



ForestNavigator

DI.4 Forest Policy Modelling Forum

Interim Report

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Abstract

Forests play a critical role in meeting the European Union's (EU) climate, biodiversity, and bioeconomy objectives. Effective policy implementation requires alignment between EU-wide frameworks and Member States' (MS) strategies, informed by model-based assessments. Discrepancies between modelling tools and perspectives at the EU and national levels can hinder consistency in forest-related pathways. The ForestNavigator project addresses this challenge through the Forest Policy Modelling Forum (FPMF), a platform fostering dialogue between policymakers and modellers to harmonise modelling approaches and enhance policy support by the modelling tools. This report outlines the rationale and objectives of the FPMF, reviews EU and MS participation during the project's initial phase, provides insights from the first FPMF meeting in September 2024, and presents next steps to strengthen collaboration for informed forest policy-making across the EU.

Keywords

Forest Policy Modelling Forum, governance, modelling, climate mitigation

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Abbreviations

EC	European Commission
EU	European Union
FPMF	Forest Policy Modelling Forum
MS	Member State
WP	Work Package
NECP	National Energy and Climate Plans
LTS	Long Term Strategies
UNFCCC	United Nations Framework Convention on Climate Change
DG	Directorates-General
ENV	Environment
AGRI	Agriculture and Rural Development
ENER	Energy
RTD	Research and Innovation
JRC	Joint Research Centre
EEA	European Environment Agency
LULUCF	Land use, land-use change and forestry

I. Introduction

Forests and the forest sector are important to achieving the new European Union (EU) climate, biodiversity, and bioeconomy goals. While the EU regulations, directives and strategies provide a general policy framework, the implementation is carried out at the individual Member States (MS) level. The European Commission relies on model-based policy impact assessments for setting policy targets; at the same time, MS rely on similar model-based assessments for setting national-level policy targets and national pathways for achieving them. Using different modelling tools and policy perspectives at the EU and National scales leads to possible inconsistencies when comparing forest pathways at the two scales, which requires an open dialogue between the actors involved.

Consistent ex-ante modelling approaches across MS and between the EU and MS are needed to enhance the reliability and effectiveness of forest policy impact assessments and policy implementation in the EU. The ForestNavigator project has recognised such a need and designed a new platform for enhancing the dialogue between the actors based on their respective modelling tools.

The **Forest Policy Modelling Forum** (FPMF) brings together policymakers and modellers at the MS and EU level for a dialogue based on ex-ante modelling needs to support forest policy-making across the EU.

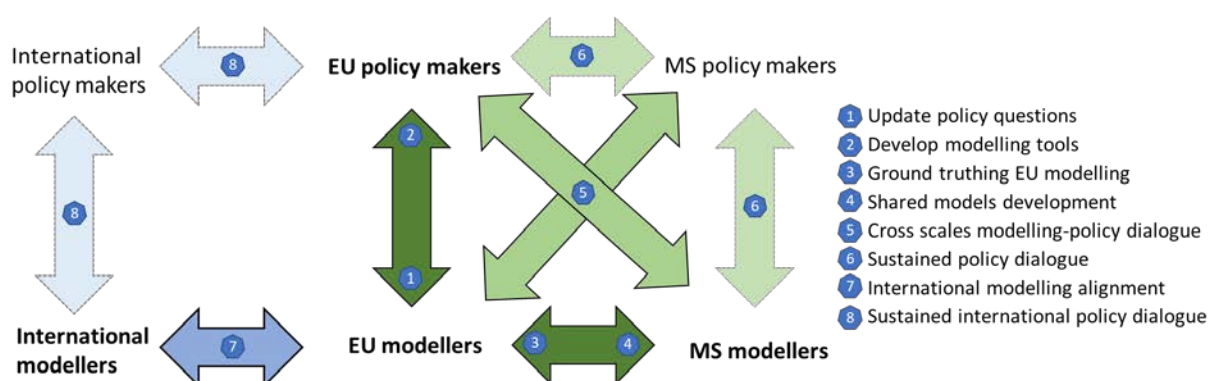
This report describes the following:

