — is critical for timely deployment. Second, current investment levels appear inconsistent with the societal value that fusion could provide. Without stronger public support or new financing mechanisms, Europe risks underinvesting in a technology that could lower long-term energy costs and enhance energy sovereignty.

Sophia A. E. Spitzer, Katja Pelzer, Anton Bauer, and Maximilian J. Blaschke (2025), "Is Fusion Too Late? How Investors Value Its Role in a Decarbonized Europe", CEEPR WP-2025-20, MIT, October 2025. For references cited in this story, full bibliographical information can be found in the Working Paper.

Research.

Flexible Data Centers and the Grid: Lower Costs, Higher Emissions?

Christopher R. Knittel, Juan Ramon L. Senga, and Shen Wang (2025), "Flexible Data Centers and the Grid: Lower Costs, Higher Emissions?", CEEPR WP-2025-14, MIT, July 2025.

By: Christopher R. Knittel, Juan Ramon L. Senga, and Shen Wang

Data centers are among the fastest-growing electricity consumers, with their energy demand projected to increase over the coming years. In the U.S., that projection is an increase of 7-12% by 2030. This surge is driven by advances in artificial intelligence and the prevalence of cloud computing, which poses challenges for grid reliability and decarbonization efforts. The additional load could put stress on the grid and increase the usage of existing thermal power plants, which may increase carbon emissions. For example, in PJM, the forecasted increase of 32 GW (20% increase) in summer peak load mostly comes from data centers and is equivalent to adding another mid-sized state's demand to the system. However, opportunities exist to operate data centers more flexibly as demand response resources, potentially mitigating large load impacts. One of these strategies takes advantage of a latent demand response resource we call *data center temporal flexibility*—the ability of data centers to change its load profile by shifting workload across time.

However, it is unclear how this flexibility affects power system planning and operations. The ability to shift demand could significantly impact investment decisions, plant retirements, and operational strategies. This may alter the trajectory of capacity expansion and reliability planning for regional operators. Second, the potential grid benefits that flexible data centers bring are not yet understood for different levels of flexibility.

While some portion of the data center load is flexible, the degree to which it can be shifted is constrained over time. Tasks cannot be postponed indefinitely, and certain tasks may not be shifted at all. Thus, understanding the combinations of flexibility levels (in terms of duration and shifting potential) that can lower cost and emissions is critical. Furthermore, the impact of data center flexibility on different regions may vary depending on the characteristics of the regional grid.

We use the GenX capacity expansion model (CEM) to answer these questions. We model combinations of scenarios that vary the *shifting horizon*—the time window in which loads can be shifted—from 1 to 24 hours, and the share of *flexible workload*—the fraction of total shiftable demand—from 1% to 100%.

Our findings show that data center temporal flexibility can significantly change a power system's operations and generation mix. Higher flexibility levels enable net load shifting from peak to off-peak hours, flattening the net load profile. This reduces reliance on peaker or ramping plants and promotes more stable operation of base load generators. When renewables are sufficiently cost-competitive—as in Texas, where wind and solar are projected to supply 54% of generation—high levels of data center flexibility results in up to 40% lower CO_2 emissions and accelerate retirements of coal and nuclear plants. This reverses in the Mid-Atlantic and WECC: renewable penetration is lower, coal units that survive retirements can run more uniformly, and system-wide emissions rise by as much as 3%, even though costs still fall.

We confirm this cost sensitivity in a counterfactual experiment that raises renewable investment and fixed O&M costs in Texas to 1.3 times baseline values. Renewable share collapses to 21%, coal plants remain on the system, and the emissions advantage of flexibility disappears—demonstrating that data center load shifting substitutes for baseload when clean energy is economical.

Across all regions and price scenarios, however, temporal flexibility always lowers total system costs—by up to 5% in Texas—while steering new investment toward renewables (wind in Texas, solar in WECC and the Mid-Atlantic) and crowding out battery storage. Flexible data center operations thus emerge as a robust, low-cost reliability resource whose climate value hinges on the underlying economics of clean power.

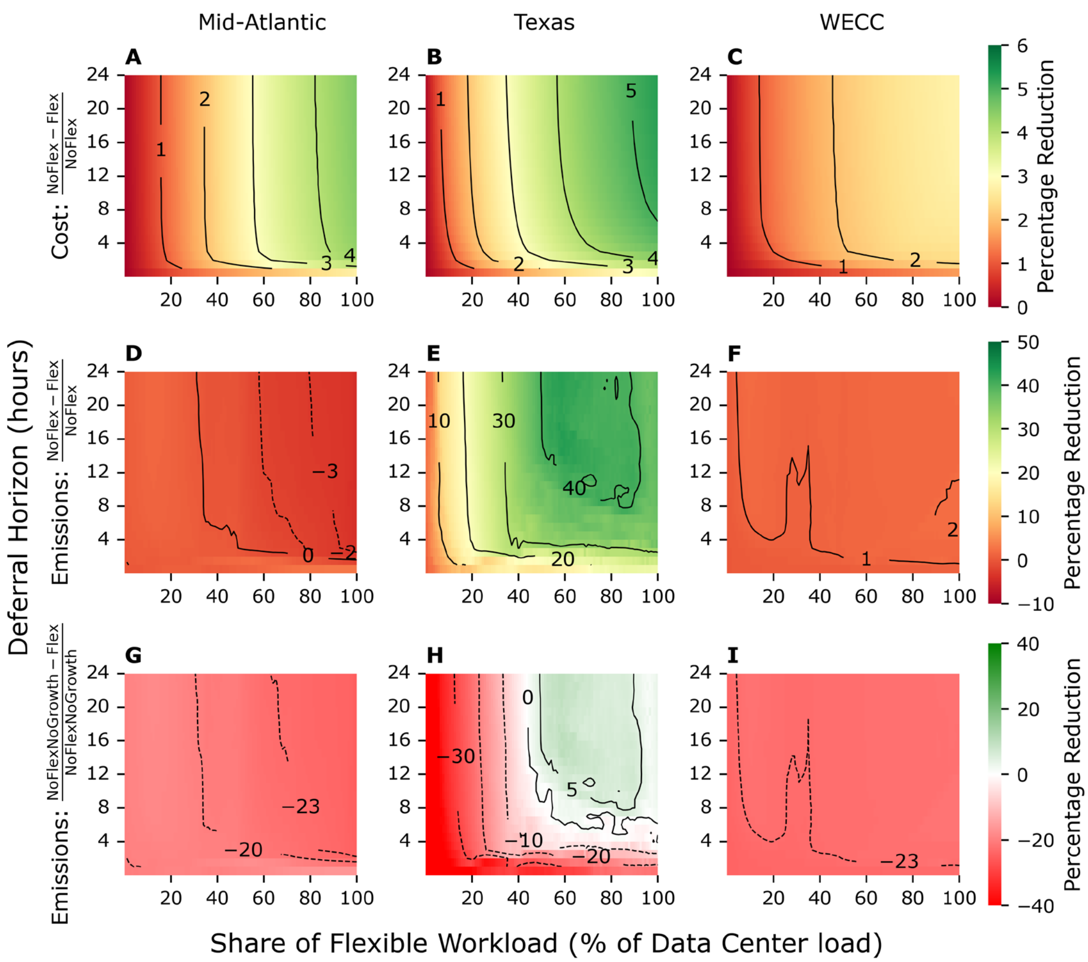


Figure 1. Cost and Emissions Reduction.

