



Meeting the European Union's Forest Strategy goals:

A comparative European assessment



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Acknowledgements

The report benefited from the helpful comments from external reviewers, Metodi Sotirov, University of Freiburg, Germany and Irmeli Mustalahti, University of Eastern Finland. We wish to express our thanks for their insights and comments that helped to improve the report, and acknowledge that they are in no way responsible for any remaining errors. The authors also wish to thank Šárka Hajtmarová, Lenka Halušková and Zala Uhan for their assistance with the policy analysis.

This work and publication has been financed by EFI's Multi-Donor Trust Fund for policy support, which is supported by the governments of Austria, Czech Republic, Finland, Germany, Ireland, Italy, Lithuania, Norway, Slovenia, Spain and Sweden.

ISSN 2343-1229 (print)
ISSN 2343-1237 (online)

ISBN 978-952-7426-74-6 (print)
ISBN 978-952-7426-73-9 (online)

Editor in chief: Helga Pülzl
Managing editor: Minna Korhonen
Layout: Grano Oy
Cover photo: iVazoUSky / AdobeStock

Disclaimer: The views expressed in this publication are those of the authors and do not necessarily represent those of the European Forest Institute, or of the funders.

Recommended citation: Pecurul-Botines, M., Secco, L., Bouriaud, L., Giurca, A., Brockhaus, M., Brukas, V., Hoogstra-Klein, M.A., Konczal, A., Marcinekova, L., Niedzialkowski, K., Øistad, K., Pezdevšek Malovrh, Š., Pietarinen, N., Roux, J-L., Wolfslehner, B., Winkel, G. 2023. Meeting the European Union's Forest Strategy goals: A comparative European assessment. *From Science to Policy 15*. European Forest Institute. <https://doi.org/10.36333/fs15>



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Executive summary

What is at stake?

The new Forest Strategy for 2030 for the European Union (EU) was adopted in July 2021, creating a new drive for forest policymaking on an EU level. Its main reference is the European Green Deal that puts forests in the light of a decarbonised society until 2050, and emphasises carbon sequestration, biodiversity protection, and forest restoration.

The strategy aims to improve the quality and quantity of EU forests, enhance their multifunctionality and resilience, and address challenges linked to the increasing strain on forests through human activities and natural processes, including climate change. The Strategy's priorities include:

1. supporting the socio-economic forest functions and boosting bioeconomy within its sustainability boundaries;
2. protecting, restoring and enlarging forests in the EU;
3. ensuring a strategic forest monitoring, reporting and data collection and
4. encouraging dialogue and stakeholder engagement.

Compared to earlier versions, the new EU Forest Strategy has become more concrete and comprehensive in its vision and tries to tie in different objectives of the plethora of EU forest-related policies (such as e.g., bioeconomy enhancement, biodiversity protection, climate mitigation and adaptation etc.). The implementation of the new EU Forest Strategy and meeting its goals has therefore potentially larger implications for national authorities than earlier ones, through its stronger embedding in the overall political framework of the EU, although the Strategy as such is not legally binding.

What are the study's aims?

This study assesses whether and to what extent national and regional policy developments meet the EU Forest Strategy goals. It analyses those policies in 15 countries in and outside the EU, as well as in three regions in Spain. The countries are: Austria (AT), Czech Republic (CZ), Finland (FI), Germany (DE), Ireland (IE), Italy (IT), Lithuania (LT), the Netherlands (NL), Norway (NO), Poland (PL), Romania (RO), Slovakia (SK), Slovenia (SI), Spain (ES), and Sweden (SE). Although not a member of the EU, Norway was included into this study as it is closely related through the EEA agreement and a bilateral agreement on cooperation with the EU to fulfil the 2030 climate target.

What patterns emerge?

There is a striking diversity of socio-economic, environmental and political settings for forests and forestry in Europe and even within countries, which affect the impact of the Forest Strategy. Differences related to both ecological site conditions (determining the type of forest), basic socioeconomic factors (such as ownership), societal demands and needs as well as private sector interests, and urban or rural forest settings determine past and current forest governance and management practices in European countries.

At the same time, there are common issues for forest governance and management across Europe, relating to:

- a considerable divide of forestry and conservation interests found in all studied countries;
- the increasing impact of climate change and related forest disturbances (with regionally different consequences for forests and forestry); and

- the embeddedness of European forest governance and markets within larger structures, for example related to (global) energy and resource trade and investment patterns.

Other patterns relate to 'silences' in member states' policies, e.g., missing references to forest-sector specific internal threats to biodiversity, as well as to the risk (and reality) of conversion of old growth forests, or missing action and strategies to collect data that is not (yet) part of 'traditional' monitoring and reporting activities and systems.

Drivers that enhance and/or hinder the implementation capacity of countries and regions include: domestic forest policy developments including the development of shared national/regional visions for future forests; policy fragmentation and restructured administrative competences nationally and in Europe; increasing demand for (new) forest policy goals in the face of a lack of human and financial resources; different interpretations of sustainable forestry and closer to nature practices and a lack of systematic conflict resolution to meet increasing polarisation of ideological positions.

What changes would aid the implementation of the Forest Strategy?

The following policy recommendations differ in nature; some are relevant for the whole of Europe, others are more important for specific countries or groups of countries.

1. **Reconsider and agree on shared European key objectives on forests.** This is critical to move beyond the ongoing sectoral and policy level related competition in forest policy that this study observed for several European countries.
2. **Respect the diversity of forestry settings in Europe and strive for regionally adapted implementation trajectories for European forest policy goals and EU forest related policies.**
3. **Strengthen the social license for forest policy:** involve a diversity of voices including society at large in policy-making at all political levels: EU, national, regional and local.
4. **Invest in knowledge generation and knowledge communication** to improve the evidence-base for forest policy decision making, as well as enable co-creation between science, forestry practice and society.
5. **Connect policy objectives to economic incentives:** forests in Europe are mostly privately owned, with the highest share of income being generated from wood production. The economics of forest management are essential if the broader objectives of the EU forest strategy are to be implemented.
6. **Tackle climate change and use it as a leverage point for a renewed societal deal on forests,** using the pressure resulting from climate change and disturbances proactively as an opportunity to invest in forest adaptation.
7. **Improve information on policy impacts and adapt policies accordingly.** A frequent pattern identified across countries in this study is the lack of reliable information on larger and more complex forest policy effects and impacts.
8. **Establish a cross-country dialogue on forest governance.** European countries have a diversity of political cultures and experiences with different policy instruments which offers huge potential for forest policy to connect and learn from each other.
9. **Increase transparency of forest policy making and implementation at all levels.** Access to information represents an important step to enable society to understand the contributions of public and private forest sector actors to sustainability, and to hold them accountable to the commitments made in policy and practice.

1 Setting the scene

The new Forest Strategy for 2030 for the European Union (EU) was adopted in July 2021, creating a new drive for forest policymaking at the EU level (EC 2021a). Its main reference is the European Green Deal that, in the light of forests' role in a decarbonised society, until 2050, emphasises carbon sequestration, biodiversity protection and forest restoration. It was preceded and followed by debates on the direction of the strategy. A recent analysis (Gordeeva et al. 2022) showed that, in the development of the new EU Forest Strategy, two central conflicts appeared.

The first line of conflict centres around the question of member state sovereignty versus increased European Union competences on forest issues. While some member countries argued that forest policy is a matter for the national domain only, others argued that, from a legal perspective, forests are subject to EU environmental competences that encompass forests (Wydra 2013; Onida 2020). However, from a political science perspective, we can also speak of intersectoral policy areas because of the multitude of EU policy documents that relate directly or indirectly to forests (Winkel and Sotirov 2016; Aggestam and Pülzl 2018; Sotirov and Storch 2018).

The second conflict line centres around whether forests are a commodity or not. This is reflected in the polarised discussion between forest-based industry and environmental NGOs (e.g. Edwards and Kleinschmit 2013; Winkel and Sotirov 2016).

Both lines of conflict are highly relevant for the present study as they reflect the often-nuanced arguments and high stakes at play in Europe's diverse forests – and the politically charged landscapes in which they grow. Against this background it is a balancing act to meet different goals, as also formulated in the European Green Deal, which is the central reference for the EU Forest Strategy (Aggestam and Giurca 2021; Winkel et al. 2022). These goals encompass, first and foremost, climate change mitigation, biodiversity protection, forest restoration and bioeconomy. Arguably, there are multiple trade-offs, but also important synergies between these goals, which are often not directly addressed and require explicit attention when planning the future use of forests (Wolfslehner et al. 2020).

It is also important to understand whether the new EU Forest Strategy leads to a new definition, or even questions the concept, of Sustainable Forest Management (SFM), which has, up to this point, been a central concept for forest management in Europe (as well as promoted globally). Lier et al. (2022) observe in their analysis of EU documents that around two-thirds of the requested information is compliant with current indicator work with some considerable gaps in other areas. Compared to earlier versions, the new EU Forest Strategy is more concrete and comprehensive in its vision and tries to tie in the different objectives of the plethora of forest-related policies. However, its mainly qualitative goals may hamper quantitative assessments. It remains to be seen if member states' forest service sectors are ready for the sustainability transitions called for in the EU Forest Strategy (Takala et al. 2023).

What does this mean at the national level? In the light of ongoing discussions on the implementation of the EU Taxonomy Regulation and the EU Deforestation Regulation, as well as the development of the Nature Restoration Law and the revised Renewable Energy Directive as part of the Fit-for-55 package, expectations of larger changes within the forest-based sector will increase. This has implications in terms of, for example, administration and verification of its operations and, not least, access to finances. These expected changes may also link to the implementation of the EU Forest Strategy specifically, as it will have potentially larger implications for national authorities than earlier ones. This is due to its stronger embedding in the overall political framework of the EU, although the strategy as such is not legally binding. The main elements of the EU Forest Strategy are summarised in Table 1.



Table 1. Selected goals and related actions from the EU Forest Strategy. Source: EC, 2021a.

Goals	Actions
Supporting the socio-economic functions of forests for thriving rural areas and boosting the forest-based bioeconomy within sustainability boundaries	Promoting sustainable forest bioeconomy for long-life wood products (e.g. New European Bauhaus)
	Ensuring sustainable use of wood-based resources for bioenergy, including new criteria and cascading principle
	Developing skills and empowering people for sustainable forest-based bioeconomy
Protecting, restoring, and enlarging EU's forests to combat climate change, reverse biodiversity loss and ensure resilient and multifunctional forest ecosystems	Protecting EU's last remaining primary and old-growth forests, including mapping
	Ensuring forest restoration and reinforced sustainable forest management for climate adaptation and forest resilience, including a "closer-to-nature" voluntary certification scheme, and proposing a legally binding instrument for ecosystem restoration
	Re- and afforestation of biodiverse forests, including planting at least three billion more trees by 2030
	Financial incentives for forest owners and managers for improving the quantity and quality of EU forests, including PES schemes
Strategic forest monitoring, reporting, data collection and Research and innovation agenda	Strategic forest planning in all EU member states at national and, where applicable, regional level
	Legislative proposal for a Forest Observation, Reporting and Data Collection framework
	"Planning our Future Forests" research and innovation agenda
	Research and Innovation partnership on forestry
	Citizens' science programme for forest biodiversity
Dialogue and stakeholder engagement	Member states to establish broad multi-stakeholder dialogue platforms to discuss and inform European, national and local forest policies

The evaluation of the implementation of previous EU forest strategies has indicated that the level of integration of forest-related policies varies, as well as the responsibilities of member states and the Commission (Pelli et al. 2012; Aggestam and Pülzl 2020; Wolfslehner et al. 2019). These studies have also illustrated the considerable variety of forests and forest management across European regions and countries, as well as the different capacities on national levels for implementing forest-related policy targets.