- the rationale, aims, and objectives of the FPMF
- EU and MS policymaker and modelling team participation during the first two years of the ForestNavigator project
- An overview of the 1st FPMF meeting on September 18 and 19, 2024
- Next steps

2. The Forest Policy Modelling Forum Aim and Concept

2.1. Aims and objectives

A new **Forest Policy Modelling Forum** brings together policymakers and modellers at the MS and EU levels for a dialogue based on ex-ante modelling needs to support forest policy-making across the EU. In this dialogue, the ability of biophysical and socioeconomic models to inform policies with forward-looking assessments depends on their capacity to represent policy questions, evolving scenarios, and emerging sectorial issues such as impacts of natural disturbances and robustness of policy pathways. The FPMF will allow us to discuss how modelling approaches can help tackle current policy questions and share modelling techniques that are readily transferable across geographies and scales. The Forum will discuss best modelling practices and common interpretation of policies and thus enhance comparability of resulting pathways, the quality of policy impact assessments and policy effectiveness.



Aims:

1. Discuss emerging policy questions with EU decision-makers.
2. Develop new modelling tools to address the emerging EU policy questions.
3. Validate EU-scale ex-ante modelling with the support of national modellers, allowing for enhanced consistency between EU and MS modelling assumptions and resulting sectorial pathways.
4. Accelerate the development of new modelling features and best practices available to MS.
5. Strengthen the cross-scale dialogue between modellers and policymakers to align MS pathways with EU policy expectations.
6. Sustain the dialogue between EU/MS policymakers by access to common modelling assumptions and outcomes.
7. Enhance the alignment between EU and international modelling.
8. Sustain the international policy dialogue by sharing common experiences.

This community will help anticipate and respond to policymakers' needs through its fostered model developments. Potentially arising common baseline scenarios and model-based assessments will contribute to publications that inform the scientific and technical community about the most relevant advancements.

The ForestNavigator Horizon Europe research project will support the Forum's first four years of life: <https://www.forestnavigator.eu/forest-policy-modelling-forum>. Key participants from the EU and national institutions have already expressed interest in establishing a long-lasting community beyond the project's lifetime and enlarging this community to reach the entire EU-27 MS representativeness.

2.2. FPMF participation to date

The Forum hosts modellers and policymakers from the EU region. To date, the following participants were involved:

- Modellers providing support to a series of policy instruments related to forest sectors such as National Energy and Climate Plans (NECP), Long Term Strategies (LTS), greenhouse gas inventories and United Nations Framework Convention on Climate Change biennial submissions, and other model-based ex-ante assessments impacting forest-related policymaking at the National and EU scales.
- Forest sector experts from EU and National Agencies providing technical support to decision-makers and thus often acting as a bridge between modellers and governments.
- Forest sector researchers and experts assisting MS authorities.
- Policy makers and decision makers involved in forest-related policies at the EU scale, EC Directorates-General (DG), and National scale (National Authorities).
- EU and national agencies responsible for data used in models and monitoring policy implementation progress.
- Members of international institutions performing model-based ex-ante assessments.

Policymakers and agencies

Besides jointly organising the Forum with the Directorate General for Climate Action (DG-CLIMA), to date, the FPMF has involved representatives from the following EC DGs:

- Agriculture and Rural Development (DG-AGRI)
- Environment (DG-ENV)
- Energy (DG-ENER)
- Research and Innovation (DG-RTD)
- Joint Research Centre (DG-JRC)

During the first two years, representatives of the European Environment Agency have also participated in the Forum's activities.

Policymakers working with forest-sector-related policies at the national scale from the:

- Czech Republic (Ministry of Agriculture)
- Ireland (Department of Agriculture, Food and the Marine)
- Finland (Ministry of the Environment)
- Slovakia (Ministry of the Environment)

Additionally, a representative of a national agency has also participated:

- Austria (Environment Agency Austria)

Modellers and models

Overall, 12 national modelling experts with expertise crossing ten countries were involved in the Forum. Specifically, the modelling teams were in:

- Bulgaria (Forest Research Institute - FRI)
- Czechia (Institute of Forest Ecosystem Research - IFER)
- Germany (Thünen Institute)
- Finland (Natural Resources Institute Finland - Luke)
- Hungary (University of Sopron)
- Ireland (Forest, Environmental Research & Services - FERS)
- Italy (Roberto Pilli)
- Netherlands (Wageningen University & Research - WUR)
- Romania (National Research and Development Institute in Forestry)
- Sweden (Swedish University of Agricultural Sciences - SLU, Lund University)
- Norway (Norwegian Institute of Bioeconomy Research - NIBIO)

The modellers involved have presented and contributed to the Forum discussions up to date with the following 11 models:

- CBM-CFS3-CZ (Czech Republic forest model operated by IFER)
- CBM-CFS3-IE (Ireland forest model operated by FERS)
- CBM-CFS3-IT (Italy forest model operated by Roberto Pilli)
- EFISCEN-Space (EU-scale forest model operated by WUR)
- EU-CBM-HAT (EU-scale forest model operated by JRC)
- GLOBIOM-G4M (EU/Global-scale land use and forest model operated by IIASA)
- Heureka (Sweden forest model operated by SLU)
- MAGNET (EU/Global-scale economic model operated by WUR)
- MELA (Finland forest model operated by Luke)
- SiTree & PixSim (Norway forest model operated by NIBIO)
- TiMBA (EU/Global-scale economic model operated by Thünen Institute)

3. 1st FPMF meeting, 18-19 September, 2024

3.1. Preparation for the meeting

In preparation for the 1st FPMF, a series of preparatory meetings occurred among a core team of organisers during 2022-2024, including IIASA, DG-CLIMA and ForestNavigator selected modelling partners. The preparatory meetings allowed the identification of national and EU policymakers and modellers to be approached for the 1st FPMF meeting and to develop a first version of the protocol to be utilised for modelling intercomparisons in the Forum (see also [Deliverable 6.1](#)). The support of the sister projects PathFinder and ForestPaths further contributed to the expansion of modellers and policymakers included in the Forum. IIASA has also developed the [IIASA Accelerator](#) web platform, which assists with FPMF modelling activities.

3.2. Meeting

The FPMF convened for the first time in Brussels on September 17-18, 2024. The event aimed to enhance understanding of existing forest models, explore their applications, and address future development needs according to arising policy questions. Overall, 52 experts attended the meeting. The first day of the FPMF provided the participants with an overview of the objectives of the Forum, the status of using models for supporting policy assessments and emerging policy questions related to climate, biodiversity and bioeconomy. During the second day, modellers presented model developments and early results from a model intercomparison. Policymakers pointed out the need for model developments and future FPMF engagements.

A detailed agenda and presentations of the two-day meeting are available online at the following link: <https://www.forestnavigator.eu/forest-policy-modelling-forum/>

Introduction to the Forum activities

DG-CLIMA and IIASA opened the Forum by stressing the importance of the forest sector in achieving the EU 2050 climate neutrality objective. In this context, the modelling community can provide decision-makers with forest pathways to achieve the 2030 climate mitigation targets and sustainable contributions from the forest sector to the 2050 EU climate neutrality. To efficiently achieve the mitigation targets, there is a need to harmonise EU-level and national modelling efforts to reduce cross-scale inconsistencies, thereby improving policymaking across scales. Hence, the FPMF is expected to provide a decisive contribution. The objective of the FPMF is also to create an efficient dialogue between policymakers and modellers by improving the understanding of what models can deliver, their limitations, and how they can better represent policies.

Session: How are forest-related impact assessments used for EU and national policies?

The session explored the role of models in EU policymaking, according to the experiences of DG-CLIMA, emphasising the importance of integrated impact assessments for evaluating both expected and unexpected policy effects. The model-based impact assessments, incorporating multiple sectors, have informed key EU legislation and policies such as the LULUCF Regulation and the Fit for 55 Policy Package. Integrated modelling applied in impact assessments take an economy-wide approach to assess impacts on climate mitigation, biodiversity, and the economy, ensuring cross-validation of outputs for the different sectors.