Top row (A, B, C): Heatmaps show the percentage reduction in total system cost from introducing flexible data centers, relative to a system without flexibility, across combinations of shifting horizon and share of flexible workload. Middle row (D, E, F): Heatmaps of percentage reduction in system CO_2 emissions under the same flexibility configurations, relative to the no flexibility baseline. Bottom row (G, H, I): Heatmaps of percentage reduction of system CO_2 emissions of a reference system with no data center flexibility and no data center load growth. Green (red) color indicates a decrease (increase) in CO_2 emissions relative to the no growth scenario. The "no growth" baseline assumes data center load in 2030 maintains the same share of total system load as in 2022. *Note: Color scales vary across rows.*

Research.

Birds of a Feather Pollute Together: Endogenous Green Preferences and Opinion Dynamics in the Low-Carbon Transition

By: Demis Legrenzi, Emanuele Ciola, Davide Bazzana, Massimiliano C. P. Rizzati, Enrico M. Turco and Sergio Vergalli

The transition towards greener and more environmentally sustainable business models has gained significant traction among companies in recent decades. Green accounting and communication of firms' environmental values have emerged as critical competitive strategies in the consumer goods market. At the same time, increased environmental awareness, effective marketing campaigns, and improved education on environmental issues have gradually influenced consumers to pay greater attention to the products they purchase and the social implications of their choices. In this sense, when a substantial portion of consumers is committed to sustainability, a new consumption paradigm may emerge, encouraging firms to adopt greener practices. However, the extent to which these social dynamics affect green investments (e.g., emissions abatement) remains a topic of ongoing debate.

This work extends the Multi-Agent model for Transition Risks (MATRIX – Bazzana et al., 2024) calibrated on the Euro Area to investigate how endogenous green preferences for consumption goods interact with firms' investment decisions in reducing aggregate emissions. Specifically, we explore whether the uncoordinated actions of consumers and firms can (endogenously) reinforce each other, fostering a virtuous cycle toward lower carbon emissions. We assume that a household's preferences are influenced by its peers and by evolving individual attitudes. Moreover, since green consumption preferences represent just one side of the spectrum, we allow households to develop anti-environmental consumption preferences. Thus, we consider the possibility of lock-in effects that may emerge during this process and avoid the transition to a low-carbon economy. Lastly, we complete our analysis by examining the potential interaction of such behavior with standard climate policy tools, such as carbon taxation.

We find that consumers can prompt large-scale abatement investments, leading to a massive reduction in the emission intensity of firms even without public intervention guiding the effort with climate policy. By redirecting resources towards environment-friendly firms they reward green investments. The environmental benefits are greater when households are more reactive, changing their preferences frequently or quickly.

Nevertheless, while this process can complement carbon taxation in the short term, it becomes conflicting once emissions achieve the target level. At that point, consumers start suffering a loss of income due to