Against this background, the main objective of this study is to assess whether and to what extent national and regional policy developments meet the EU Forest Strategy goals. The present study aims to close this knowledge gap by analysing regional and national policies in 15 European countries and three regions, focusing on four main aspects:

1. The identification of main national/regional forest-related policy goals
2. A comparison of identified national/regional goals to measures as addressed in the EU Forest Strategy
3. The identification of main national/regional forest-related policy priorities and controversies
4. An analysis of factors that enable or hinder policy implementation of the EU Forest Strategy

The study is structured into five chapters. After the introduction, Chapter 2 presents the selected countries with a brief description of the relative importance of forests and other relevant characteristics for each case study country and region and the methodology applied. Chapter 3 gives an overview of the main policy goals and measures in each case study country and region, and their alignment and gaps in relation to the EU Forest Strategy. Chapter 4 highlights the main policy priorities and how controversies and other factors can play a significant role in the implementation of different forest policy targets. Finally, this study concludes in Chapter 5 with key messages and policy recommendations that address relevant topics that need attention in meeting the EU Forest Strategy's goals and in policy integration.



2 Introduction to cases and methods

2.1 Selected countries and regions for the study

This study refers to **15 countries** (in alphabetical order) in and outside the EU: Austria (AT), Czech Republic (CZ), Finland (FI), Germany (DE), Ireland (IE), Italy (IT), Lithuania (LT), the Netherlands (NL), Norway (NO), Poland (PL), Romania (RO), Slovakia (SK), Slovenia (SI), Spain (ES) and Sweden (SE).

The selection of these countries is meant to represent different political, socio-economic and environmental forest-related conditions (Table 2). Although not a member of the EU, Norway was included into this study as it is closely related through the EEA agreement and a bilateral agreement on cooperation with the EU to fulfil the 2030 climate target.



Figure 1. Countries and regions selected for this study.

Some EU countries have devolved forest competences to subnational entities, i.e., regions. This is the case for DE, ES and IT, and to a certain extent also for NL (where provinces are responsible for forest policy implementation, but where frames and ambitions are set on the national level). To gain further regional insights we chose as illustrative examples three Spanish regions: Catalonia, Andalusia and the Basque Country. These are not intended to be representative of Spain, but they are jurisdictional units with their own forest and forest-related competences. They have diversified forest resources and forest management traditions as well as showing different socio-economic aspects; therefore, this selection captures this diversity within national borders.

2.2 High-diversity institutional settings and relevance of forests in Europe

According to the EU Forest Strategy, the sustainable forest management (SFM) concept must consider the multifunctionality and diversity of forests and their three interdependent pillars of sustainability (EC 2021a, p2). Sustainable forest management and multiple forest use are not new notions in European forest management (Wiersum 1995). The concept of “multifunctional” forestry had already started to appear in Europe in the 1960s, emphasising that forests can be managed to provide multiple material and immaterial “goods and services” to meet societal demands. This conceptualisation changed the paradigm of sustainability traditionally focusing on ensuring wood supply in the long term (Hoogstra-Klein et al. 2017). As a result, since the 1990s, most EU forested countries have adopted sustainable-based multifunctionality as a guiding general frame for forest policy and management (Winkel et al. 2009). For instance, the Pan-European Ministerial Conference on the Protection of Forests in 1993 (now Forest Europe) has agreed in its Resolution H1 to a shared definition of SFM which refers to “*the stewardship and use of forests and forest lands in a way, and at a rate, that maintains their biodiversity, productivity, regeneration capacity, vitality and their potential to fulfil, now and in the future, relevant ecological, economic and social functions, at local, national and global levels, and that does not cause damage to other ecosystems*” (MCFPE, 1993, 1).

Several scholars (Wang 2004; Pistorius et al. 2012; Hoogstra et al. 2017) show in their work that, despite this established non-binding definition, there are still different understandings of SFM. While some actors emphasise sustainable timber production, others focus on forests as ecosystems and on conservation, with many nuances in between (Pistorius et al. 2012; Winkel et al. 2011). These different interpretations can also be found in the EU Forest Strategy. On one hand, it acknowledges the economic potential of the forest-based sector for improving its production of sustainable and legally harvested wood (EC 2021a, p.5). On the other hand, the EU Forest Strategy also highlights biodiversity conservation and, in its close-to-nature emphasis, relates to the bigger debate on “multifunctional” forestry. Scholars have shown that SFM and multifunctional forestry are concepts robust enough to unite these different interests, and at the same time flexible enough to meet different local needs and conditions (Hoogstra-Klein et al. 2017). Yet, the agreement on the principle must not be confused with an agreement on what this principle means in forest management practices.

The implementation of the EU Forest Strategy will encounter, in each country, a unique forest-related setting made up of diverging institutional arrangements, governance cultures and views on the socio-economic importance of forests. These settings will determine political choices and, with those, the impact of the strategy.

The 15 country (and regional) cases show the variety of contexts where all the above-mentioned concepts need to be deployed. Building on previous studies commissioned to assess the EU forest strategy (Winkel et al. 2009; Winkel et al. 2011; Pelli et al. 2012), we present our study cases across regional patterns of SFM implementation that are dependent on different conditions: forest area and importance of forest sector in national economy.



Table 2. Forest area and importance of the forest sector for the national economy. Source: adapted from Winkel et al (2009).

	Northern Europe, Baltic States and Central Europe	Western, Central and Eastern Europe	Southern Europe	Western Europe ("Atlantic Rim")	Western Europe
Group of countries included in this study	Finland, Sweden, Norway, Lithuania, Austria, Czech Republic, and Slovakia	Germany, Slovenia, Poland and Romania	Italy and Spain	Ireland	The Netherlands
Forest area	Large in relative terms	Mostly large in relative terms, partly parceled forest	Mostly large in relative terms, but parceled forests	Small, in relative and absolute terms	Small, fragmented properties
Importance of forest sector in national economy	Large	Moderate	Little	Marginal	Marginal

The most recent cross-country forest statistics are compiled in Table 3. These cover forest area, contribution of forest sector (forestry, wood industry and the pulp and paper industry) to national GDP, type of ownership, export/import value of forest products (million EUR), fellings as % of net annual increment in forests available for wood supply** and terrestrial protected forest area with regards to Natura 2000 that are relevant for the present study.

The export/import value of forest products (million EUR) is a good indicator to assess the importance of forest product domestic markets and the role of the countries as exporters. Here, neither non-wood forest products nor nature-based tourism economies are included in this index, which only refers to roundwood, fuel wood, sawn wood, wood-based panels, pulp, paper and paperboard. Markets and net annual increment in forests available for wood supply*** are relevant to assessing to what extent different countries could expand the economic potential of their forest-based sector, from a purely theoretical perspective, i.e., assuming this expansion will not create damage to the ecological equilibrium of forest ecosystems. The share of terrestrial land protected under Natura 2000 gives information about the extent to which countries implement integrated approaches to forest management in nature conservation policies.

Overall, Table 3 shows the high diversity among the selected countries. Forest cover in the selected countries ranges from 11% in the Netherlands and Ireland to 75% in Finland (The World Bank 2020a, 2020b), and the contribution of the forest sector (forestry, wood industry, and the pulp and paper industry) to national GDP ranges from 0.16% in Ireland to 4.22% in Finland (Forest Europe 2020). Forest ownership is also very diversified as, for example, private forest ownership ranges from more than 80% in Norway and Austria to 19% in Poland. With regards to land protected by Natura 2000, we see a range of 13% of protection in Finland, Ireland, Lithuania and Sweden to 38% in Slovenia.

The new information enriches the country cases characterisation. Based on the quantification of GDP and forest cover, some countries (e.g., Poland, Slovakia and the Czech Republic) have been relocated in different groups from the original clusters adapted from Winkel et al. (2009).

Table 3. Comparative overview of country specific forest characteristics

	Forest area* (million ha)	Forest cover*	Terrestrial area under Natura 2000**	Forest ownership**	Forest sector contribution to GDP***	Fellings as % of net annual increment in forests available for wood supply***	Export/import value of forest products (million EUR)***
Austria	3.9	48%	15%	Public 19% Private 81%	1.77%	87%	Export: 5 052 Import: 2 742
Czech Republic	2.7	35%	14%	Public 76% Private 24%	1.75%	84%	Export: 1 619 Import: 1 353
Finland	23.0	75%	13%	Public 31% Private 69%	4.22%	80%	Export: 9 742 Import: 1 073
Germany	11.4	33%	15%	Public 52% Private 48%	0.76%	77%	Export: 14 610 Import: 13 290
Ireland	0.8	11%	13%	Public 52% Private 48%	0.16%	65%	Export: 327 Import: 528
Italy	9.6	32%	19%	Public 34% Private 66%	0.74%	39%	Export: 3 262 Import: 7 069
Lithuania	2.2	35%	13%	Public 62% Private 38%	2.43%	70%	Export: 350 Import: 406
Netherlands	0.4	11%	15%	Public 48% Private 52%	0.42%	48%	Export: 3 029 Import: 4 541
Norway	14.0	44%	-	Public 19% Private 81%	0.58%	60%	Export: 1 264 Import: 910
Poland	9.0	31%	20%	Public 81% Private 19%	1.71%	69%****(2019)	Export: 2 284 Import: 3 173
Romania	6.9	30%	23%	Public 65% Private 35%	1.16%	44%	Export: 1 187 Import: 629
Slovakia	2.0	41%	30%	Public 48% Private 33% Unregistered 19%	2.61%	79%	Export: 1 083 Import: 748
Slovenia	1.2	60%	38%	Public 23% Private 77%	1.94%	61%	Export: 744 Import: 559
Spain	18.6	37%	27%	Public 28% Private 72%	0.61%	56%	Export: 3 217 Import: 3 391
Andalucia (ES)****	4.3	49%	27%	Public: 27% Private: 73%	0.8%	Data unavailable	Data not disaggregated
The Basque Country (ES)****	0.5	68%	20,5%	Public: 46% Private: 54%	1.5%	35%	Data not disaggregated
Catalonia (ES)****	2.0	55%	42%	Public 24% Private 76%	1.6%	30%	Data not disaggregated
Sweden	28.0	69%	13%	Public 22% Private 78%	2.59%	94%	Export: 11 532 Import: 1 710

* The World Bank 2020a, 2020b.

** European Commission 2021b

*** Forest Europe 2020 (GDP includes contribution of forestry and manufacturing of wood and paper products. Forest products include roundwood, fuel wood, sawn wood, wood-based panels, pulp, paper and paperboard)

**** Euskal Estatistika Erakundea 2022; Instituto de Estadística y Cartografía de Andalucía 2022; Institut d'Estadística de Catalunya 2022.



Northern Europe, Baltic States and Central Europe: exemplified by Finland, Sweden, Lithuania, Austria, Slovakia, Czech Republic and Norway.

This group of countries mostly shares a high contribution of forestry to GDP (more than 1.7%) and a larger share of forest cover (between 75 and 35%) in relation to other countries. Within the group we have larger differences, with some countries (such as SE, FI, AT) having higher forest cover and with a long tradition of free markets and private property rights, and other countries (such as LT and SK) with a high share of public forests and a longer tradition on state rules governing their management. These countries might prefer national approaches to policymaking that traditionally emphasise production.

The dominant forest management regime aims to secure the forest sector's economic viability and advances multifunctional forestry at the same time, including even-aged management that is dominating forestry in most of these countries (especially FI, LT, SE – see Pietarinen et al. 2023). Most of the countries in this group have an important role as exporters of forest products (except for LT, if furniture industries are not included). While there are substantial local and regional nuances, sustainable timber production in SE and FI focuses mainly on certain species and forest management systems dominated by even-aged conifer stands. The most common regeneration method is planting and, often, mechanical site preparation. Increasing environmental concerns in these Nordic countries has resulted in calls for diversifying forest management in the last decades.

In LT, although even-aged forestry dominates (with average size of clear cuts under 2 ha), compared to Nordic countries, production forests are more diverse and managed less intensively with longer rotations and considerably more extensive environmental measures (Brukas et al. 2013).