National policymakers from Ireland and Sweden shared examples of how models supported updates to their climate action plans, showcasing effective collaboration between modelling and policymaking at the national level. During the session, attendees had the opportunity to exchange on the updating of national targets for the forest sector in their climate action plans and modellers were able to gain more insights into how policymakers use information such as modelling uncertainty in their work.

Session: Opportunities and challenges in using models in forest-related policy support

JRC and IIASA addressed opportunities and challenges in using models for forest-related policy support. Key challenges highlighted include inconsistencies in greenhouse gas inventories, mismatches between Forest Reference Levels and national projections, and gaps in linking forest management to harvested wood products. Furthermore, EU and national models used for policy support were compared, noting that EU models excel in long-term trend analysis and cross-sectoral comparability. In contrast, national models provide detailed insights using National Forest Inventory data. Future model adaptations are needed to capture climate-driven changes in forest dynamics better, improve projections of forest growth and natural disturbances, and enhance linkages to biodiversity and the bioeconomy.

Session: Carbon representation and climate mitigation policy implementation in EU and national models

The session focused on modelling approaches related to forest carbon and their applications in informing forest-related policies. Presenters from IIASA discussed the integrated GLOBIOM-G4M EU-scale modelling framework for the LULUCF sector, showcasing its use in key policy impact assessments related to EU climate policies, including the EU Reference Scenarios, Fit for 55 Impact Assessment, and the Climate Target Plan 2040.

Next, two national examples of models applied for climate policy support at the national level were presented. The CBM-CFS3 model was applied to the Czech and Irish forest sectors, using NFI data. The models effectively addressed country-specific challenges such as the severe drought-induced bark beetle outbreaks and impacts on emissions in the Czech Republic and the modelling of forest carbon pool dynamics in forests managed on peatland soils in Ireland.

Panel presentations: climate policy developments entailing model improvements

DG CLIMA representatives outlined recent policy developments, emphasising the need for enhanced integration of modelling and monitoring within the Carbon Removal Certification Framework. They highlighted the importance of analysing synergies between climate mitigation and biodiversity.

A national-scale example from Finland highlighted the importance of forest carbon dynamics in the context of national climate policies. Past modelling intercomparisons were discussed, with a call for more actionable tools for policymakers and better equipped to capture recent climate-carbon feedback dynamics.

The panel discussion suggested that to support climate and land use policies, model developments should be directed towards:

- Quantifying impacts of forest management adaptation measures
- Integrate bioeconomy, climate and biodiversity considerations, as well as water
- Comprehensive modelling approaches should include all relevant sectors connected to land use
- Integrate albedo and other climate feedbacks
- Include emerging policy demands for timely short-term or spatial high-resolution projections

- Enhance models to account for climate-induced changes

Session: Biodiversity representation and conservation policy implementation in EU and national models

IIASA presented results from the BIOCLIMA project, which used GLOBIOM-G4M and species distribution models to analyse EU-scale climate and biodiversity-integrated policy scenarios. The findings revealed synergies and trade-offs between climate goals, biomass demands, land use, and biodiversity outcomes when focusing on specific biodiversity indicators by means of the ibis.iSDM species distribution model coupled to IIASA's land use models.

An example of modelling forest biodiversity pathways was presented for Sweden, where the Heureka forest model and coupled species distribution models are calibrated with National Forest Inventory data. The Swedish tools were applied to explore policy-relevant scenarios tied to forest structural variables.

Panel presentations: Biodiversity conservation policy developments entailing model improvements

A representative of DG ENV emphasised key priorities needed for modelling biodiversity policies, including modelling ecosystem conditions, improving measurement of biodiversity-friendly practices, and fostering synergies between climate and biodiversity policies at the landscape level. The importance of socio-economic approaches and modelling biodiversity in connection to Nature Restoration Plans was also stressed, particularly regarding indicators like the forest bird index and structural changes in forests.

During the session, attendees discussed forest biodiversity indicators relevant to assessing policy progress, highlighting biodiversity modelling in the Czech Republic for the Nature Restoration Law and the associated Nature Restoration Plans. Priorities for model development included understanding how forest management practices and structural indicators, such as deadwood, influence biodiversity. Attendees also raised the importance of appropriately refining the indicators' representation in forest models and understanding the relationship between structural indicators, such as deadwood, and biodiversity.