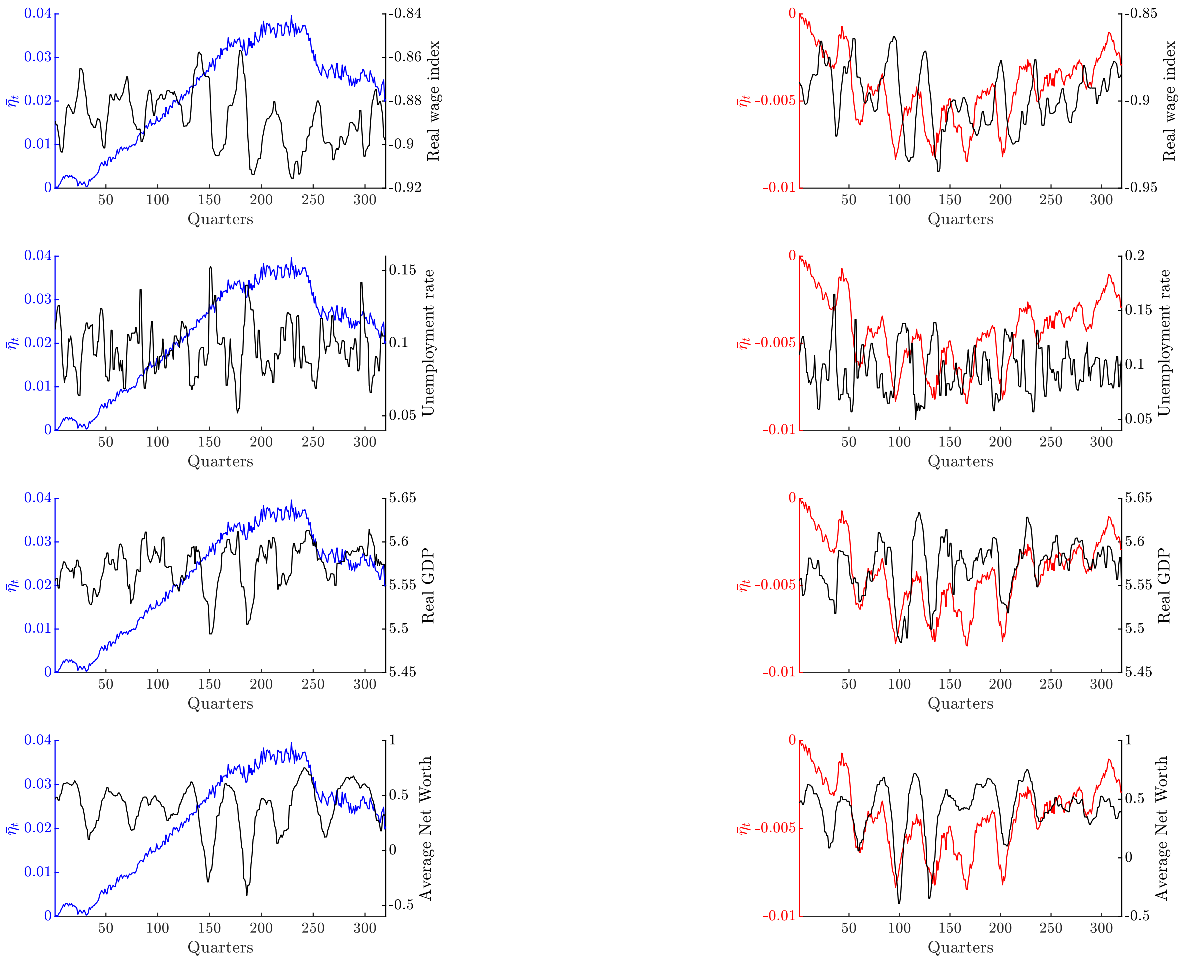


Figure 1. Plots of macro-variables and average green preferences for a randomly sampled simulation.
The GP scenario (personal green preferences) is shown on the left, in blue, while the SN scenario (introduction of social dynamics) is on the right, in red. The first quarter corresponds to 2020Q1.

carbon taxation without benefiting from a supplementary reduction in emissions, thus making their preferences less green (Bosetti et al., 2025).

Indeed, the distributional consequences of climate policies are proving to be a major obstacle (the so called "green backlash'") to public support for mitigation, with relevant implications on a political level (Egli et al., 2022; Voeten, 2025). However, parallel compensation schemes may prevent households from moving towards anti-environmental preferences or factions (Colantone et al., 2024). Therefore, managing such a variation in households' attitudes while keeping a (relatively) high carbon tax rate may become politically unfeasible, thus constraining policy-makers decisions and possibly reverting their past choices.

These dynamics disappear when an imitative (i.e., a social) component is introduced in the model. Indeed, accounting for peers' preferences reduces the perceived reduction of firms' emissions intensities by consumers, and only coordinated and economy-wide changes would generate sufficient stimuli for households to modify their behavior. According to our sensitivity analysis, this happens even when imitation has a significantly lower weight in preference formation compared to the internal component, and the size of a household's neighborhood seems to have a limited impact on this effect.

Figure 1 shows how green preferences behave over time along with the main macro-series (i.e., the unemployment rate, average net worth, real GDP, wage index growth rates). Without peer imitation (left side panels, blue line), the dynamics of green preferences are disconnected from the main macro-series, at least until carbon abatement objectives are reached in the long term. In this case green preferences are more dependent on observed abatement progress. However, when peer effects are active (right side panels, red line), green preferences mirror the macro-series, implying the dominance of income effects on green consumption choices.

Concerning the interaction of green preferences with climate policy, internal green preferences make the government's task easier and faster in the short term by reducing the need for carbon taxation. Then again, these advantages vanish once social dynamics are included.

Thus, the government may be able to exploit green consumers to attain its emission reduction objectives. However, encouraging firms to jump-start abatement investments is necessary to allow consumers to find the green path. Some form of short-term financial assistance (such as subsidies or guarantees) to private investments in carbon capture and storage or strengthening the emission permits trading system are just a few options for the government to provide the momentum needed. Figure 2 highlights the difference in carbon tax level between the cases without (left panels) and with peer effects (right panels). When peer imitation is active, the median carbon tax rate fixed by the government to achieve its environmental goals is consistently higher than in the case where it is inactive, especially when the carbon tax is more reactive (i.e., sharper adjustments in the carbon tax rate – middle and bottom panels).

To summarize, our results support the capability of pro-environmental preferences to facilitate the green transition. However, when firms display a limited initial commitment to abate, the diffusion process can be slowed down or even reversed if consumers give importance (no matter how little) to the green preferences exhibited by their peers. The positive signals from a few virtuous firms can drown among the contrasting opinions of one's network. Thus, we highlight the importance of massive, coordinated abatement efforts in the short term if policymakers intend to exploit pro-environmental preferences to their advantage. Slow and uncertain signals to consumers may be counterproductive.