In AT, CZ and SK, the protective functions of the forests are an important part of multifunctional management, owing to more mountainous terrain. The share of natural regeneration is higher in these countries, and clear-cuts are not the standard management form. Instead, there is a variety of small to medium size cuts with a high share of age-class forests. In the last two decades, climate change adaptation and environmental measures in commercial forests have gained more prominence, owing to increasing public concerns and pressure through the markets, though still maintaining high management intensity (Roberge et al. 2016). Balancing biomass needs in a bioeconomy and protection goals is a major topic, while climate change adaptation of forests is the most pressing challenge.

NO, although belonging geographically to Northern Europe and having a vast forest cover, differs from this group as the forest sector's share of GDP is relatively low, mainly due to stronger growth in other sectors. NO is accumulating forest resources and an increasing share of the forest is reaching mature and old age classes. Biological diversity, recreation and other forest ecosystem services than wood production have gained increased public attention and higher priority during the last decades. Ambitious environmental public policies and increased effort from the sector to improve the environmental performance in forest management has followed this development.

Western, Central and Eastern Europe exemplified by Germany, Poland, Slovenia and Romania

This group of countries is characterised by comparatively vast forest resources (between 30-35% of forest cover in most of the cases, except for SI where forests cover 60% of territory) but with a relative low forest sector contribution to the national GDP. The value of imports and export of forest products are balanced within this group, with DE having the greatest market share of both. In contrast to the previous group, a considerable share of their land (mostly over 20%, except for DE) is under Natura 2000 protection (PL, SI, RO). In this group of countries, there is a strong focus on both multifunctional/close-to-nature forestry and wood production. In Germany, forest governance and management are characterised by two main poles. On

the one hand, a focus is put on close-to-nature forest management (partly legally required for public forestry since the 1990s, rooted back into discussions since the late 19th century), and multifunctionality has been promoted politically as a management paradigm since the 1950s (Pistorious et al. 2012). On the other hand, there is a substantial share of even-aged conifer plantations that are increasingly affected by climate change-induced disturbances. In Germany, in 2022, 26.6 million cubic meters of damaged timber were felled due to insect damage. This corresponds to a share of 59.5% of the logging of 44.7 million cubic meters due to forest damage. The share has increased significantly since 2018, reaching a preliminary peak of 81.4% in 2021.” (Statistisches Bundesamt 2023). Similar challenges, specifically with spruce plantations/forests, can be observed in other Central and Eastern European countries. In Slovenia, there is also a long tradition of sustainable forest management and close to nature forestry, and an ecosystem approach to forest management has been implemented since the 19th century (Slovenian Forest Service, 2008). In PL, multifunctional sustainable forest management has been the main paradigm since 1991 and, since the introduction of the Forest Act (1991), there have been attempts to adjust the forest management guidelines and make the management more socially inclusive and pro-ecological (Rykowski 2020).

Forest policymaking in all these countries aims at strengthening the resilience of forests to climate change and diseases. In RO, in response to the threat of illegal logging and ongoing risks, one key national political priority is expanding forest cover and aligning forest and environmental regulation to evolve towards new command-and-control mechanisms (Vasile and Iordachescu 2022).

Southern Europe exemplified by Italy and Spain (+ three regions)

This country group is characterised by a relative lower contribution of the forest sector (less than 1%) to the national economy and an increased risk of forest fires and climate change-driven disturbances (such as windstorms and droughts), and often encounters a limited level of forest management. In both countries, domestic forestry is not able to satisfy the domestic industrial demand for wood, and Italy is a net importer of wood and wood-based products (80% of the wood used by industry is imported from other countries).

Continuous forest cover management and selective cutting practices are dominating, except for some plantation areas. With an increasing risk of forest fires and an expansion of forest cover due to the abandonment of traditional rural activities (Frei et al. 2022), these countries are striving to mobilise more wood and increase the added value of products as they aim to promote multifunctionality and make their ecosystems more resilient. Nowadays, timber production is well under the growth rate allowance and, depending on the regions, more than 60–80% of the harvested wood goes toward wood energy (firewood and wood chips). The Mediterranean forests are playing a fundamental role in providing a vast range of other ecosystem services, including non-wood forest products (NWFP) and biodiversity protection. In both countries, a relatively high percentage of surface is already classified under the Natura 2000 and/or other protection regimes, with over 30% in Spain (including Catalonia and Andalusia), and around 20% in Italy. The main forest-related goals focus on climate adaptation (including effective fire management and carbon sequestration) and the promotion of a bioeconomy and biomass use. In Italy, maintaining a rural economy and forest restoration, especially in urban areas, are also important. There is also significant societal use of forests (e.g. for recreation), while at the same time forests play an important part in pastoral and other rural activities.

Western Europe (including the “Atlantic Rim”) exemplified by the Netherlands and Ireland

This group encompasses countries with low forest cover (each with 11% forest cover) and low contribution of forest to the national economy (less than 0.50%). However, the two countries differ in focus. In the Netherlands, nature/biodiversity and recreation are very important, with relatively less focus on wood



production, whereas in Ireland wood production is considered to be as important as biodiversity and recreation. In the case of Ireland, wood production normally involves plantations to supply the pulp and paper industry; in the Netherlands wood production is part of its so-called integrated forest management approach, which aims at an integration of the three main forest functions (wood production, nature and recreation – 'multiple use') at a small scale, using mainly natural processes.

Both countries encourage increasing the surface and the quality of forests and increasing climate resilience. In these countries, more dialogue and implementation planning are in coherence with the EU Forest Strategy. The NL also puts a substantial focus on the country's role as consumer of forest products, which is reflected in the high export/import value of forest products creating important markets.

2.3 Methods

This study applied mixed methods based on comparative content analysis. Specifically, a total of 221 policy documents were analysed. Additionally, 69 semi-structured expert interviews, based on a common set of interview questions translated into national languages, were conducted.

The nationally and regionally collected policy documents from the 15 countries encompassed laws or policy plans and strategies written by public authorities to capture recent policy developments in a policy area (e.g. Forest; Nature/Biodiversity; Climate Change (adaptation and mitigation)), but also respective documents relating to energy; bioeconomy and rural development that impact directly or indirectly the use of forests (See Supplementary Materials, downloadable from <https://doi.org/10.36333/fs15>).

Key experts were selected according to their national and regional forest and forest-related policymaking expertise and institutional background. The final interviewee list (see Supplementary Materials / Annex 3) comprises experts from public administration, NGOs, research and associations (including forest owners and outdoor recreation). Although diversity of opinion was pursued, the biggest share of interviewees represented public administration. This focus on public experts is partially explained by the nature of the assignment, which aimed for deep insights into forest policy priorities in countries, along with controversies and factors that might enable or hinder meeting the EU Forest Strategy's targets.

The data analysis followed a three step-approach.

Step 1: a content analysis of the policy documents was done according to a two sub-step approach: first, a list of codes reflecting the goals and actions from the EU Forest Strategy was developed, then these codes were used to analyse the country/regional documents. The measures that did not fit in this first round of coding were subsequently coded in an inductive manner, allowing national actions to emerge at the same level as the codes from the EU Forest Strategy. In this way, no hierarchy in the policy analysis was implemented (see Supplementary Materials / Annex 2 for list of codes derived from EU Forest Strategy and bottom-up coding). From this first step, main objectives, synergies, conflicts and policy instruments or measures for all different countries and regions were identified. This analysis was not meant to be a quantitative analysis but provides a good proxy of what could be prominent in policy implementation at national and regional levels. Likewise, gaps in policy measures in relation to the EU Forest Strategy detected through the document analysis were noted and were discussed subsequently in the interviews to capture the newest developments, in particular policy areas. In other cases (AT) data triangulation and relevant information were gathered through participation and interaction with experts in relevant policy processes (e.g., Forest Europe).

Step 2: the analysis of key expert interviews produced summaries that were compared vis-à-vis other country assessments and document analysis performed by step one.

Step 3: the authors held a workshop to make a comparative assessment of the material. We compiled country summaries based on the document analysis and the expert interviews. Key points addressed in the summaries included 1) policy alignments/gaps with the EU Forest Strategy, 2) policy goals, priorities and controversies, and 3) key messages and policy recommendations. These summaries served as the basis for a workshop where reoccurring themes between the countries were identified, but also cases that were seemingly unique.

While considerable effort was invested in both document analysis and interviews, it must be noted that that the situations in the different countries are diverse, as were the views of several of the interviewees. Furthermore, the EU Forest Strategy implementation process is only in its starting phase. This also means that, while this study can generate a general picture on forest policy across the studied countries in response to new EU priorities, it should not be read as a detailed report or fully fledged implementation study of the EU Forest Strategy.



3 Cross-case comparison on forest policy goals and measures addressed in the New EU Forestry Strategy 2030: synergies and gaps

The EU Forest Strategy aims to improve the quality and quantity of EU forests, enhance their multifunctionality and resilience, and address challenges linked to the increasing strain on forests through human activities and natural processes, including climate change and its negative impacts on forests. To achieve this, the Strategy is built on a range of pillars, or priorities, including:

- supporting the socio-economic functions of forests for thriving rural areas and boosting forest-based bioeconomy within sustainability boundaries
- protecting, restoring and enlarging EU's forests to combat climate change, reverse biodiversity loss and ensure resilient and multifunctional forest ecosystems
- strategic forest monitoring, reporting and data collection
- a strong research and innovation agenda to improve knowledge on forests.

Comparing the EU Forest Strategy priorities with national priorities (plus three regional ones for Spain), we identified certain topics to illustrate to what extent the policy measures of the selected countries are aligned with the EU Forest Strategy, and where shortcomings emerge.

In this chapter, we highlight opportunities for further coordination and integration between existing national objectives and EU forest policy goals. We also identify gaps. Gaps do not necessarily mean that the specific topic is completely absent from the forest policy of a country; it suggests that an issue is not explicitly addressed in the documents selected for analysis. Hence, expert judgement and interviews were used to complement the analysis.

This chapter is structured across the four main goals of the EU Forest Strategy (see Table 1):

1. Bioeconomy within sustainability boundaries: Measures to enhance the socio-economic functions of forests (Table 3)
2. Protecting, restoring, and enlarging EU's forests (Table 4)
3. Strategic forest monitoring, reporting and data collection (Table 5)
4. Dialogue and stakeholder engagement.

Finally, not only are the measures of the EU Forest Strategy presented, but also other national and regional measures that emerged from the document analysis.

3.1 Bioeconomy within sustainability boundaries: measures to enhance the socio-economic functions of forests

The main measures of the EU Forest Strategy to support socio-economic forest functions are summarized in Table 3. It shows which countries offer recurrent or prominent measures in their policy documents and legislation.

Table 3. Summary table of countries and regions with different representation on measures pursuing the goal of enhancing the socio-economic functions of the forests

Measures from the EU Forest Strategy	Countries with recurrent or prominent measures in documents
Promoting long-life products (e.g., use of wood for buildings)	AT, DE, FI, LT, NL, NO, RO, SE, SI
Ensuring sustainability standards (limits, methodologies, ensuring thresholds)	AT, CZ, DE, ES (including three regions), FI, IE, IT, LT, NL, NO, PL, RO, SE, SI, SK
Sharing information on best forest-relevant practices	AT, DE, FI, NL, NO, SE
Certification and market labels (for products in PAs)	none
Collaboration and promotion of eco-tourism	NL
Development of new skills and employment opportunities and education	AT, ES- PVQ, FI, IT, NL, NO, SI
*Production and support of biomass	AT, DE, ES (including three regions), FI, IE, IT, SI
*Support and creation of associations, businesses and cooperation	AT, CZ, ES (including three regions), FI, IT, SI

* These measures are not considered in the EU Forest Strategy but emerged from some of the national and regional documents analysis.