Bioeconomy representation in EU and national models and implications for biodiversity and climate policies

The session on bioeconomy modelling and policy emphasised the importance of adopting holistic approaches to better understand the interconnected dynamics of the environment, economy, and society within the framework of the EU Bioeconomy Strategy. A representative of DG RTD underscored the need to assess synergies and trade-offs associated with biomass use and presented models like the Integrated Bioeconomy Land Use Assessment (IBLUA) to address challenges such as the interplay between biomaterials, bioenergy, and cascading biomass use. The JRC reiterated the value of integrated bioeconomy models incorporating local knowledge and organising complex data into structured insights to support informed decision-making. As a complement, a DG ENE representative underlined the critical role of energy modelling to guide biomass-related policy decisions.

A national modelling effort from Slovakia, which optimises forest biomass use according to the needs of an NECP, highlighted challenges like forest age structure, climate risks, and sustainable bioenergy pathways. Finally, the MAGNET model was presented as an economic modelling tool for simulating land-use regulation policies and integrating socio-economic factors such as employment, wages, and sectoral gross domestic product into forest policy modelling.

Session: Update on EU and national model developments exploitable for policy support

Day 2 of the Forum started with showcasing advancements in forest and land-use modelling at EU and national scales. IIASA presented enhancements to GLOBIOM/G4M, focusing on capturing climate change impacts and disturbances on EU forests for large-scale land-use optimisations. Luke demonstrated improvements to the MELA forest model considering the issue of continuous cover forest management on Finnish peatlands, integrating forest soil modelling in mitigation pathways. WUR highlighted EFISCEN-Space's ability to incorporate plot-level NFI data for spatially explicit modelling of EU forests. The JRC introduced the EU-CBM-HAT model, which uses high-resolution remote sensing data for modular, spatially explicit simulations. NiBio showcased the SiTree and PixSim models for Norwegian forests, combining detailed forest structure data from NFI and remote sensing for forest pathways projections at the national scale. The session concluded with Thünen Institute presenting TimBa, a global partial equilibrium open-source economic model calibrated to analyse the global forest bioeconomy.

Session: Enhancing consistency between National and EU models in the context of climate mitigation policies – Preliminary results of a multi-model exercise

The session focused on a multi-model exercise comparing EU models (G4M, CBM-EU) with national forest models (CBMs) from the Czech Republic, Italy, and Ireland, presented by IIASA. This exercise aims to enhance consistency across models and scales using a standardised reporting template and common scenario assumptions. IIASA also introduced the Accelerator, a web platform designed to support researchers and FPMF activities (<https://accelerator.iiasa.ac.at>). The platform allows for data upload, retrieval, and visualisation, aiding in data exploration. Additionally, the Accelerator enables remote deployment of modelling runs and automation of modelling chains. The Accelerator's data handling and visualisation tools demonstrated early results from the intercomparisons.

Session: Looking back, thinking forward

The final panel included representatives from DGs, national policymakers, and modellers working at both national and EU scales. The session provided an opportunity to reflect on the insights and outcomes of the 1st FPMF meeting and outline future directions for forest modelling and policy-making. The panel emphasised the importance of advancing forest modelling to address complex environmental and socio-economic challenges while fostering collaboration between policymakers and modellers. They reinforced more granular, integrated, and actionable forest modelling to meet the challenges of sustainable forest management in the EU. Collaborative efforts, supported by technological innovation and enhanced communication between modellers and policymakers, will be essential to achieving transformative change in the bioeconomy.

Recommendations from the Panel

The panel offered several general recommendations to enhance the utility of forest models:

- Models should integrate biodiversity and climate considerations, presenting their assumptions and uncertainties transparently to support informed decision-making.
- Experts should curate their outputs into clear and actionable insights for policymakers.

Panelists highlighted the need for forest models to focus on realistic and transformative approaches, which include:

- Moving beyond stylised scenarios: Modelling should reflect diverse management practices and future species-specific conditions.