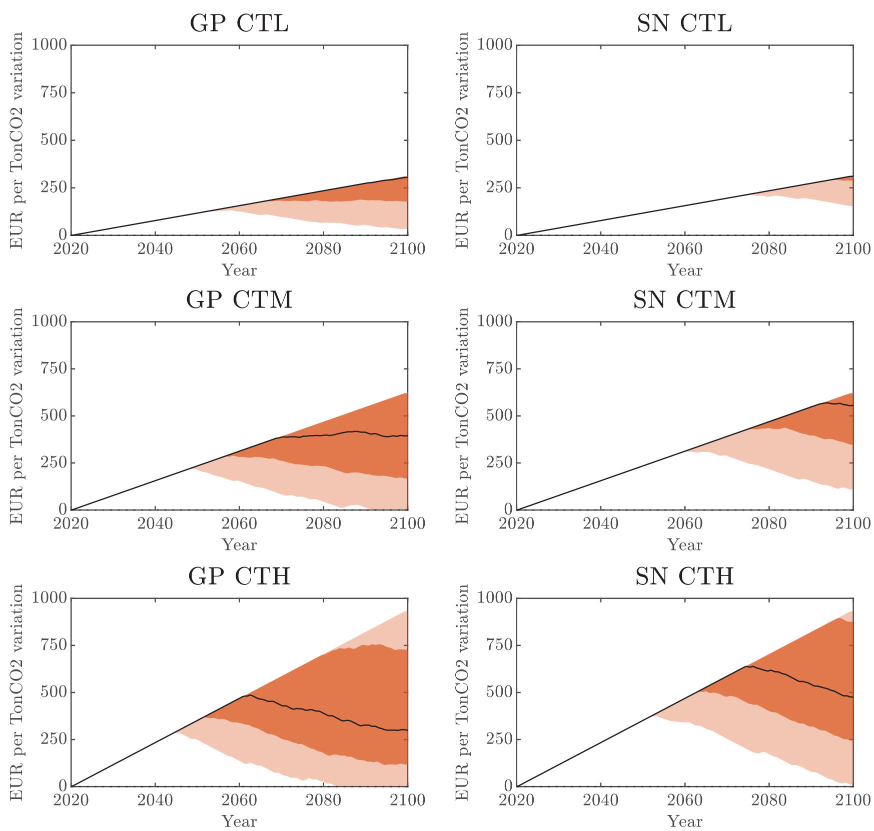
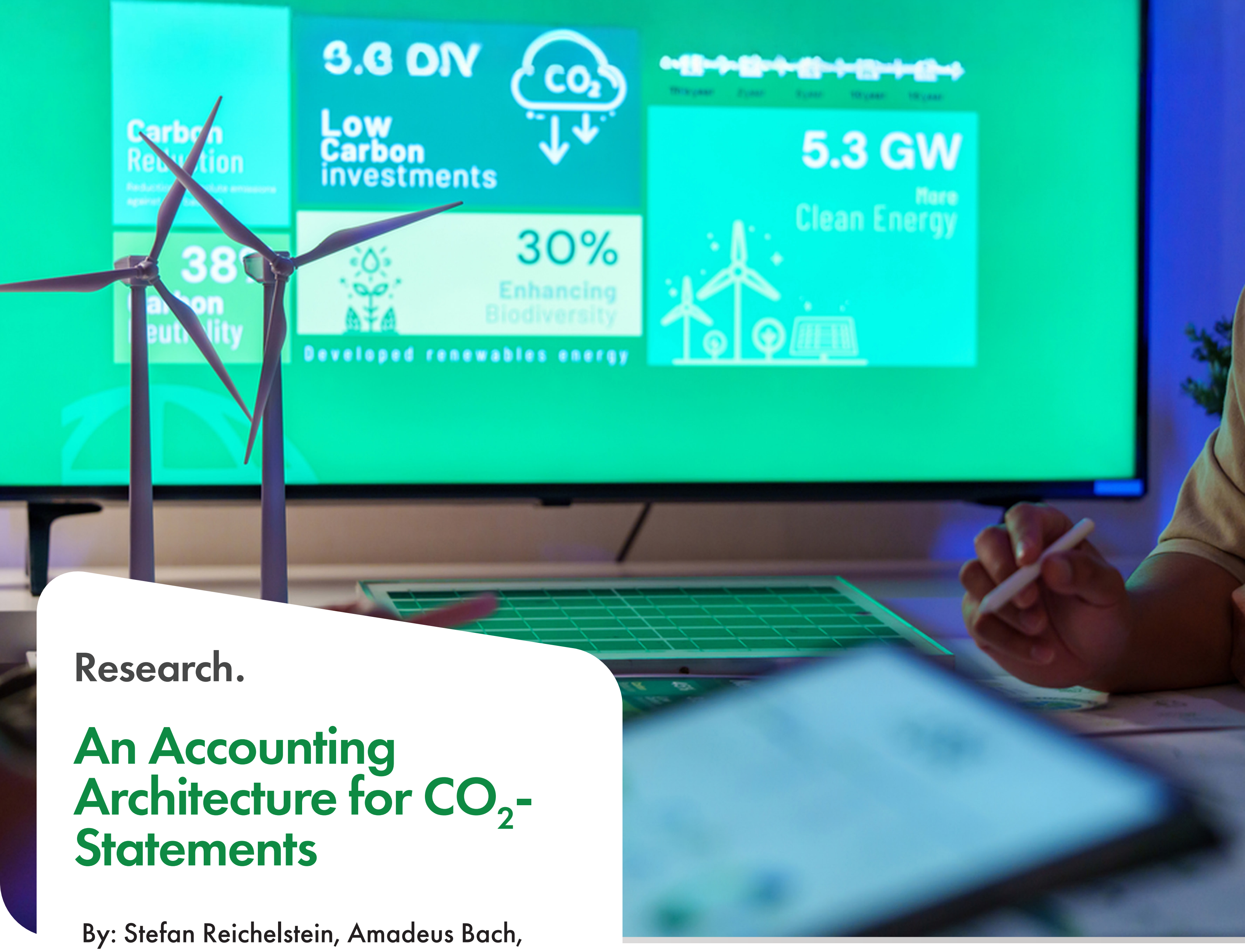


Figure 2. Sensitivity analysis for increasing carbon tax adjustment speed (low to high going down the figure).
Adjustment speed is lowest for the top figures and highest for the bottom figures. The figures on the left show the results for personal green preferences, while the figures on the right include the social component.

Demis Legrenzi, Emanuele Ciola, Davide Bazzana, Massimiliano C. P. Rizzati, Enrico M. Turco and Sergio Vergalli (2025), "Birds of a Feather Pollute Together: Endogenous Green Preferences and Opinion Dynamics in the Low-Carbon Transition", CEEPR WP-2025-15, MIT, August 2025.



Research.

An Accounting Architecture for CO_2-Statements

By: Stefan Reichelstein, Amadeus Bach, Christoph Ernst, and Gunther Glenk

The Greenhouse Gas (GHG) Protocol is the globally recognized reference framework for reporting corporate carbon emissions. Classifying different emission inventories into direct and indirect, as well as upstream and downstream emissions, the GHG Protocol takes a comprehensive life-cycle approach to assessing a company's overall Scope 1-3 emissions (GHG Protocol, 2004). While this framework has been adopted by organizations worldwide and included in disclosure mandates, multiple stakeholder groups have been clamoring for more comprehensive and more reliable information about the carbon footprint of corporations and their sales products (Bjørn et al., 2022; Klaaßen and Stoll, 2021; Fankhauser et al., 2022). In response, the GHG Protocol has recently launched a comprehensive revision of its guidance documents, scheduled for completion by 2027.

This perspective article argues that financial accounting offers a practical template for carbon accounting systems that are consistent with existing emissions reporting frameworks (Reichelstein, 2024). Similar to financial statements, the proposed system for carbon accounting results in CO_2-statements, comprising a CO_2-balance sheet and periodic statements showing the emissions an entity and its supplier network have contributed to the atmosphere in the current period. We argue that CO_2-statements provide analysts with a comprehensive and temporally consistent assessment of an entity's Scope 1, 2, and upstream Scope 3 emissions. The CO_2-balance sheet records stock variables that effectively summarize an entity's past emissions performance and any improvements thereof. In contrast, the net CO_2-contribution metric provides a measure of an entity's periodic corporate carbon footprint. All accounting metrics emerge from the same ledger based on a transactional system of double-entry bookkeeping, with the unit of measurement being one ton of CO_2 (see Figure 1).