3.1.1 Promoting long-life products

The overall effect on climate change and the socio-economic performance of the forest sector lies in the way harvested wood is used. Once the wood is harvested, a significant amount of carbon is removed from the forest and can then be stored for decades in long-life wood products such as wooden houses, furniture, decorative elements or kitchen accessories. Substitution effects depend on the type of wood product, the type of non-wood product that it is a substitute for, production technology and efficiency, as well as the end-of-life management of both wood- and non-wood products (Verkerk et al. 2022). However, despite broad scientific consensus on the potential to reduce lifecycle environmental impacts in the construction sector by using wood instead of steel and concrete, it remains difficult to determine the substitution effect in other cases (Olsson et al. 2017).

Central to bioeconomy endeavours is the objective to promote long-life products and superior wood valorisation and/or cascading wood. The EU Forest Strategy highlights that sustainably produced and long-lived wood-based products can help to achieve climate neutrality by storing carbon and substituting fossil-based materials, in particular through their embodied carbon add. The construction sector is highly relevant to this discussion. The EU Forest Strategy mentions that, following the New European Bauhaus initiative, research and innovation on architecture, green design and construction materials should be amplified, including industrial improvements to use more low-grade wood, especially from hardwood species, and how to enhance cascading use and increase circularity.

The analysis showed that many of the investigated policy strategies, especially those focused on bioeconomy or wood use, highlight the **importance of long-life products and cascading use**. Nordic countries (such as FI, SE) highlight cascading and long-life products within the context of their strong wood-construction sector. Others, such as AT, have a dedicated strategy to strengthen the role of wood construction. The WoodPoP initiative (European Wood Policy Platform) created by FI and AT is one activity where like-minded countries across the EU promote the use of wood in construction and long-life products.



Yet, promoting long-life products also emerges as a strategic priority and target in other countries (such as LT, NL, SI) or, at least if not dominant yet, is explicitly mentioned in new policy documents (such as in DE, CZ, ES (including three regions), IE, IT, RO, PL, SK). For instance, in SI, to increase the competitiveness of the entire forest-wood chain, an action plan, “Wood is beautiful”, has been adopted. The document defines wood as a strategic raw material, which has a lot of unexploited potential. In PL, wood is addressed by the National Environmental Policy 2030 in the form of the strategic project “Combating climate change – Wooden buildings”, aiming to increase the use of wood in the construction sector (particularly for housing for individuals with moderate income) through improving the conditions for the development of wooden buildings and stimulate demand for ecological construction.

3.1.2 Ensuring sustainability standards, certification and labels

Sustainable timber production is presented as a win-win solution in the EU Forest Strategy, providing sustainable raw wood and non-wood materials, and products needed for transition to climate neutrality, among other functions such as biodiversity, or the carbon sink function.

The analysis showed that **sustainable timber production** is among the prevailing objectives clearly highlighted across several of the analysed policy documents. Naturally, productivity objectives may differ from country to country depending on the available timber or the need to preserve carbon stocks and meet ecological prerequisites. While wood production is already prominent in forest policies in some countries (e.g., ES-PVQ, IE, FI, LT, RO, SE, SI), in other countries (e.g., PL, RO, SK) pressure on forest resources to also satisfy other productivity needs is seen as increasing. One example is the use of wood for energy under the narrative of the coal phase-out, energy crisis and the Ukraine war (e.g., PL, RO, SK).

Forest certification is a frequently referred to policy instrument, which is meant to promote the sustainability of forest management. The two well-known market-based certification schemes – FSC and PEFC – are present in all countries, certifying both chain of custody and forest management. Many of the studied countries' forest action plans or legal documents referring to **multifunctional forestry** (i.e., implying timber production as well as using non-timber forest products and ecosystem services – Martynova et al. 2021) present this type of forestry as an integral part of sustainability (e.g., AT, CZ, DE, FI, IT, LT, NL, NO, PL, RO, SE, SI, SK). However, while SFM and multifunctionality are identified in the policy documents, it is often difficult to assess its implementation in practice.

With regards to **forest certification**, FSC and PEFC certified areas are used as indicators of SFM and biodiversity protection in some countries (e.g., IT). However, controversial discussions around certification have emerged. For example, in 2022, in PL, three regional directorates of the National Forest Holding “State Forests” left the FSC certification scheme, pointing to several issues and concerns about the certification system and the process of agreeing on the national standard for it. In the Netherlands, research showed that certification costs time and money, with a low demand for certified products and no additional financial return, and hence is only considered effective in terms of a “marketing tool” or a “social license to operate” (Buytendijk BV and St Bewust met Hout/Green deal 2015). Several Dutch forest owners also decided to leave the FSC certification scheme.

Other certification standards and sustainability criteria were identified in some of the countries. In NL, for example, in order to guarantee quality in the management, organisation and administration of nature areas (including forests), a certification system has been developed, which is compulsory for those applying for management subsidies for forest and nature. In order to comply with the EU ETS obligation, the Netherlands is also working on a (temporary) sustainability system for 2023; on 1 January 2024 a final system is expected to start. In SK and the CZ, a focus on certification seems to be lacking in the documents, even though the certification schemes are quite well developed.

In contrast to the well-developed certification systems in the wood products market, **certification and market labels for products in protected areas** are not present in any of the studied countries. Here, there is still a lot of scope for forest product labels in protected areas as with other certification systems operating, for instance, for agricultural products.

3.1.3 New skills and employment opportunities – including the promotion of ecotourism

The Commission's Joint Research Centre estimates that around 517.4k people are employed in the EU forest-ry sector, adding a value of 25 billion Euros to the European economy (Tamošiunas et al 2022). Developing a forest bioeconomy is expected to create additional jobs in the forest sector. These may include both conventional forest production and processing of wood, as well as newly emerging sectors, including a wider range of niche wood production, wood-based energy and ecosystem services such as recreation and tourism (FAO / UNECE 2018). Workforce diversification remains a key concern in the forest-based bioeconomy and should be addressed in education, recruitment and training (Lawrence et al. 2017). Therefore, some European universities have included the bioeconomy in high-level educational programmes, such as MSc courses (Masiero et al. 2020).

Accordingly, the analysis has shown that calls for the **development of new skills and employment** in the forest-based sector and a transition to the production of sustainable energy (FI, IT, NL, NO, SI) are linked to bioeconomy strategies, including forest action plans. Rural development remains an important objective highlighted in the forest policy strategies of several countries around Europe, albeit not always mentioned in the context of the bioeconomy. This usually involves creating job opportunities in forestry and thereby supporting rural development (e.g., by enhancing salaries, social recognition, ensuring work safety, and providing additional opportunities for qualification, etc.) (e.g., AT, CZ, ES and CAT/PQV, FI, IT, NO, RO, SI, SK).

New green jobs opportunities go beyond traditional primary sector (production) occupations and refer to different forest ecosystem services management. In addition, this also brings increased competitiveness to the forest sector, sustainable management of natural resources, and support for climate change adaptation measures. The vision behind this is to create a base for a modern rural bioeconomy that supports all forest ecosystem services and promotes local and regional development by creating a space for bioeconomy pilot activities for small and medium rural enterprises (CZ, SK). For instance, forests can contribute to rural development as an alternative source of income through the promotion of ecotourism or nature-based tourism built on cultural services.

The EU Forest Strategy suggests that alternative sources of income through **ecotourism** should be created through a collaboration between forest managers and the tourism industry.

Although many of the countries analysed explicitly address ecotourism in their forest or forest-related policy documents (e.g., FI, SE, SI), only in the Netherlands is this topic really prominent. Faced with high recreational pressure due to the small amount of forests present, sustainable tourism and nature inclusive recreation is high on the Dutch policy agenda. In other countries, ecotourism is either not addressed (e.g., CZ, ES, SK) or only implicitly addressed, i.e., it is related to the promotion of cultural or social ecosystem services (e.g., DE, IT, RO, PL). However, we have not included strategic documents from the tourism sector in the analysis, hence our findings should be interpreted with caution here.

Nature-based tourism refers to outdoor leisure activities, where people engage with nature, such as in forests or in/close to national parks. The activities are based on the sites' natural qualities. These activities are often conducted with minimum involvement of commercial or professional operators, for example,



hiking in the forest, or collecting berries or mushrooms for personal consumption. According to the latest research available forest-rich countries offer high potential for nature-based tourism (Tyrväinen et al. 2017), but nature-based recreation and tourism are also important in countries with a low forest cover. However, there is an increasing trend of professional service delivery, driven by, for instance, technology (e.g., mobile applications) and a thriving outdoor retail industry. This generates favourable conditions for business innovation (Haukeland et al. 2023).

3.1.4 Additional measures addressed

Two categories of measures were recurrent in the policy documents analysed, which were distinct from the goals and related actions from the EU Forest Strategy (Table 1). In many countries (e.g., AT, DE, ES including three regions, FI, IT, SI) we found measures supporting the **production of biomass for bioenergy**. However, the role of wood as source of bioenergy is still highly debated, in particular with regard to the use of roundwood on industrial scale (e.g., RO), while consumption often relates to low-quality assortments, non-commercial roundwood, but also to the associated risks of air pollution (e.g., IT). Last but not least, it can also play a role in reducing biomass in fire-prone forests in Southern Europe.

Alongside the goal of enhancing forest's socio-economic functions, recurrent measures were **supporting the creation of associations and businesses** (e.g., biomass clusters, bioeconomy hubs, producer groups, etc) (e.g., AT, CZ, ES including three regions, FI, IT, SI). Moreover, cooperation is also pursued for conservation purposes as means of strengthening the social values of third sector entities through public-private collaborations.

3.2 Protecting, restoring and enlarging the EU's forests

Table 4 summarises the main related measures of the EU Forest strategy and shows which countries offer recurrent or prominent measures in their policy documents and legislations.

Table 4. Summary table of cases with different representation on measures pursuing the goal of enhancing the regulatory functions of the forests and biodiversity

Measures from the EU forest strategy	Countries with recurrent or prominent measures in documents
Afforestation and planting trees	IE, IT, LT, NL, PL, RO
Sharing information of best relevant climate adaptation practices	AT, DE, ES (including three regions), FI, NL, NO, PL, SK
Increase the uptake of rural development funding / EU / national level	ES (including three regions), IE, NL, SK
Advances in supporting PES (technical guidelines, sources of financing)	CZ, DE, ES- CAT FI, NL, RO
New regulatory framework on restoration	NL
Guidelines on definition and protection of old-growth forest	IE, NO, RO
New legislative frameworks and administration procedures and structures	CZ, DE, ES-CAT, RO, SI
New fiscal tools: taxation, funds, subsidies	CZ, DE, ES (including three regions), IR, FI, SE, SI
Creation of green infrastructures	ES-AND, IT, LT, RO

* These measures are not considered in the EU Forest Strategy but emerged from some of the national and regional documents analysis. In IE, the focus is on native forests, which includes the remaining old-growth forests.

3.2.1 Afforestation and planting trees

The EU Forest Strategy focuses on sustainable reforestation and afforestation and is accompanied by a roadmap for planting at least three billion additional trees in the EU by 2030. The Commission also aims to develop guidelines on biodiversity-friendly afforestation and reforestation.

Promoting **afforestation** and **planting trees** repeatedly appeared in the policy documents of multiple countries. In general, afforestation is understood as a process of planting trees in an area where there was previously no forest, either on degraded or agricultural land. Promoting afforestation is clearly highlighted in the strategies of some countries (e.g., CZ, IE, IT, LT, NL, PL, RO); for some countries this can be considered part of traditional forest policy, for others it is new (e.g., NL). In NL, where afforestation is a new development after having witnessed a decrease in forest cover due to conversion of forests over the last decades, planting trees is high on the political agenda (aiming to increase the forest cover by 10%). In PL, these measures are particularly supported within agricultural policies in the form of economic instruments for creating and maintaining agro-forestry systems, mid-field woodlots and forests. In IT, they are focused on urban and peri-urban areas.

