



**The Coalition
of Finance Ministers
for Climate Action**

C3A's assessment of the emerging analytical needs of Ministries of Finance: opportunities and challenges

Coalition for Capacity on Climate Action (C3A)

William Hynes, Anna Murphy, and Etienne Espagne

A contribution to the 'Compendium of Practice from a Global Community of Ministries of Finance and Leading Organizations: Economic analysis and modeling tools to assist Ministries of Finance in driving green and resilient transitions'

Topic: Enhancing analytical capacity in Ministries of Finance

June 2025

Access the full Compendium at www.greenandresilienteconomics.org

This contribution was prepared at the request of, and with guidance from, the Ministry of Finance of Denmark as Lead of the Coalition's Helsinki Principle 4 initiative 'Economic Analysis for Green and Resilient Transitions' and its Steering Group, with input from its Technical Advisory Group. The views, findings, interpretations, and conclusions expressed are those of the authors. While many Coalition members and partners may support the general thrust of the arguments, findings, and recommendations made in this contribution, it does not necessarily reflect the views of the Coalition, its members, or the affiliations of the authors, nor does it represent an endorsement of any of the views expressed herein by any individual member of the Coalition.

© The authors, 2025

Licensed under [CC BY-NC 4.0](https://creativecommons.org/licenses/by-nc/4.0/).

A “demand-led” program

As outlined elsewhere, C3A is a “demand-led” program, facilitating capacity-building and knowledge-exchange on analytical tools and models for decision-making on climate and nature in Ministries of Finance. It being demand-led means MoFs set the agenda and C3A works with them to identify the most appropriate analytical approach and resulting policy solutions. This demand-led approach to capacity-building is critical for MoFs to make informed policy decisions.

The consultative process

The program is an ongoing consultative process rather than a discrete “demand assessment” exercise. The C3A team spent nine months working with MoF at various levels—Ministers, Deputy Ministers (including CFCMA Deputies), technical staff, and analysts—to identify thematic and regional “Hubs”, workplans, and research areas, and to inform preliminary research work.¹ Interviews on policy and analytical challenges provided feedback and peer review on a proposed way forward.² Conferences in Brasilia, Almaty, and Uganda helped build a network of officials and featured in-depth discussions on national and regional issues. A workshop on macro-modeling in Almaty revealed demand from Kyrgyzstan, Kazakhstan, and Tajikistan for shared regional scenarios and follow-up in the form of a climate macro-modeling community in Central Asia. In Latin America, a conference and technical training sessions elicited consensus on the need for better tools to understand the interdependence between nature and macroeconomic dynamics at a regional level, as well as to build an ecosystem of modelers in Brazil to inform the implementation of the Ecological Transformation Plan.

Shared concerns

The C3A program found that while there are diverse country- and region-specific needs, shared concerns have emerged. Navigating the low-carbon transition and nature loss in the context of increasing climate disruption poses a range of policy, analytical, and capacity challenges for MoFs. They are concerned about the risks of the transition to macroeconomic and financial stability, and how to harness opportunities for economic growth, jobs, fiscal revenues, and exports. Prevailing analytical approaches are ill-equipped to deal with the core characteristics of these problems: nonlinearity and rapid change, complexity and interconnectedness, and high scientific, technological, and policy uncertainties. Policy experience and analytical solutions are nascent but need significant resources to pilot, refine, and scale—all in the context of urgency combined with constrained fiscal space and political environments.

Capacity constraints on macroeconomic analysis of climate action

MoFs face capacity constraints on macroeconomic analysis of climate action: the macroeconomic implications of climate damages, low-carbon transitions, and tipping points for nature loss are under-examined by MoFs. Few countries have policy frameworks, macroeconomic models, and debt sustainability analyses that effectively integrate the economy’s exposure to climate-related physical, transition, and contingent liability risks. Models are needed that can evaluate financial and fiscal risks

¹ Engagement included C3A program workshops in Paris (June 2023), Santiago (September 2023), Marrakech (October 2023), Almaty (May 2024), and Brasilia (June 2024), a workshop on green macroeconomic modeling co-hosted by the Coalition of Finance Ministers for Climate Action in Venice (November 2023), an online workshop for each hub (January to March 2024), and the Sherpa meeting of the Coalition of Finance Ministers for Climate Action in The Hague (February 2024), where C3A gained feedback from Coalition deputies on proposed hub workplans. C3A’s work is also informed by foundational and ongoing engagement by partners including the Coalition of Finance Ministers for Climate Action, and projects such as the Economics of Energy Innovation and System Transition (see <https://eeist.co.uk/>). The Coalition’s Guide was based on extensive consultation, and a forum on the macroeconomics of green and resilient transitions hosted by the governments of the U.S. and Denmark together with the Coalition of Finance Ministers and the Bezos Earth Fund (April 2024) has also fed into C3A demand-assessments.

² C3A’s recently published report, *Analytical Tools for Innovation and Competitiveness in the Low-Carbon Transition*, for example, involved working with MoFs and analysts on case studies describing the use of different analytical approaches in Angola, Brazil, Czechia, Georgia, and South Africa, and was peer reviewed by finance representatives from Brazil, Uganda, and the U.S.

reflecting the dynamic feedbacks in the economy. MoFs increasingly seek to mainstream nature into their agenda, but clear scenarios and appropriate modeling approaches are lacking.