Several multinational companies have recently adopted internal product carbon accounting systems to determine the so-called cradle-to-gate product carbon footprints (PCFs) of their sales products. Such footprint measures seek to capture the total direct carbon emissions that have been incurred at the different stages of production in a supply network. Earlier studies have pointed to both efficiency gains and

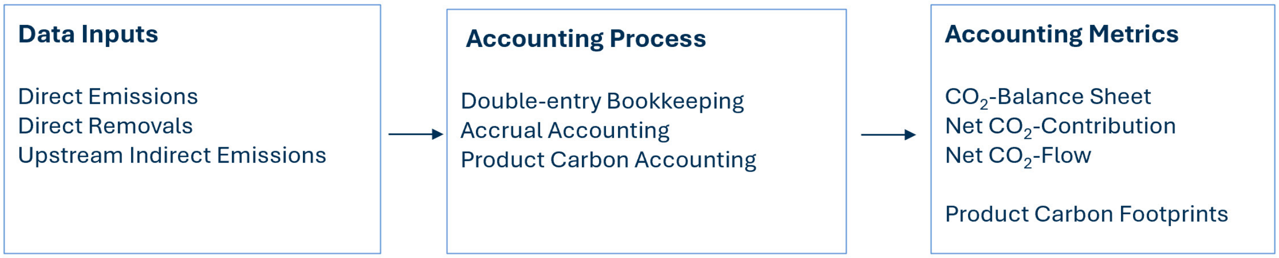


Figure 1. Illustration of corporate carbon accounting. This figure illustrates how the accounting process converts data inputs to accounting metrics.

reliability advantages if cradle-to-gate PCFs are assessed in a sequential and decentralized manner (Kaplan and Ramanna 2021; Kaplan et al. 2023). Accordingly, each firm in a supply network operates its own product carbon accounting system in order to determine the PCFs of its sales products and services on the basis of primary data for the PCFs of inputs received from its Tier 1 suppliers as well as its own direct (Scope 1) emissions.

In accordance with the GHG Protocol's guidance to report an entity's emissions on a life-cycle basis, cradle-to-gate PCFs can be supplemented with estimates of the emissions to be incurred in the use phase of a product. For mass-produced consumer goods, like automobiles, car manufacturers will be able to draw on precise statistical information regarding average product usage and the emission factors associated with usage in different locations. The resulting cradle-to-grave PCFs then combine assessments for the Scope 1, 2, and upstream Scope 3 emissions that have been incurred thus far with forecasts of the downstream Scope 3 emissions expected to materialize during the product's use phase, thereby enabling cradle-to-grave life cycle assessments.

Reliable PCF figures are increasingly demanded not only by consumers but also by corporate customers seeking to decarbonize their supply chains. Even more urgent, standardized PCF calculations become indispensable in jurisdictions where subsidies and tax breaks for "green" technologies are tied to the assessed carbon footprint of a product. In a similar vein, the Carbon Border Adjustment Mechanism to be implemented by the European Union in 2026 requires an assessment of the carbon dioxide emissions embodied in goods delivered to the gates of the European Union.

The cradle-to-gate PCFs of goods and services sold in the current time period become a key building block of the CO_2-contribution metric (see Figure 2). Just as Cost of Goods Sold is a key component of the measure of financial income, Carbon Emissions in Goods Sold conveys the total emissions embodied in goods and services sold in the current period. Certain expense items not closely related to the production process, such as the emissions associated with business travel conducted in the current period, can be added as separate line items to the CO_2-contribution. Direct carbon removals undertaken by a company, or a contractor acting on its behalf, are a source of "revenue." We interpret the bottom-line net CO_2-contribution as the entity's current corporate carbon footprint, as it conveys the net tonnage of carbon dioxide an entity's operations have contributed to the atmosphere in the current accounting period.

$PCF_1 \cdot s_1$	=	CO_2 in Current Sales of Product *1*
$PCF_2 \cdot s_2$	=	CO_2 in Current Sales of Product *2*
.	=	.
.	=	.
.	=	.
$PCF_n \cdot s_n$	=	CO_2 in Current Sales of Product *n*
$\sum PCF_i \cdot s_i$	=	**Carbon Emissions in Goods Sold (CEGS)**
Y	=	General & Administrative Emissions
Less		
X	=	Current Direct CO_2 Removals
$\sum PCF_i \cdot s_i + Y - X$	=	**Net CO_2-Contribution**

Figure 2. Net CO_2-Contribution.
This figure displays CO_2-contribution statement.

The CO_2-balance sheet carries stock variables that are updated from one accounting period to the next (see Figure 3). The left-hand side of this balance sheet records the emissions embodied in the entity's operating assets. These emissions have arrived at the entity's gates, or have been incurred within its gates, but have yet to be recognized as part of the current CO_2-contribution. The liability side of this balance sheet records the accumulated emissions embodied in goods and services received from the entity's suppliers as well as the entity's cumulative direct (Scope 1) emissions, less any accumulated direct removals. Each period's net CO_2-contribution is reconciled with the balance sheet through an account that carries the entity's accumulated past net CO_2-contributions. This feature is again in direct analogy to financial balance sheets, where owners' equity records an entity's past retained earnings.

CO_2 in Assets			CO_2 Liabilities & Legacy
Buildings	BLD_t	ETI_t	Indirect CO_2 Emissions Transferred In
Machinery & Equipment	$M\&E_t$	DE_t	Direct CO_2 Emissions
Materials	MAT_t	(DR_t)	Direct CO_2 Removals
Work-in-Process	WIP_t	LEG_t	Legacy CO_2 Emissions
Finished Goods	FG_t		

Figure 3. CO_2-balance sheet. This figure illustrates an opening CO_2-balance sheet.

The calculation of a company's net CO_2-flow, the third module of CO_2-statements, does not require product carbon accounting (see Figure 4). This metric only includes the "raw" flows corresponding to a company's current direct emissions, net of current direct removals, plus the Scope 2 and upstream Scope 3 emissions associated with all incoming production inputs. As such, it comprises the emissions companies seek to report today under the GHG Protocol. However, in order for the incoming indirect emissions to be assessed on the basis of primary data about emissions actually incurred, the upstream suppliers have to maintain their own in-house product carbon accounting. If no company in a supply network were to calculate its own PCFs, all parties would need to estimate their indirect emissions (Scope 2 and upstream 3) on the basis of secondary data reflecting recent industry averages. This would result in a major duplication of estimation efforts and severely limit a company's incentives to reduce its direct and indirect emissions.

The main focus of this paper is on general principles for structuring CO_2-statements, rather than the specific accounting rules that ought to apply in their preparation. The central principle we advocate for is to separate stock from flow variables by means of balance sheets and periodic net contribution statements. Various organizations have in recent years proposed detailed carbon accounting rules. The architecture of the CO_2-statements described here is sufficiently flexible so as to be compatible with any of these rules or some combination thereof. This flexibility pertains in particular to issues of product and entity boundaries as well as alternative rules for allocating pools of overhead emissions. In the absence of mandated carbon accounting rules, adopters of the CO_2-statement approach can disclose separately the specific rules that have been followed in preparing their statements.