The reasons for pursuing afforestation or planting trees highlighted in these policy documents are manifold: carbon sequestration, biodiversity, soil conservation, climate regulation, water cycle, recreational and other cultural as well as economic benefits. However, despite these benefits, afforestation or planting more trees remains a controversial issue which not all countries in this study support. At times, the promotion of afforestation includes discussion about which type of tree and for which purposes: the focus on the planting trees issue varies from native trees only to production-oriented trees, and from afforestation as carbon stock and investment (e.g., IE) to the establishment of green infrastructures (e.g., ES, LT, RO), especially in urban and peri-urban contexts (IT), and restoration (e.g., DE, RO). The **creation of new green infrastructure** includes a wide variety of instruments to increase ecological connectivity and restoration, supporting the network of protected areas (e.g., ES-AND, IT, LT, RO).

3.2.2 Sharing information about best relevant climate adaptation practices

Strengthening the resilience of EU forests is an important objective highlighted repeatedly throughout the EU forest strategy. Under increasing climatic threats, the concept of forest resilience is more relevant than ever. However, resilience may relate to different types of disturbances. Depending on the biogeographical specific vulnerabilities and how they are addressed in the national strategies, forest resilience refers to the ability of a forest ecosystem to withstand and recover from fires, pests and bark beetle attacks, storms, droughts and more in general climate change. Such disturbance events are increasingly challenging traditional responses to outbreaks and, in some cases, efforts to manage outbreaks have led to social unrest and political instability (Hlásny et al. 2021).

The analysis showed that **measures to share information** about best relevant climate adaptation practices as a means to promote knowledge exchange and good practice on climate adaptation and resilience appear strongly in policy documents in several cases (e.g., AT, DE, ES, FI, NL, NO). For instance, AT and DE have set up forest funding packages to support forest climate change adaptation and strengthen the forest sector and research. In the NL, for example, knowledge exchange, including on climate smart forest management, is an explicit aim in the policy documents. One of the tools to do this is the toolkit Climate Smart Forest and Nature Management. It provides Dutch managers of forest, nature and landscape with tools to implement climate-smart forest and nature management measures and is continuously updated. In IT, the information sharing and technology transfer measures refer to several different fields of action, not only focusing on climate adaptation practices.



Bark beetle outbreaks have reached unprecedented levels in conifer forests in parts of Europe (e.g., CZ, DE, IT, SE, SI) and are expected to further intensify due to climate change. **Different approaches to increase the resilience of forests** to different disturbances are mentioned in the national acts and policy instruments. These may include reducing the risk of wildfires through prescribed burning or thinning, protecting against invasive species (e.g., ES, IT), adapted tree-species selection for replanting, protecting the existing biodiversity (e.g., IT, RO, SI), increasing the stand stability against windfall (RO) as well as against other biotic and abiotic disturbances (IT), or promoting the natural regeneration of the forest (e.g., RO, SI). In the Netherlands, creating a vital forest is one of the main points of the Dutch Forest Strategy, describing a quality impulse towards forests that are more complete (i.e., including all ages) and more diverse (i.e., a range of species). This should result in forests that are more resilient to weather extremes. The main national forestry documents of SK and CZ contain very similar visions for increasing the biodiversity and ecological stability of forest ecosystems, while also not neglecting production functions, through diversified forests that are more resilient to climate change and able to mitigate its impacts. In SE, concerns about forest damage and the risks due to climate change led in 2021 to a governmental allocation of SEK 60 million (€6 million) annually for research and development to mitigate forest damage. Similar programming took place in AT. In DE, the government has made €900 million available to support forest owners in adapting their forests to climate change. In Italy, there is a growing concern among the population (and therefore politicians) that forests are fragile and unstable.

Furthermore, **ecological preconditions and management legacies play a role**: if natural regeneration is already practiced in the country as a current management measure, (e.g., ES, in RO less than 8% of the stands are planted – NFI 2022), the national strategy will rarely introduce new instruments in favour of natural regeneration, unless they are introduced to support established practices (e.g., DE).

3.2.3 Increase the uptake of rural development funding and supporting payments for ecosystem services

The EU Forest Strategy stresses that the multiple benefits of forests and their interdependencies need to be further addressed in an interdisciplinary and integrative manner, with the aim of adding more value to sustainable and multifunctional forests and maximising their benefits for society.

The analysis showed that many national forest strategies address **forest ecosystem services**, albeit in different ways. Although multiple forest benefits are frequently highlighted, only a selection of these benefits (biodiversity, carbon sequestration, water and soil quality, timber production) are referred to specifically, and this to varying degrees. Some countries (e.g., AT, ES (including three regions), IT, LT, RO) follow decades of experience in strategic forest management, where various forest ecosystem services are promoted in different areas. In such cases, forest management planning decides on the prevailing service provisioned simultaneously with naturalness, biodiversity, soil protection, social role, water protection, climate change mitigation and timber production. In countries following a strong command-and-control approach (e.g., LT and RO), forestland zoning enforces stringent regimes in both public and private forests. In other countries (e.g., AT, DE, ES) forest owners' objectives take priority irrespective of assigned functional priority. In IE, the creation of new native woodland and conversion of conifer forest to native woodland are considered the appropriate measures for delivering wider ecosystem services relating to the protection and enhancement of both biodiversity conservation and water quality.

The EU Forest Strategy acknowledges that good examples of public and private payment schemes for ecosystem services already exist (e.g., protection of drinking water, carbon sequestration, biodiversity conservation). It also highlights that options for the further development of public and private markets for the provision of forest ecosystem services are being explored for deployment with EU research support. **Payment**

of ecosystem services (PES) are highlighted by some countries (e.g., CZ, DE, IT, NL, PL, RO, SI). For instance, in SI, since 2017, financial means from the Forest Fund (budgetary fund) have been allocated for the application of Natura 2000 measures to private forests. Countries such as CZ and RO highlight their importance, but also raise the issue of (lacking) new or alternative fiscal tools. Some countries (e.g., FI, SE) have several decades of experience with nature conservation agreements, while others (e.g., ES-CAT, RO, SI) are experimenting with approaches, such as classical compensations for income loss in strictly protected forests where harvesting is not allowed, or exploring new revenue models, such as the integration of forests into business management of farmers and voluntary carbon certificates in NL. In other cases, while the use of PES is explicitly mentioned, they appear not to be implemented on the ground or insufficiently funded (e.g., IT, LT, PL). A different approach is taken by the forest trust fund in NO, which is a mandatory requirement for forest owners to set aside a certain share of their timber sales for investment in their forest for the future. A similar instrument also exists in RO.

Water and soil protection functions are central to forest resilience and protective forest functions. They appear in the strategies of many of the countries investigated here. Often forests are considered in relation to water management policies (e.g., CZ, DE, ES-CAT, IE, IT, PL, RO, SI, SK). For instance, in DE the federal water legislation entitles forest owners to receive compensation payments for management restrictions in groundwater protection areas. In PL, forest water retention programmes were listed in the National Environmental Policy for 2030 as implementation measures for adaptation of forests and forestry to climate change carried out by the National State Forest Holding “State Forests”. Next to the protection function (erosion prevention) (IT), the management of water in forests is linked to the adaptation of forests and forestry to climate change and interlinked challenges (e.g., AT, ES-CAT, PL, SI).

Economic incentives for cultural ecosystem services are also in place in some countries. In SE, it is possible to obtain subsidies for enhancing/preserving environmental and cultural values, such as cultural remnants in forests. In other countries (e.g., ES, IT), this is possible through the RDP measures. The Finnish Landscape and Recreation Value Trade compensates forest owners for providing recreational services in their forests. In NL, forest owners can only receive management subsidies on the condition their forests are open for recreation for most of the year. In DE, the formal regulation of open access to all types of forests (everyone’s access right) in the Federal Forest Law in the 1970s was linked back to financial support for forest management in return. On the other hand, in countries such as SK or CZ, support for cultural and environmental forest ecosystem services is provided through forest policy instruments, as market mechanisms for supporting FES are rare. Support for FES is also sporadic in RO. Here only few compensation schemes exist, while FES delivering is targeted for by the forest zoning system established through forest management plans.

3.2.4 Old-growth forests

The EU Biodiversity Strategy proposes an overall target to protect at least 30% of the EU land area under an effective management regime, out of which 10% of the EU land should be put under strict legal protection. The EU Forest Strategy confirms this target. Existing primary and old-growth forests (around 3% of EU forested land) provide high ecological and/or cultural values and are also linked to many of the objectives discussed above, especially considering their role as significant carbon stocks and high importance for biodiversity and the provision of critical ecosystem services. According to available scientific research (O’Brien et al. 2021), many different and often competing terms are used across Europe to describe ‘old-growth forests’. Depending on the definition applied, old-growth forests would cover a larger area than only ‘primary forests relicts’, expanding to “natural high conservation value forests with low levels of human influence” (O’Brien et al. 2021, p16). The EU Forest Strategy acknowledges this dilemma and recognises the need to find a common definition, as well as map and establish a protection regime for primary and old-growth forests. Only



recently (after data collection for this study had finished), has a preliminary working document addressing these issues been released (COM 2023). However, there is still no unified definition of old-growth forests, nor legislative mechanisms (at least at the EU level) to ensure their protection, a situation which is seen as contributing to their decline (Mikolas et al. 2023). Scientists (Mikolas et al. 2023) argue that old-growth forests are at risk of being harvested before being identified in European countries.

The analysis showed that the **importance of protecting such ecosystems** is highlighted in the national policy strategies and laws of many countries (e.g., IT, NO, RO, SI). However, in practice, a gap was identified in some countries (e.g., ES, FI, SE, SK) regarding references to old-growth forests in the analysed policy documents. Old-growth forests are also not identified systematically and classified as forest reserves, and therefore could be harvested according to forest management plans (e.g., ES, FI, PL, RO, SE), or they may be subject to illegal logging (e.g., RO). In some cases where old-growth forest was mentioned, actions seem focused mainly on specific components (e.g., monumental trees in IT) and the first planned actions refer to the identification and mapping (create a census) of these ecosystems.

The **lack of reference** could be related to the fact that – if a stricter definition is applied – old-growth forests are rare in Europe and are not considered to be present in some of the investigated countries. Linked to this, the lack of references could also be rooted in a lack of ambition to resolve the ambiguity around the definition of old-growth forests. In NL, for instance, the strict protection of old-growth and old forests is considered important, but no definition or specific guidelines for old-growth forests are included yet, waiting for the developments on the European level. In other countries, defining and identifying old-growth forests is also reported by experts as a key action that needs to go hand in hand with financial support, and not excluding active management (e.g., ES-CAT, IT). This is in sharp contrast with some countries where criteria for identifying primary forests in view of their strict protection were enacted 10 years ago (RO), yet the RO definition of old-growth forestry holds a narrow interpretation of old-growth forests as being ‘undisturbed by man’.

3.3 Strategic forest monitoring, reporting and data collection and research

The main measures for strategic forest monitoring, reporting and research of the EU Forest strategy are summarised in Table 5. It shows which countries offer recurrent or prominent measures in their policy documents and legislations.

Table 5. Summary table of countries with different representation on measures pursuing the goal of enhancing the strategic forest monitoring, reporting and data collection.

Measures from the EU forest strategy	Countries with recurrent or prominent measures in documents
Existence of strategic plan for forest / Observatories	AT, DE, ES-PVQ, FI, IE, IT, LT, NL, RO, SE, SI
Reporting on the state of forests	AT, DE, ES-AND-PVQ, IE, FI, LT, NL, NO, PL, RO, SE, SI
Development of remote sensing products to monitor disturbances or climate change effects	AT, DE, LT RO, SE, SI,
Usage/promotion of citizen science	NL
Raising awareness and access to information	AT, CZ, ES (including three regions), IE, FI, IT, SI, SK

* These measures are not considered in the EU Forest Strategy but emerged from some of the national and regional documents analysis.

3.3.1 Existence of strategic plan for forest and observatories

The EU Forest Strategy raises the issue of patchy information concerning the status of forests in the EU and their social and economic value, as well as the pressures they face and the ecosystem services they provide. It also criticises the insufficient planning for EU forests, which could result in a situation where forests are not addressed in a coordinated manner and no comprehensive picture of the multifunctionality of forests in the EU was provided, especially regarding climate mitigation and adaptation, ecological condition of forests, forest damage prevention and control, and forest biomass demand and supply for different socio-economic purposes.