- Combining management practices and adaptive measures: Models should explore combinations of forest management practices, such as continuous cover forestry, and adaptive measures like shortened rotation periods for certain species.
- Adopting a regenerative bioeconomy paradigm: This paradigm should integrate trade, biodiversity, and socio-economic implications for holistic policy solutions.

The panel further underscored the importance of increasing granularity of forest models to ensure they address localized challenges effectively. Specific recommendations included:

- Forest models need to provide more detailed spatial outputs to address the specific needs of local forest management and align with EU initiatives such as the Carbon Removals Certification Framework (CRCF).
- Models should move beyond national-level overviews to deliver actionable insights that are applicable to local and regional contexts.

The panel also discussed the potential of advanced technologies to enhance forest modelling and policy outcomes. Key points included:

- Combining artificial intelligence (AI) and remote sensing technologies for near real-time analysis could improve the understanding of dynamic forest events, like disturbances, droughts, and interannual variability.
- While AI and machine learning offer promising advancements, their effectiveness depends on high-quality data inputs and rigorous validation processes.

Conclusions

At the end of the meeting, modellers and policymakers agreed that openness and a wider representation of national decision-makers are beneficial for the Forum to bridge gaps between model outputs and practical applications and strengthen collaboration and dissemination for creating more inclusive and comprehensive modelling approaches. Access to comprehensive, harmonised, and more detailed socio-economic data remains an important barrier for the modellers. Hence, involving data providers in the form of EU and national agencies is also crucial. Policymakers and modellers alike agreed that collaboration at the EU and national levels could streamline data sharing and improve model accuracy.

The FPMF was concluded by IIASA and DG-CLIMA remarks on the importance of the above findings and the shared interest in ensuring the long-term sustainability of the established new platform.

Model intercomparison

After the 1st FPMF meeting, a group of modellers participating/interested in the model intercomparison met and discussed in more detail reporting templates to allow for intercomparison of model results. Based on the policy questions discussed during the 1st FPMF, the group also discussed future scenarios relevant for the intercomparison.

3.3. Post-meeting survey

Following the meeting, IIASA and DG-CLIMA launched a survey to collect participant feedback. Semi-quantitative questions investigated how the participants rated agenda, topics, facilitators, speakers and motivation to attend future meetings. Overall, participants (completed by 15 participants, 28% of the 1st FPMF participants) were highly motivated to attend future meetings of the FPMF.

From the qualitative comments included in the survey, the following key points will be taken into account for future events:

- The FPMF was perceived as a very useful and much-needed platform.
- More guided/direct discussion/interaction between modellers and policymakers is needed on specific topics/policies.
- Timekeeping was an issue due to an interesting but very dense agenda, with suggestions to focus on specific topics or organize breakout sessions.
- Involve more MS policymakers and other relevant stakeholders.
- Include more discussion on emerging modelling challenges and opportunities, including Artificial Intelligence.

4. Next steps

The FPMF's next in-person meeting is envisaged to take place early in 2026. In the meantime, a series of online activities will take place. These include expanding the Forum's community while at the same time strengthening the existing group of participants.

During the 1st FPMF, attendees underlined the need to expand the range of national authorities further. Modellers involved are committed to act as ambassadors to their respective national authorities. In addition, an [FPMF webpage](#) with material from the 1st FPMF meeting has been made publicly available. This webpage offers an opportunity to advertise the Forum's activities to interested modellers and policy makers.

Before the next in-person meeting, the model intercomparison exercise initiated within the Forum will continue and further expand through a series of online meetings aimed at designing relevant scenarios, along with standardising protocols for model output and sharing data/results through the Accelerator platform. This activity will strengthen the collaboration between participating modelling teams and is expected to attract more interest from externals.

The 1st edition of the FPMF had an EU focus, future editions will explore the engagement with modellers focusing on other relevant global regions (e.g. China and the U.S.), recognising that the EU forest sector also strongly depends on global developments. The internationalisation of the Forum is expected to improve the alignment to the international policy context and learn from other initiatives conducted outside Europe.

To ensure the long-term sustainability of the FPMF beyond the ForestNavigator project, IIASA and core partners (including DG-CLIMA) will continue to explore funding opportunities for increasing the frequency of in-person meetings.