Q	=	Current Direct CO_2 Emissions
Z	=	Indirect CO_2 Emissions Transferred In
Less		
X	=	Current Direct CO_2 Removals
$Q + Z - X$	=	**Net CO_2-Flow**

Figure 4. Net CO_2-Flow. This figure shows the statement of net CO_2-flows.

The CO_2-statements described here are in particular compatible with existing frameworks, such as the GHG Protocol or ISO 14064, and disclosure mandates, such as IFRS S2 and the EU's Corporate Sustainability Reporting Directive. The many parallels between financial statements and CO_2-statements suggest that their adoption is neither overly complex nor costly. Recent software innovations show that existing financial systems can readily be expanded to run a ledger of carbon accounts. Further, the underlying structure of double-entry bookkeeping and the relations that link the different components of CO_2-statements should facilitate the task of auditors in providing reasonable assurance that the statements were prepared in accordance with specific carbon accounting rules.

Stefan Reichelstein, Amadeus Bach, Christoph Ernst, and Gunther Glenk (2025), "An Accounting Architecture for CO_2-Statements", CEEPR WP-2025-16, MIT, August 2025. For references cited in this story, full bibliographical information can be found in the Working Paper.

Policy Support for Electrolytic Hydrogen: Impact of Alternative Carbon Accounting Rules

By: Gunther Glenk, Philip Holler, and Stefan Reichelstein

Governments around the world have recently launched support policies for electrolytic and other low-carbon hydrogen production technologies. These policies aim to accelerate the transition to a decarbonized economy, particularly in hard-to-abate sectors such as steel, chemicals, and heavy transportation. Since the abatement potential of electrolytic hydrogen hinges on the emissions embodied in the electricity converted via Power-to-Gas (PtG) processes, governments in the United States (US), the European Union, and other regions have tied the level of policy support to the carbon intensity of the hydrogen produced. Yet, it remains a topic of intense debate how to assess this carbon intensity and thereby determine the level of support.

This paper examines the impact of alternative accounting rules for assessing the carbon intensity of electrolytic hydrogen and thus the level of policy support for PtG systems. In the debate on this topic, the common belief is that more stringent rules incentivize electrolytic hydrogen production during periods of abundant renewable energy and thus result in lower emissions than hydrogen production from natural gas. Yet, more stringent rules might also starve PtG systems as long as abundant renewable energy remains infrequent, thereby limiting incentives for initial investments. Our analysis shows how alternative rules shape the trade-off between the profitability of PtG systems and the average carbon intensity of the hydrogen produced over the life cycle of these systems.

In alignment with Europe, US regulators during the Biden administration have recently announced plans to base the assessment on multiple pillars that increase in stringency over time. Accordingly, any renewable electricity that investors seek to credit to the produced hydrogen is to be deliverable to PtG plants and incremental to the existing renewable energy supply in the market. For hydrogen produced before 2030, the temporal matching of electricity generation and hydrogen production is to be assessed on an annual basis, as is the carbon intensity of the produced hydrogen. For hydrogen produced thereafter, the electricity matching is switched to an hourly basis. Investors can further choose to assess the carbon intensity of hydrogen on either an annual basis or an hourly basis, provided that the corresponding annual average does not exceed a certain threshold. As of this writing, the US Congress has voted for a significant reduction in the duration of the policy support for hydrogen and other clean energy technologies. In particular, the policy support for hydrogen is now set to be available for investment projects, the construction of which begins before January 1, 2028. The envisioned pillars for assessing the carbon intensity of the hydrogen produced, however, appear to have remained unchanged.

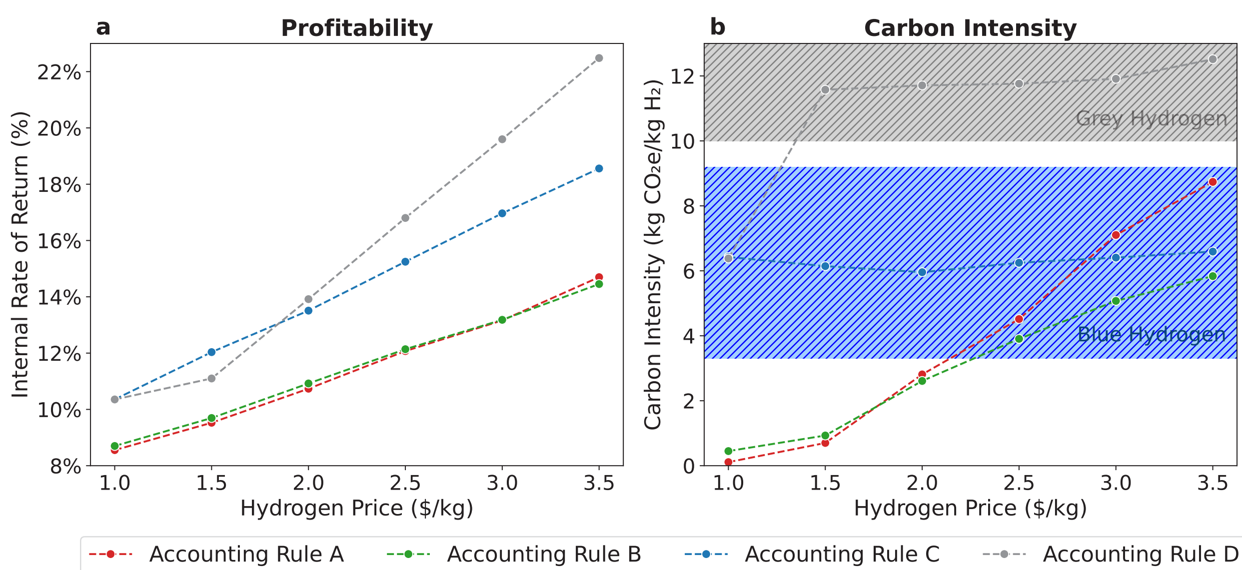


Figure 2. Life-cycle performance under different carbon accounting rules.
This figure shows the impact of accounting rules A (hourly tax credits), B (annual tax credits), C (incremental renewable energy) and D (non-incremental renewable energy) on (a) the profitability of PtG systems, and (b) the life-cycle average carbon intensity of hydrogen, given hydrogen prices between \$1.0/kg and \$3.5/kg. The dots show our point estimates at specific hydrogen prices, while the dashed lines interpolate between them for illustration.

