The Coalition of Finance Ministers for Climate Action

Suite of analytical tools: integrating climate projections into Austria's long-term budget forecasts

Austria—Ministry of Finance

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

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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.

Overview

Austria's long-term budget projection published at the end of 2022 incorporates a climate change dimension by coupling two existing models and therefore integrating climate-related risks—both physical and transition—into the long-term budget projection.[1] Utilizing the *DELTA macroeconomic model* from the Austrian Economic Research Institute and the *MIO-ES model* from the Environment Agency Austria, these tools evaluate long-term trends in government debt, GDP growth, and sectoral emission reduction policies. Key outputs include macroeconomic variables such as public debt ratio, GDP, and government spending, as well as climate indicators such as projected emissions and potential compliance costs for meeting EU targets.

MIO-ES

The MIO-ES model is a hybrid, macroeconomic, national, input-output (IO) model which as well as incorporating economic interdependencies on a monetary basis also fully integrates the energy system in physical units into the economic-energetic analysis. The model is optimally suited to carrying out ecological evaluation of energy and climate-related measures. The current version provides annual results starting from the base year 2014 (i.e. the model is based on the 2014 input-output tables) with a horizon through to 2050. The MIO-ES model is used at the Federal Environment Agency together with sector models (e.g., on the housing and transportation sectors) to create long-term scenarios for Austrian greenhouse gas emissions in accordance with the EU Regulation on the Governance System of the Energy Union. It is also used together with sector models to evaluate the short- and medium-term effects of numerous climate and energy policy measures and packages of measures on the national economy, energy consumption, and CO_2 emissions. While the MIO-ES model is not a forecasting model, it can be used to simulate the effects of measures in an activity scenario in comparison to a baseline scenario and to predict the corresponding effects—within the usual limitations of economic complexity.

DELTA

The Demography-based Economic Long-Term Austrian Model (DELTA) integrates demographic forecasts with important macroeconomic correlations of the Austrian economy and long-term aspects of the national budget. Revenue and expenditure are presented in accordance with the national accounts, so that key fiscal indicators (Maastricht balance, gross debt, etc.) can be derived in accordance with the "Maastricht definitions". The model is generally run using a "no policy change" principle as a premise for the forecast. However, in the Austrian long-term budget projection of 2022, a climate activity scenario was added to the evaluation. Generally, the model takes legal regulations into account insofar as they are in force at the time the data is compiled.

Strengths and limitations

The model suite enables a granular look at how climate policies interact with fiscal metrics, supporting targeted policy decisions. A key strength is the detailed modeling of different economic sectors and the energy system which enables the MoF to enact targeted policy-development and to undertake a first macroeconomic assessment of physical climate impacts. However, the models struggle to adequately represent short-term dynamics such as the COVID-19 pandemic or the energy crisis, and are unlikely to be suitable for forecasting major society-wide transformation processes.

Relevance to Ministries of Finance

For MoFs, these models are vital for assessing the fiscal impacts of climate change, especially in core areas like budget planning, economic policy, and debt management. Outputs such as projected debt ratios under different climate scenarios help MoFs design policies that align with fiscal sustainability goals while preparing for potential EU climate compliance costs associated with emissions targets.

1 See https://www.bmf.gv.at/themen/klimapolitik/green_Budgeting/langfristige_budgetprognose_(klimamodul).html for the report.

Furthermore, designing these scenarios allows MoFs to have a deeper understanding of climate policy processes that can then be utilised in domestic negotiations, among others, in the context of National Energy and Climate Plans that are required by EU legislation.

Key questions addressed, use in practice, and future improvements

This suite of tools assists MoFs in answering critical questions, such as the economic impact of striving for net zero commitments, the fiscal risks of non-compliance with emissions targets, and the budgetary trade-offs of implementing green policies versus conventional approaches. Such tools also raise a number of new questions—in this case, the insights gained were a key input to the Austrian Carbon Management Strategy that was published in June 2024.

MoFs can practically access these insights through the periodic long-term forecasts published by Austria's Ministry of Finance. The tools are accessible through the Ministry's collaboration with research institutes and the Environment Agency Austria, which periodically update assumptions based on the latest EU regulatory requirements. Recent applications include evaluating the fiscal implications of Austria's 2030 emissions targets and the projected cost savings from the country's Renewable Energies Expansion Act. This data has informed Austria's policies on green subsidies and taxation adjustments.

A major takeaway for MoFs is that embedding climate considerations into budget projections requires adaptable models that reflect evolving regulatory and technological landscapes. The Austrian experience shows that, even with limited resources, foundational data can yield robust insights by focusing on high-impact sectors such as energy and transportation.

Future improvements could include enhanced data granularity on sector-specific emissions and better modeling of technological advancements to improve scenario accuracy. Expanding the models' sensitivity to variables like international carbon pricing could further refine fiscal impact predictions.

Conclusion

Austria's integrated approach to long-term fiscal forecasting demonstrates that aligning budget projections with climate policy can prepare MoFs for emerging environmental risks while maintaining fiscal responsibility. Continued model enhancements and international collaboration are key steps for other MoFs looking to adopt similar frameworks.