Although it is largely accepted that forests provide multiple environmental services, assessments of how forest management enhances ecosystem services' provision are scarce and fragmented, and so is the publicly available information. However there is a variation of quality and diversity of forest-related data among countries (Sotirov 2017) and a lack of a harmonised reporting system at EU level (eg. Lier et al. 2022).

Accordingly, the EU Forest Strategy aims to improve the Forest Information System for Europe (FISE) to serve as the main source of harmonised forest data in Europe. Additionally, the EU Observatory on deforestation, forest degradation, changes in the world's forest cover, and related factors will use Earth-Observation-based monitoring tools for forests and will be incorporated into FISE as part of an integrated forest monitoring system.

The analysis showed that **reporting on the state of forests/observatories** was mentioned as an important objective in the analysed forest policy documents of many countries (e.g., AT, DE, ES, FI, IE, IT, LT, NL, PL, RO). In the other countries, reporting on the state of forests is not mentioned in strategic documents; this might be because they have established long-term schemes (e.g., CZ, NO, SE, SK, SI). More than half of the instruments mentioned in relation to enhanced planning and monitoring focus on reporting the state of the forests/observatories at national or regional level. However, the **issue of interoperability of datasets and harmonisation of monitoring systems** to allow comparison between countries and regions is not sufficiently addressed in practice (e.g., IT, RO).

There is still a **lack of data availability** in some of the countries studied (e.g., IT, RO). Political factors such as reluctance to provide data that is seen as sensitive may play a role as well as the different capacities to monitor forests (e.g., ES, RO), or the absence of a commonly defined system (e.g., for DNA analysis of wildlife), which does not allow comparisons (e.g., IT).

With regard to **raising awareness and access to information**, communication of data (including to the general public) is not satisfactory and some countries (CZ, ES (including all three regions), IE, IT, RO, SI, SK) are already committed to enhancing their respective efforts. Confusion also exists because different sectorial policies affecting forests tend to frame forest-related information differently. This fact complicates **communication strategies**, as it remains a major challenge to provide forest-related information in a manner considered to be "objective" beyond different sectoral framings. Yet, recent research (Wilkes-Allemann et al. 2021) also shows that communication targeting one objective is more effective than multi-purpose messages with several objectives.

3.3.2 Reporting on the state of forests and development of remote sensing products to monitor disturbances or climate change effects

In its call to define a list of relevant parameters to harmonise EU monitoring, as well as collecting and reporting data, the important role digitalisation is stressed for forest monitoring and modelling, but also land use change and detecting illegal logging (e.g., Copernicus Sentinel data or products, artificial intelligence, satellite imagery).



Many national forest policy documents already address the need for **enhanced access to information and/or digitalisation** (DE, FI, RO, SI, SK). In FI, for example, the Finnish Forest Centre (Metsäkeskus) collects information on forest stock using remote sensing based on laser scanning. The collected data is updated with growth calculations and information on forest management activities. The Centre then uses this information to monitor implementation of the Forest Act and also provide advisory services to forest owners. In DE, the use of remote sensing, specifically satellite data, is promoted to improve data availability on the role of forests in mitigating climate change, as well as related to greenhouse gas (GHG) reporting in land use, land use change and forestry sectors.

Digitalisation is also present in many of the analysed strategies and policy documents, and it is often associated with better monitoring, new tools for forest monitoring, criteria and indicators (e.g., IT), or monitoring of wood harvesting and transport (e.g., RO). In contrast, the development of remote sensing products to monitor disturbances or climate change effects is missing in many countries (CZ, ES (including all three regions), IT, RO, NL, SI). In these contexts, many countries have well established national inventories (NI). The elaboration of indicators is conditioned to the quality and availability of data collected data through NI. Moreover, in some of these same countries (e.g., CZ, ES-PQV, FI, IT, NL, NO, SE, SK, SI), although remote sensing is not mentioned in strategic documents, it has been developed in recent years by public agencies or private consultants specifically for forest inventories and the monitoring of disturbances and climate change effects to better target management measures.

3.3.3 Citizen science engagement and raising awareness

Citizen engagement is an important tenet of the new EU Forest Strategy. Against the backdrop of strengthening the research and innovation agenda to improve knowledge on forests, the European Commission promises to develop a citizens' science programme for forest biodiversity, notably engaging citizens and civil society in monitoring forest biodiversity. The strategy also encourages citizens and communities to actively take part in implementing the pledge of planting at least three billion additional trees by 2030.

Engaging the public in the collection and analysis of data and information about a range of forestry issues, (e.g., in studies focused on plant and animal biodiversity, tree pests and diseases, or climate change effects on local landscapes) is seen as useful. Several successful initiatives have been initiated around Europe, yet despite the growing interest in this topic, it is **largely absent** from the analysed policy documents (e.g. IT, RO, SK). In NL, however, concepts such as "citizen initiatives" and "active citizenship" are important in terms of nature conservation and management. The research of Mattijssen (2019) even talks about many hundreds, maybe even several thousands, of citizen initiatives related to forests and nature in NL. These vary from initiatives in which citizens create and manage their own (tiny) forest or are actively involved in neighbourhood green initiatives or in education and monitoring (Mattijssen et al. 2018). Similarly, the Finnish Environment Institute highlights citizen science projects related to water management or winter monitoring. Another notable example is the access to timber traceability information granted to Romanian citizens through the electronic timber tracking system SUMAL. In the last two years, citizens accessed the SUMAL system 3.4 million times to check the legality of transported timber. A timber load not recorded in SUMAL is considered illegal, and everyone can freely interrogate the SUMAL application to check the existence of legal documents. There were 10.2 million transports recorded in SUMAL in the last two years, which means that, on average, every third load was checked by citizens.

In other countries (e.g., AT, CZ, ES (including three regions), IE, FI, IT, SI, SK) **citizens are engaged in other types** of measures. These are mostly connected to communication and promoting wider social participation across a different array of themes (e.g., in ES-AND raising awareness includes prevention of forest fires, social use of forest, conservation threats, climate change challenges, renewable energy and sustainable consumption

3.4 Participation and stakeholder engagement

The Commission encourages member states to establish broad multi-stakeholder dialogue platforms to discuss and inform European, national and local forest policies. The EU Forest Strategy mentions that such governance structures will allow a strengthening of dialogue between stakeholders, breaking silos and strengthening the synergies between rural development, a sustainable forest bioeconomy, and the EU's climate and biodiversity ambitions, in line with the EU Green Deal.

Dialogue and participation are present in many analysed countries. Some countries (e.g., AT, FI, NO, SI and SE) have a strong tradition of dialogue and participation, e.g., in the national and regional forest sector councils, and the ongoing process within the National Forest Programme. Others, such as IE, LT, RO and IT, have recently had the substantial inclusive processes of National Forest Agreement/Strategy development, where stakeholders made references to the EU Forest Strategy. In DE, the Future Dialogue on Forests was launched in July 2022, where forest stakeholders are given the opportunity to participate in the development of a new national forest strategy, following up on similar processes (National Forest Programme, Forest Strategy) in the past. In Slovenia, the Forest Dialogue was recently launched, which is an open, long-term dialogue process that monitors the process of forest management and is intended for all stakeholders in the field of forests and forestry. Within the framework of partner discussions, the Forest Dialogue provides an opportunity to exchange different viewpoints and reach agreements, assess problems and develop solutions to support sustainable forest management. In addition, the dialogue enables the integration of forest-policy-relevant thematic positions from different areas in so-called modules and thus a more effective treatment of current issues. Ireland has recently undertaken an extensive programme of public consultation to reform the regulation and vision for forestry in Ireland as part of the preparation of the new (Ireland) Forest Strategy to 2030 (Department of Agriculture, Food and the Marine 2022).

Interviewees in some of the countries included in this study reported that **forest owners are insufficiently included in decision-making processes at national levels** (e.g., CZ, DE, PL, RO, SI, SK), and in other countries they are perceived as having lower power and visibility with respect to other interests, such as those supported by the environmentalists (e.g., DE, IE, IT, LT, RO, SI, SK) or/and by forest/agricultural administrations (e.g., IE, LT, RO).

Even in countries with a strong tradition of participation, previous studies (Erkkilä et al. 2021) point out that younger generations of forest owners are less involved in decisions related to forest management. Despite legal opportunities or, in some cases, even legal requirements, societal organisations and public interest groups are not systematically included in forest-focused decision-making processes.

Forest management planning consultation is indeed present in many of the investigated policy documents, and consultations are reported to vary. They work well, for example in IT at the local level. In some countries, public participation is legally assured in forest management planning (e.g., ES, PL, SI). Again, in other countries, this requirement is prescribed in the forest management planning but is hardly or ineffectively implemented (e.g., RO). For example, in FI, private forest ownership is protected and public participation or hearing practices are not required in private land. In IE, on the other hand, hearing practices may delay the planned forest work by months or years.

The increased influence of EU policies on forests is not necessarily welcomed in every case by national policymakers or stakeholders. This can result in a lack of political will to align with certain policies (FI, SE), or even to go against or only pursue symbolic/formal implementation so that there is limited impact on the ground (e.g., impact assessment and planning – e.g., PL, RO). One notable effect observed in several countries (e.g., LT, RO, SE, PL) is the increasing polarisation of forest policy, while in others it is not the case (for example, NL). At times, this polarisation can result in small-scale forest owners (DE, IE, IT, RO) or



forest-dependent communities (where these still exist, RO) being sidelined. As a rule, groups mostly interested in cultural ecosystem services, as well as small-scale forest owners with a diversity of connections and interests in their forests, do not play a significant role at the national (and EU) policy levels – and if they do, it is mostly as a target group to be convinced to advance bioeconomy or biodiversity objectives.

4 Policy goals prioritisation and controversies, and enabling and hindering factors for meeting the EU's forestry goals

This chapter assesses possible underlying political drivers in shaping current and future policy developments. Specifically, it identifies the following aspects:

- main policy goals affecting forests and prioritisation among them
- main controversies related to multiple forest-related goals
- enabling and hindering factors in relation to meeting the EU's goals in the studied countries.

The results presented mainly draw on interviews with national experts addressing key questions in relation to goal priorities and meeting the EU's forestry goals.

4.1 Goal prioritisation across different forestry and forest-related policies

Establishing clear goals and policy targets is a precondition for successfully meeting the EU Forest Strategy goals. However, it is well known that in forest decision-making there are many sectoral goals and targets that affect forest use and management, in addition to creating trade-offs (Wolfslehner et al. 2020). As a result, different objectives affecting forests in sectorial strategies co-exist.

As a first step, a document analysis was done to examine the different measures pursued at national and regional levels (Chapter 3). However, policy prioritisation is an inherently political process and this form of analysis can only partly inform about controversies and prioritisation at national and regional levels and related policy dynamics. To capture these, expert interviews took place in all 15 countries and three Spanish regions and are summarised in Table 6.

It should be noted that the following descriptions provide additional insights into the ongoing policy dynamics that help with exploring the interactions with the EU Forest Strategy beyond the level of formal policy documents.

Results show **a lot of diversity between countries in relation to goal prioritisation**, and even between different regions within the same country (e.g., ES -CAT, AND, PVQ) while some overarching topics were also identified:

All countries and regional cases focus on the main forest policy objective to achieve **sustainable forest management and multifunctionality** (e.g., AT, CZ, DE, ES (including three regions), FI, IE, IT, LT, NO, PL, RO, SE, SI, SK) – while the understanding of these concepts differ widely. Beyond the multifunctionality paradigm, several countries directly address **how to achieve a balance between an active forest management (mostly oriented at wood production) and nature conservation** and in particular how to balance the expectations for nature conservation with the needs of forests owners/forest production (e.g., AT, DE, ES-CAT, CZ, FI, IE, SE, SI, SK); including trends (more or less consolidated) towards closer-to-nature silviculture (e.g., IE, DE, RO) or strict forest reserves (e.g., FI, LT, NO, RO, SE), and compensations and voluntary agreements with forest owners (e.g., ES-CAT, FI, IT, NO, RO, SE, SI).