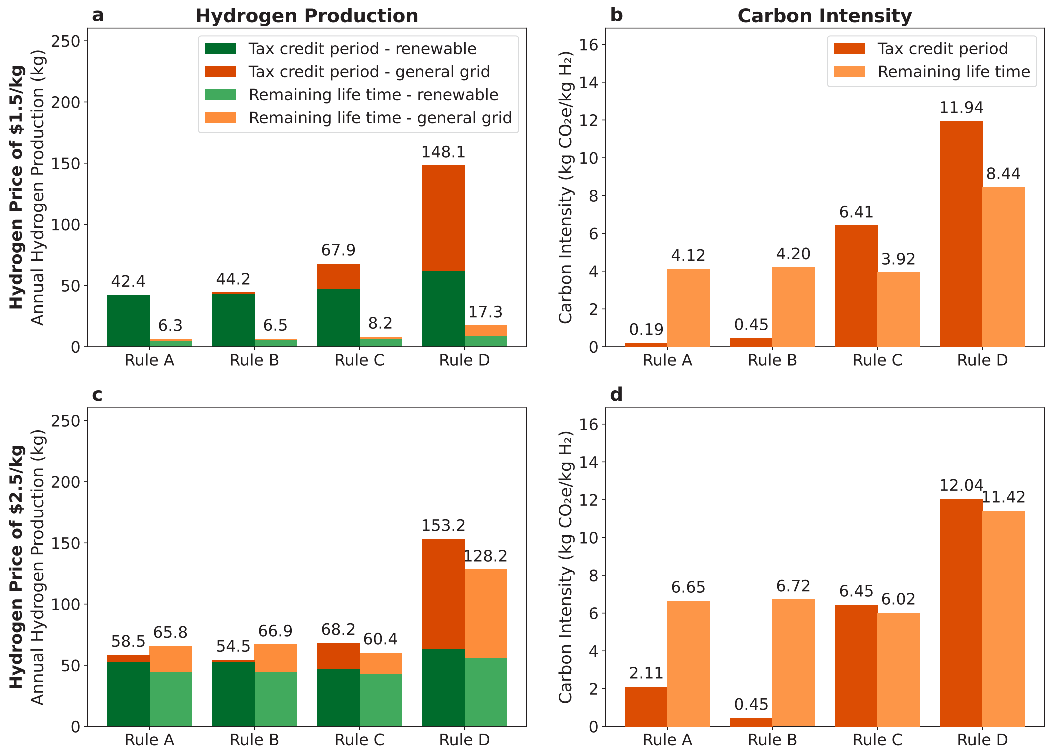


Figure 3. Life-stage performance under different carbon accounting rules.

This figure shows the impact of accounting rules A (hourly tax credits), B (annual tax credits), C (incremental renewable energy) and D (non-incremental renewable energy) on (a and c) the annual hydrogen production and (b and d) the annual carbon intensity of hydrogen, given hydrogen prices of \$1.5/kg and \$2.5/kg. Annual hydrogen production is calculated based on a renewable power generation capacity of 1.0 kilowatt peak.

We initially calibrate our economic model to reference plants eligible for the production tax credit specified in the Inflation Reduction Act in the current economic context of the US (see Figure 1). Contrary to common expectations, we find that the hourly carbon accounting rules provide investors with sufficient incentives to invest in PtG systems today, with internal rates of return between 8.6-14.7% for hydrogen sales prices between \$1.0-3.5 per kilogram (kg) (see Figure 2). Yet, they also result in life-cycle average carbon intensity levels between 0.1-8.7 kg of carbon dioxide equivalents per kg of hydrogen (kg CO_2e/kg H_2). These estimates are lower than those for conventional "grey" hydrogen but, for hydrogen prices above \$1.5/kg, comparable to those for "blue" hydrogen produced from natural gas with carbon capture. The surprisingly wide range of estimates emerging from our analysis reflects the incentives for investors to utilize capacity by procuring increasing amounts of carbon-intensive electricity from the general grid as hydrogen prices rise (see Figure 3). This effect becomes particularly pronounced once the tax credit eligibility expires after the first ten years of an investment.

We further find that the annual carbon accounting rules lead to significantly higher profitability of PtG systems, with internal rates of return between 10.4-22.5% for hydrogen prices between \$1.0-3.5/kg (see Figure 2). These upper estimates lie substantially above the typical range of investment returns available for renewable energy infrastructure, which speaks to the frequently voiced concern that tax credits of up to \$3.0/kg could lead to excessive returns for investors. Our calculations also project significantly higher life-cycle average carbon intensity levels between 6.0-12.5 kg CO_2e/kg H_2. The lower end of this range falls right in the middle of estimates for blue hydrogen, while the upper end is comparable to lower estimates for grey hydrogen. The higher estimates for both profitability and carbon intensity now reflect the incentives for investors to convert substantially more carbon-intensive electricity from the general grid, both during and after the tax credit period (see Figure 3).

Our paper contributes to the emerging literature on the role of carbon accounting in determining the effectiveness of climate policies. In particular, most recent studies on the policy support for electrolytic hydrogen consider a (central) planner seeking to minimize the total cost of an energy system subject to meeting given demands for electricity and hydrogen. These studies then assess changes in the total cost and emissions of the system depending on whether the hydrogen demand is met by converting (non-)incremental renewable energy on different temporal intervals. In contrast, our analysis takes the perspective of a representative investor seeking to maximize the net present value of investments in PtG systems in response to policy support for electrolytic hydrogen. This approach enables us to examine how the financial and emission performance of PtG systems is shaped by alternative accounting rules. Such an analysis has been missing in the literature.

Global Climate Policy Project Unveils Roadmap for Climate Coalition

By: MIT Sloan Office of Communications

Cambridge, MA, September 16, 2025 —

The Global Climate Policy Project at Harvard and MIT today released its flagship report detailing how a voluntary coalition of countries coordinating carbon prices could slash global emissions and raise billions for mitigation and adaptation, while avoiding a patchwork of unilateral border carbon measures.

The report, entitled "Building a Climate Coalition: Aligning Carbon Pricing, Trade, and Development," was developed with insights from a working group that included thought leaders and academics from many of the world's major emitting countries.

Prepared for release in the run-up to the 30th United Nations Climate Change Conference (COP30), the report sketches a pathway to decarbonize heavy industry regardless of the pace of global consensus in the UN Framework Convention on Climate (UNFCCC) process and without sidelining developing-economy priorities.