Forecasting and technology deployment

MoFs particularly want to be able to forecast and then accelerate rapid technology deployment. This involves establishing a framework to build a policy agenda for cost-effective sectoral decarbonization, and identifying opportunities to build competitive, high-employment and revenue-generating industries in clean technology components, products, tasks, and business services as part of green supply chains. This requires decision-making frameworks to evaluate the risks and opportunities in the context of uncertainty, accurate forecasting for technology cost declines, economic models that integrate key dynamics of structural change, and tools to identify areas of potential competitive advantage in the context of the global transition. While some MoFs have articulated clear demand, in others, such an agenda is still seen as beyond their scope and mandate.

Assessing demand, and nature decision-making

Accurately assessing demands is a challenging and iterative process, but the work of C3A has revealed the critical aspects of climate and nature decision-making in MoFs. Identifying the most relevant officials to speak with inside MoFs can be challenging for a number of reasons. Officials are constrained by a lack of political signals and prioritization of climate and nature issues; analytical skills are often absent; and there are competing priorities and needs to build conventional macro-fiscal capacities. There are also institutional constraints, and siloed thinking and acting means the role of MoFs tends to be seen as specific and limited. As a result, MoFs are often lacking dedicated teams with the responsibility of embedding climate and nature within decision-making.

Demand requires strategic, holistic thinking and decision-making

Due to some of these capacity constraints, demand is not always clearly articulated and can focus on relatively narrow issues rather than strategic, holistic thinking and decision-making. Not slipping into a “supply-led” approach requires care in agenda-setting, transparency about assumptions of analytical approaches, and a balance between being “demand-led” and encouraging MoFs to lean in to a more ambitious and strategic role (as advocated by the Coalition), including in developing better analytical approaches to meet their needs.

Cutting edge analytical approaches can be less tested or refined

The most cutting edge or appropriate analytical approaches are sometimes less tested or refined than prevailing approaches, creating an imbalance between high demand and nascent supply. For example, the FSMAT³ tool enables countries to explore dynamic financing options for the transition. Building modeling capabilities in the FTT tool,⁴ which informs cost-effective policy(s) for decarbonizing power, transport, and other sectors, is a key bottleneck in scaling its use.

Laying the foundations for MoF leadership on climate action

C3A is laying the foundations, building the analytical tools, and establishing the connections and networks necessary for demand to evolve as momentum builds for MoFs to take on strategic leadership for climate action (see Table 1). It is expanding its partnerships, offering both bespoke modeling solutions such as FSMAT, widely applicable to modeling partnerships, and simple

³ FSMAT stands for Financial Sector Mitigation and Adaptation Tool. Co-developed between the WB and AfD, it allows the macro-financial and environmental impacts of different financing strategies for transition or adaptation pathways to be assessed. Its relevance to MoFs is explained in C3A's recently published report Financing Strategies for the Low Carbon Transition.

⁴ Future Technology Transformations tool (see more detail at <https://www.e3me.com/what/ftt/>). Its relevance to MoFs is discussed in the recently published report Analytical Tools for Innovation and Competitiveness in the Low Carbon Transition.

implementation guidance on risk opportunity analysis.⁵ Based on the experience of C3A, demand assessment can be considered as long-term relationship-building, ongoing dialogue, and collaborative, iterative problem-solving.

Table 1. Frameworks and tools for policy decision-making

POLICY QUESTION	RELEVANT FRAMEWORKS AND TOOLS
How can innovation and investment in low-carbon technologies drive economic development and improve a country's economic prospects?	Industrial strategy frameworks (horizontal and innovation-driven) Macroeconomic models
Which technologies have the greatest potential for further innovation and cost reduction, in each of the sectors most affected by the low-carbon transition, and which policies best enable them?	Probabilistic learning curves Market-shaping frameworks Multi-level perspectives on transitions Risk-opportunity analysis Robust decision-making Systems mapping with causal loop diagrams Sector-specific system dynamics models Sector-specific agent-based models
How can countries identify sectors or product categories relevant to the low-carbon transition in which they could be internationally competitive, and which policies can enable competitiveness?	Economic complexity analysis Labor market models (Gravity models) (Revealed comparative advantage) Market shaping framework Innovation-driven industrial strategy frameworks Risk opportunity analysis Robust decision-making Systems mapping with causal loop diagrams Sector-specific agent-based models
What will be the macroeconomic effects—on employment, economic growth, and the trade balance—of sector-specific technology innovation and diffusion policies?	Macroeconomic models (e.g., macroeconometric models such as MFMOD; CGE models such as MANAGE; or disequilibrium models such as OMEGA or FSMAT) Labor market models
How should the transition be funded? How can policies best mobilize private investment into clean technologies?	Sector-specific agent-based models
What are the likely and plausible macroeconomic implications of nature loss and the nature transition?	Input-output models System dynamics and "non-equilibrium" models (e.g., E3ME, Eurogreen, DEFINE)
Which combination of green financing instruments and derisking tools can achieve greenhouse gas emission reduction while maintaining macro-financial stability?	Stock-flow consistent (SFC) models with disequilibrium and structuralist features (GEMMES, FSMAT).

⁵ Risk-opportunity analysis is an alternative or complement to cost-benefit analysis. See the high-level guidance given in The New Economics of Innovation and Transition: Evaluating Opportunities and Risks, and its relevance to MoFs in Analytical Tools for Innovation and Competitiveness in the Low Carbon Transition.