Table 6. Forest and forest-related priorities as identified in expert interviews for the studied countries and regions

	Priority goals	Countries and regions (alphabetical order)
Enhancing socio-economic functions	Multifunctional forestry (including planning and active management)	AT, CZ, DE, ES (including three regions), FI, IE, IT, LT, NO, PL, RO, SE, SI, SK
	Balance between forestry and nature conservation	AT, CZ, DE, FI, NL, SE, SI, SK, RO
	Balance the expectation for conservation with the needs of forest owners	AT, CZ, DE, ES-CAT and PVQ, FI, SI, SE, SK
	Public use and cultural landscape (including hunting)	AT, ES-AND, IE, IT, LT, NL
	Wood harvesting and track logging	RO
	Secure development of rural areas to avoid depopulation and fragmentation	ES (including three regions), FI, IT, RO, SE, SI
Enhancing regulatory function and biodiversity	Bioeconomy (including): <ul style="list-style-type: none"> • increase forest harvesting • increase the efficient use of wood-based products • maintain the forest-wood value chain 	ES-PVQ, FI, IE, NL, SE, SI AT, DE, ES-CAT and ES- PVQ, FI, LT, (NL), NO, SI, SK FI, IT, NO, ES-PVQ, RO, SE, SI
	Adaptation to changing environmental conditions and protection to natural disasters	AT, CZ, ES (including three regions), FI, IT, NL, NO, RO, PL, SE, SI, SK
	Definition and protection of old-growth forests	ES-AND and -CAT, IE, LT, NO, RO, SE
	Planting/increase tree cover	IE, IT (in urban areas), LT, PL, RO, SK
	Restoration with new resilient tree species	DE, ES-PVQ
	Restoration of degraded forest	CZ, DE, IT, NL, RO
	Close to Nature forestry	CZ, DE, LT, SI, RO
Climate goals and role of forests in the green transition	IE, FI, LT, NL, NO, SE, SI, SK	
Stakeholder involvement	Increase citizen participation at local levels Increase social support at societal level	IE, IT, RO, NL

Despite a perceived **growing importance of cultural ecosystem services** (e.g., CZ, DE, ES, FI, IE, IT, NL, RO, SE, SK), the related public use of forests does not receive the same political attention when compared to bioeconomy, biodiversity and climate related targets, with the exception of densely populated and/or forest poor countries (ES-AND, IE, NL). An important point is to **recognise that Europe is mostly a cultural landscape** with millennia of human intervention history. Countries with a significant level of traditional activities, such as hunting (e.g., AT), or countries where cultural landscapes have been protected for decades through national laws that strictly regulate forest management (IT), stand out in this context. Likewise, despite the increasing evidence of the **positive relation between forests, human health and wellbeing**, this social dimension of forest is not yet considered a national and regional priority in relation to bioeconomy, biodiversity and climate related targets in most of the countries. In some cases, experts saw that activities that create income are more likely to be uplifted on the political agenda even though non-income-related activities are widespread in society.

In Mediterranean countries and regions specifically, the bioeconomy is seen as an opportunity to enhance **sustainable rural development**, and to create economic opportunities and jobs to reactivate rural areas and slow down trends on rural exodus (e.g., ES, IT).

Further **developing the bioeconomy** is another widely shared policy goal for forest management in several countries. Increasing forest harvesting and advancing/protecting wood value chains is envisaged in different biogeographical regions (e.g., ES (including CAT and PVQ), IE, FI, NO, RO, SE, SI). Moreover, the need for efficient use of wood-based products is voiced frequently across different biogeographical regions (e.g., AT, DE, ES (including CAT and PVQ), IE, IT, LT, NO, SI, SK).

Increasing forest resilience to changing environmental and climate conditions and protection from natural disasters (including pests, fires, storms) is salient in all countries.

Planting trees and increasing tree cover is set as a governmental priority in IE, LT, RO and NL, although the Dutch respondents considered other topics to be of higher priority in practice (e.g., vitalisation of forests, recreational pressure). Planting trees was also mentioned as a priority in PL and SK. However, in countries with high forest cover (e.g., AT, FI, NO, SE), afforestation is not a political priority. Similarly, for countries and regions with increasing forest cover due to rural areas abandonment, and related high risks of forest fires, this goal is not a priority (e.g., ES, including three regions), or it is a priority but only in urban and peri-urban areas (e.g., IT), or in regions especially sensitive to climate change (RO). Furthermore, in some countries, the question of how afforestation is done is also debated. In IE, for instance, combining afforestation policies and biodiversity conservation is sometimes considered difficult.

Partially related to afforestation, **restoration is a contested, not a univocally defined concept** in forest policy. For example, it is unclear how to define indicators or thresholds for forest restoration in the interplay between ecological integrity and the long history of human use and forest management (ES-PQV). Therefore, countries seem to await new policy developments at the European level before moving forward. Nevertheless, some countries have already put restoration into their policy agendas. In the context of restoration, interventions to improve the resilience and adaptation of forests to climate change are often a priority (e.g., AT, DE, FI, IE, IT, NL, SI, RO), but also biodiversity conservation and climate change mitigation measures.

SE, for example, does not prioritise **large-scale restoration** of production forests, but focuses on the restoration of drained peatlands (so-called rewetting) by means of a recently introduced subsidy. In FI, habitat restoration aims to restore a “natural state” of protected forests and mires, which were formerly used for forestry. IT also emphasises the connection between forest restoration and conservation. Others also emphasise responses to natural disturbances (including pests, fires, storms) (e.g., AT, CZ, DE, ES (including three regions), IT, NO, PL, SE, SI, SK), which are seen as increasingly urgent. In CZ, on the other hand, large-scale restoration is often preferred over the gradual process of close-to-nature silviculture.

Climate goals and role of forests in the green transition is mostly only set as a priority in countries where forestry is prominent or where their current priority is increasing forest cover (e.g., afforestation) (e.g., IE, FI, LT, NL, NO, SE, SI, SK), or in relation to specific contexts (e.g., urban areas – IT). As related research has shown (Winkel et al. 2011), climate change as a priority could increase synergies between different policy areas as it can act as a boundary object with some flexibility in the implementation of different actions – but it can also increase already pre-existing polarization.

The document analysis and the expert interviews showed that, so far, **increasing stakeholder engagement in policymaking** (including at local levels) is seen as a priority in fewer countries (e.g., IE, IT, RO, NL). **Collaborative approaches to policymaking** also include deliberative and inclusive co-creation of knowledge and sharing resources and information flows, which seems easier to implement at landscape level to maintain sustainability levels (e.g., ES-PQV, IT). In this context, past research has shown that tools such as multi-criteria



decision analysis (Saarikoski et al. 2013) and collaborative approaches to decision-making (Tikkanen et al. 2016; Böhling 2019; Lazdinis et al. 2019) can address conflicts at landscape level to some extent.

Dealing with different priorities is seen as challenging in most cases, and there seems to be a lack of mechanisms to deal with conflicts, which often remain based on ideological visions (e.g., IT). While past research (Winkel 2013) has found that priorities based on goals to tackle climate change can entail promoting bioeconomy measures – enhancing regulatory functions and biodiversity – policy responses may depend on path-dependencies based on the distinct characteristics of countries and their current dominant management systems (see Chapter 2) and policy decision-making characteristics.

From the interviews, we contrasted whether **mechanisms to identify and govern synergies and trade-offs between different policy options** (e.g., decision support systems) were considered to be a part of the policy system to reach compromise and avoid problem maximisation and to monitor the progress towards stated goals. Implementing instruments in regional and national planning has not been identified as a priority in documents analysed or in interviews. However, an overall need for policy harmonisation and coordination is often mentioned (e.g., IT).

4.2 Controversies between forest policy goals across cases

Table 7 describes different types of controversies (divergencies) between policy goals as defined at national level and supported by the dominant stakeholders' visions and current policies and regulations. The controversies have been identified by combining the literature review and the qualitative content analysis of experts' interviews in each of the 15 countries, and they are subsequently described in more depth.

Table 7. Typology of controversies between different policy goals and possible explanatory factors

Controversy between policy goals			Possible explanatory factors	Countries and regions (alphabetical order)
Wood production (included biomass)	vs	Biodiversity conservation	Ideological polarisation (and contested science) with different power of advocacy groups, different priorities at different policy levels (EU environmental agenda versus (some) countries' forest production agenda), insufficient alignment of policy goals and policy instruments (e.g., financial compensation to forest owners for production restrictions)	CZ, DE, ES-CAT, FI, IE, IT, LT, NL, NO, PL, RO, SE, SI, SK
Wood production	vs	Recreational use of forests	Increasing pressure for recreational uses, especially after the Covid-19 pandemic	AT, DE, IE, ES-CAT, FI, IT, PL, RO, SI
Wood production (including biomass)	vs	Carbon storage in forest and long-life timber products	Ideological polarisation and contested science, environmental effects (e.g., air pollution from burning biomasses)	DE, IT, FI, NL, NO, PL, SE, SI, SK
Nature/ biodiversity conservation	vs	Outdoor recreational activities	Increasing pressure for recreational uses, including hunting; risks of negative reciprocal impacts nature-people, especially in protected areas	AT, CZ, DE, ES – CAT, FI, IT, NL
Forest cover expansion (afforestation, new forests, tree planting)	vs	Agriculture, traditional landscapes and other land uses	Competing land uses (including urbanisation/infrastructures), competing for EU funds (e.g., RDP), other sectors dominant on forestry	CZ, DE, IE, IT, LT, NL, RO

Source: own elaboration based on literature review and interviews

4.2.1 Wood production vs biodiversity conservation

The **conflict between biodiversity conservation and wood production is a pattern to be found in all countries** but it varies in degree, confirming previous research (Beland Lindahl et al. 2023; Winkel et al. 2021; Sotirov et al. 2017). It seems especially polarised in countries where wood production is the main objective of a strong timber/pulp industry and supported by public policy (e.g., SE and FI and, to some extent, NO, PL, RO and ES-PQV) and/or where the conservation movement is strong and deeply rooted in society (e.g., NL) or more recently emerging (e.g., IT, RO).

In southern countries (where percentage of forest felling is less than 60% of net annual increment), controversies may be more on the conceptual/ideological level than relating to an intensive use of forests for wood production. In Central and Eastern Europe and the Mediterranean, this controversy also connects to forest disturbances (e.g., forest fires in Mediterranean countries, or bark beetle outbreaks in Central and Eastern Europe).

There are a few controversies that were prominent only in specific countries: e.g., afforestation interventions for climate purposes vs biodiversity protection in CZ; water-related ecosystem restoration along the rivers vs the need to keep the river slopes cleaned for hydrogeological protection in IT, peat land protection and restoration in FI and SE. In SK, interviews confirm that the cause of this controversy lies in different perceptions of forests between the forest and nature protection sectors. Based on that, different visions for forests and use of forest resources exist and create controversies. In FI, for example, harvesting is not subject to environmental or social impact assessments, and therefore may result in conflict if it has a negative influence on people's livelihoods or other economic sectors (e.g., tourism) or the environment. In ES (including all three regions) harvesting is always controlled by public administration and, in some cases (e.g., harvesting in Natura 2000 protected areas), is subject to strict environmental impact assessments and extra checks for special authorisations (e.g., IT). These processes should ensure that sustainable standards are met, but can also reinforce polarisation between different departments.

4.2.2 Wood production vs other forest ecosystem services

Tensions are found between provisioning ecosystem services in general (namely timber and biomass production still being predominant in forest management practices across Europe), and other regulating and cultural ecosystem services (carbon sequestration, protective functions, many social uses of forests, such as recreation, outdoor sports activities, hunting). Some of the experts interviewed would like understanding of forests' value to develop beyond timber production (e.g., FI, AT).