"Our modeling shows that a well-designed carbon-pricing coalition can deliver large-scale climate action and prevent a chaotic patchwork of border levies."

— Catherine Wolfram
William Barton Rogers Professor in Energy
MIT Sloan School of Management

COP30 host Brazil has placed the report's proposal on its agenda and is convening allied countries for technical sessions ahead of and during the summit.

Many countries have begun introducing carbon pricing for heavy industry. Building on this momentum, the report includes modeling scenarios to quantify emissions, revenue, and trade effects under multiple coalition designs (different carbon prices, border measures). It also spells out an incentive package for low- and middle-income countries that would not undermine domestic production or spark trade conflicts.

The models predicted several promising outcomes. Key findings included:

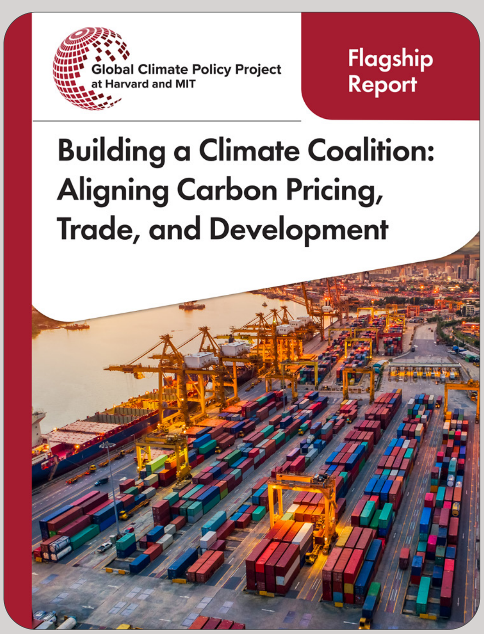
- Seven-fold emissions reduction: Coalition members cut emissions roughly seven times more than the current policy trajectory.
- Nearly $200 billion in projected annual revenues: Most of those funds were raised domestically – rather than through carbon border adjustments – providing coalition members with resources for clean-energy investment and social programs.
- Manageable price impacts: Commodity prices rose moderately in target industries, with negligible output loss for coalition producers.

"Our modeling shows that a well-designed carbon-pricing coalition can deliver large-scale climate action and prevent a chaotic patchwork of border levies," said Catherine Wolfram, William Barton Rogers Professor in Energy and a professor of Applied Economics at the MIT Sloan School of Management. "At the same time, it could offer incentives for low- and middle-income countries to join the coalition and raise their climate ambitions."

In addition, the report presents concrete options and guidelines for coalition design and implementation. The aim is to help governments and other stakeholders identify practical ways in which multilateral coordination around carbon pricing could enable a range of countries to advance widely held goals for climate mitigation, economic development, and trade.

"By aligning climate ambition with economic incentives, the coalition gives both developed and developing countries a clear, cooperative pathway toward a safer climate future," said Arathi Rao, director of the Global Climate Policy Project at Harvard and MIT.

The Global Climate Policy Project at Harvard and MIT is based at The Salata Institute for Climate and Sustainability at Harvard and at the Center for Energy and Environmental Policy Research (CEEPR) at MIT. The report is available in the Working Papers section of the CEEPR site and on the project website of the Salata Institute.



Download a copy of the full report here:

The GCPP website can be found at https://gcpp.mit.edu

Personnel.

Introducing CEEPR's New Researchers in 2025

We are pleased to welcome these new researchers to CEEPR during the new academic year at MIT:

Lance Pangilinan, *Research Associate*

Lance Cu Pangilinan is a Research Associate at at CEEPR with a principal interest in the distributional impacts of climate change on location choice for both consumers and firms. He holds an M.A. in International & Development Economics from Yale University and a B.A. in Economics (Honors) from the Ateneo de Manila University. Before joining CEEPR, he assisted research on spatial models, production networks, and machine learning methods, and supported policy analysis at the Philippines' Department of Finance, including work on public-private partnership evaluations and macro-evaluation of the Philippine economy.

Reese Dobson, *Graduate Research Assistant*

Reese Dobson is a Graduate Research Assistant at the MIT Center for Energy and Environmental Policy Research and is currently pursuing an S.M. in Technology and Policy. She is working on a project with Professor Christopher Knittel exploring the economics behind critical minerals for the energy transition. Reese has a bachelor's degree in Geophysics from Stanford University where she researched tools and uses of archival radar data from the Greenland Ice Sheet. She is interested in climate change mitigation, earth sciences, and energy affordability.

Mehmet Islamoglu, *Graduate Research Assistant*

Mehmet Islamoglu is a Graduate Research Assistant at MIT CEEPR while pursuing an S.M. in Technology and Policy. His work involves assessing the commercial readiness and policy implications of novel decarbonization technologies. He applies methodologies such as feasibility studies, market analysis, and techno-economic modeling to evaluate emerging energy systems. His current research focuses on turquoise hydrogen technologies, analyzing their potential markets and the policy frameworks required to support their deployment. He earned his B.S. in Computer Science from the Georgia Institute of Technology and is a graduate of Robert College in Istanbul, the oldest continuously operating American school outside of the United States.

Julia Lukens, *Graduate Research Assistant*

Julia Lukens is a Graduate Research Assistant at the Center for Energy and Environmental Policy Research and is currently pursuing an S.M. in Technology and Policy at MIT. Her research with Christopher Knittel focuses on developing new methods for estimating the social cost of carbon, focused on extreme weather events. Before coming to MIT, Julia worked at Regrow Ag building a digital platform to accelerate the decarbonization of agriculture and at Industrial Economics, Inc. supporting environmental policy development, implementation, and evaluation. Julia holds a bachelor's degree in chemistry with a minor in economics from Wellesley College.

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in partnership with the University of Cambridge

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Spring 2026 CEEPR Research Workshop

May 20-21, 2026
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Kimberly A. Clausing, Allan Hsiao, Gilbert E. Metcalf, Marilyn Pereboom, Catherine Wolfram, June 2025

WP-2025-12
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Kimberly A. Clausing, Jonathan Colmer, Allan Hsiao, and Catherine Wolfram, June 2025

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Joshua Hodge moderates a session on Opportunities for the Energy Transition in the Baltic Sea Region at the 2025 CEEPR European Energy Policy Conference. This year's conference, titled "Powering Europe's Future: Navigating a Sustainable Energy Transition with Security and Affordability," was organized jointly with the University of Cambridge and ORLEN S.A. and held on June 23-24, 2025 in Warsaw, Poland.

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