Recurrent controversies relate to policy goals such as **carbon storage in forests versus carbon storage in long-life timber products** (e.g., DE, FI, NO, PL, SE, SI, SK). The effectiveness of different climate mitigation strategies in terms of carbon storage have been passionately debated, with somewhat contradictory scientific evidence (chosen depending on the stakeholders' position) and undecided political positions. Environmental stakeholders usually prefer carbon storage in forests due to conservation benefits. Industrial actors emphasise carbon storage in products and the substitution effects since these favour intensive production (e.g., IE, FI, NO, SE).

Afforestation policies may lead to a gap between national forest policies and local land development policies, for example farmers using displaced pastures do not have the same amount of money available as investors (IE). The same structural problem of landowners' involvement and policy coordination between agriculture and forestry is also seen elsewhere, e.g., in RO, where the fate of 0.8 million ha of naturally established forests on former pastureland is unclear.



Another controversy emerges **between the consumption of woody biomasses for energy production and environmental protection** in terms of air quality and global sustainability (e.g., IT, NL). While the interviewed experts stated in some cases their preference for the use of wood for construction or other long-term applications vis-à-vis the use of low-value applications for woody biomass (e.g., ES including PQV and CAT, NL), achieving such use patterns might not be possible yet because of a lack of infrastructure. In Mediterranean countries, wood for energy production prevails. In relation to this controversy, official EU statistics in 2017 (Cazzaniga et al. 2021) shows that, overall, about 50% of the harvested wood is used for energy generation (firewood and wood chips), and experts report a higher percentage (e.g., 80%) in cases where statistics on this are weak (IT). Because of these controversies, the issue remains politically largely undecided because of the pressure from public opinion, and negatively influenced by the distorting financial incentives introduced in the past for large industrial plants for biomass-based energy production (IT).

Yet, synergies between policy objectives are also identified that are in line with recently published research (e.g., Beland Lindahl et al. 2023). For example, maintaining, growing and restoring forests as carbon storage for climate change mitigation is perceived as aligned with biodiversity protection goals. High value wood-based products mentioned as long-life storage of carbon and the possible (even if debated) use of woody biomasses as renewable sources of energy are perceived as synergistic with bioeconomy goals, and connected with rural development, employment, income diversification and national self-sufficiency (e.g., AT, DE, FI, IT, SE, SI).

4.2.3 Nature and biodiversity conservation vs outdoor recreational activities and other forest uses

An (often latent) controversy exists between the use of forests for biodiversity conservation and social uses of forests such as outdoor recreational activities. Particularly (but not exclusively) in protected areas, such as national parks, especially during and after the Covid-19 pandemic, an increasing number of visitors accessing forests were observed (AT, DE, ES (including three regions) NL, IT). Service providers and managers are facing a challenge to adjust to these new recreation demands with limited resources (Derks et al. 2020). While recreation patterns have largely returned to pre-Covid patterns, forest-based recreation remains popular in many countries and is frequently seen as beneficial for reconnecting people with nature and enhancing their health and wellbeing. For instance, the use of forests for human health and wellbeing, inclusion and green jobs creation is seen as generating positive physiological effects (e.g., Doimo et al. 2020; Mammadova et al. 2021). However, outdoor recreational activities can also have negative impacts on the natural environment. Heavy visitor use can lead to biodiversity loss and modified ecosystems as studies show (Winter et al., 2014). However, studies measuring the recreational impacts on protected areas (Buckley, 2003) do not yet reflect on this problematic side of recreational use.

There may be diverse societal responses to **rewilded forests** due to natural forest regrowth on abandoned agricultural lands, or abandoned management of previously managed forests, especially in marginal rural and mountainous areas, as well as the **reestablishment of previously rare or extinct animal species** such as predators (wolf, bear, wild boar). Rewilding and wild forests are often perceived as positive by urban visitors who are interested in wilderness-based recreation. In contrast, rewilding often conflicts with the views of nature predominant among rural populations or land users such as farmers, who are exposed to damage caused by wildlife and are not always adequately compensated, as evidenced by past research (Zoderer and Tasser 2021). They can also be seen as obstacles (e.g., infected ticks, increased number of bears/wolves etc.) to the tourism business on which many farmers in remote areas rely (e.g., IT, AT). With financial help, farmers in some countries increased their acceptance of predators (Hiedanpää et al. 2016), but the presence of bears and related human injuries remain a serious concern and a major cause of conflict in some countries (RO), while in others it is an emerging problem (IT). Furthermore, forest owners in several countries such as CZ,

AT and DE often consider high game densities to be a challenge for forest regeneration, resulting in conflict between hunting and forestry, and significant additional costs for forest management. The controversy between conservation and different recreational uses of forests also comes down to funding allocation (e.g., FI).

Related to the public use of forests, **private ownership is often unknown to people** as forests are perceived as being a public good. This reinforces potential conflicts between forest use and recreation (e.g., ES, FI, IT, RO). In these situations, recognising the role of forestry and traditional activities in the provision of cultural ecosystem services in rural economies, and increasing the understanding and respect for activities associated with primary production, could partially ease conflicts between recreation and other forest uses.

4.2.4 Forest cover expansion vs other land uses

Controversies also occur related to forest cover expansion and afforestation and to agriculture and infrastructure. Recent forest policies often have the policy goal of increasing the forest area by planting trees. This target, together with restoring degraded forest ecosystems and shaping more resilient forests as nature-based solutions for climate change adaptation, can be synergic with more ecological connectivity and biodiversity restoration of species and habitats under threats by competing land uses (AT, CZ, DE, ES, IT, NL, PL, SK). Yet, reaching the established targets can be difficult for different reasons.

The agricultural sector is reluctant to increase forest cover on fertile and productive soils (e.g., LT, RO), or to formally change the land use from agriculture to forest in rural remote areas (e.g., IE). This would reduce the economic value of the land while increasing restrictions for management, thus further contributing to the rural area depopulation that rural development and forest policies are trying to mitigate (e.g., IT).

Also, the idea to **expand forest areas may be in conflict with space for new infrastructures** (wind turbines, solar panels) to produce renewable energy (e.g., DE, RO) or, in general, building infrastructure is prioritised vis-à-vis forest or biodiversity conservation based on compensatory payments (e.g., IT).

In other countries, the process of changing the official land use status is quite cumbersome (e.g., LT, RO), which relates to strongly debated changes of the legal definition of what forestlands are (e.g., IT, RO). The mechanisms and funds allocated to compensate farmers to shift from agricultural production to forestry, as well as to restore forest ecosystems and/or convert land to building infrastructure, are insufficient, and their effects not monitored enough (e.g., ES, IT, RO). Recent research shows that it may lead to a low rate of measures acceptance by local actors (Juerges et al. 2021).

4.3 Drivers for implementation capacity of countries/regions

4.3.1 Domestic forest policy developments

In the last decades, **national and regional processes** emerged with the precise purpose of building a shared vision for future forests by engaging concerned forest-related stakeholders and political decision-makers to agree to long-term forest policy goals (e.g., National Forest Programmes in AT, FI, IT, etc). Although many of these policy processes have resulted in approved documents, not all of them have succeeded in reaching a final political consensus, and some are still ongoing (e.g., CZ, DE, FI, ES-CAT, LT, SE, SI, PL). There are indications that these participatory processes on (future) forest-related topics across sectors (like in AT) have created a broader support for forest policy. Yet, in other countries, they have suffered from a lack of political commitment and importance with respect to other sectors, especially considering the forest sector's importance vis a vis the national GDP (e.g., ES-CAT, IT).



In other forest-related negotiation processes, decision-making barriers may arise and latent conflicts become more visible. This has led, in some cases, to some stakeholders stepping out of the process and an increased polarisation of discourse (e.g., FI, IT, PL, SE). In this regard, scholars have analysed the influence of historical path dependencies to explain collaboration constraints in forest-related policymaking processes (Raitio 2012; Pecurul-Botines et al. 2014). In sum, the move towards more participatory ways of designing and implementing forest policy is partially seen as promising but plays out quite differently depending on the context and commitment.

4.3.2 Forest politics, administrative structure and policy fragmentation

The newer EU forest policy developments, public opinion in member states and the overall political priorities at national and regional levels are leading to a redefinition of competences and administrative structures in forest policy. This redefinition is particularly visible for the environment, agriculture/rural development and forest policy domains. **Missing policy coordination** remains crucial for countries (e.g., AT, DE, IT, ES etc) characterised by multiple level and regional governance structures that are not well coordinated. In other countries (e.g., SE and ES-CAT), changes in administrative structures are easing some policy coordination. The experts' interviews highlighted at least three situations that can be described in different countries.

1. There is an ongoing dispute over power and competences at the ministerial level between the fields of agriculture, forestry and rural development, where forestry was traditionally allocated in most countries, and the fields of environmental and biodiversity protection, whose relevance is growing within general public opinion, in some countries (e.g., FI, IT).
2. While the jurisdiction of forests under the Ministry of Environment facilitates a coherent formulation of policies for forestry and nature conservation, in contrast, the coordination of forestry and agricultural interests (e.g., in relation to rural development goals and wood production) is becoming more difficult (e.g., LT, RO).
3. Political decisions leading to a restructuring of administrations and a merging of Forests and Environment directorates under the same Ministry of Agriculture enable more coherence between these two policy domains (e.g., ES, including CAT and AND).

This redefinition of the area of influence can also be observed within the European Commission, where more and more forest-related policy initiatives are related to the environmental competency of the EU, and are consequently led by DG Environment and DG Clima, but also DG Energy etc, shifting political power from DG Agriculture. The increased emphasis on environmental goals at EU level is, on the one hand, an expression of shifting public opinion, but on the other hand, also influencing it through changed narratives and decision-making power at EU and country levels.

Some interviewed experts saw the strategic emphasis of the EUFS as a (partial) mismatch with national forest-related goals or with their implementation approaches (e.g., FI, SE).

Forest policy prioritisation is driven by politics and dominant political choices. The perceived shift towards environmental concerns at the EU level has led to increasing attempts to resist EU decision-making on forests in some countries (e.g., ES-PVQ, FI, PL, SE), emphasising national approaches to policymaking and forest management, and calling for the enactment of subsidiarity principle and preparing for self-sufficiency (e.g., FI, SE, SI). At the other end of the interest scale, environmental NGOs are currently perceived to be using the EU as the main channel for pursuing their interests (e.g., IE, RO, SE). Put against the policy shift at EU level, this can increase polarisation.

The changed geopolitical situation and climate change (mitigation) are used by some countries to advocate for strengthening the domestic supply of raw materials to reduce their external dependency (e.g., AT, CZ, FI, PL, RO, SK). However, the national forest policy of some countries (ES, IE, IT, RO) has already been directly influenced by the EU Forest Strategy. This can be explained in part because of the coincidence of the timing in updating their own forest visions. However, it needs to be seen if gaps between stated goals and implemented actions appear or not.

4.3.3 Highly demanding forest goals and scarcity of public resources

In most analysed countries, the human and financial resources allocated for the effective application of policy goals (e.g., support for forest owners and farmers to prioritise biodiversity conservation instead of business-as-usual practices) are seen as insufficient. In some cases, a **lack of human and economic resources** constrains the ability of public administrations to manage forest goods and services, and to achieve ambitious goals (e.g., ES, IT, RO etc). At the same time, the institutions (public forest administrations, regional administrations) responsible for policy implementation often do not have enough capacity and resources to implement and achieve new and highly demanding policy goals. These are needed to tackle ever-more complex, dramatic and fast-emerging challenges.

Recent research in NL (Probos 2023) showed that planting trees to reach the ambition to realise 37,400 ha of new forests in 2030 is already behind schedule due to uncertainty, lack of financial means and scarcity of available locations. The slow and/or limited action by public forest administrations to provide traditional technical advisory services, planning and regulation while also offering a more socially inclusive and pro-ecological approach to push forward real changes (eg IT, PL), when also combined with limited resources, might be a risk for the future.

The mechanisms and/or funds provided, for example through EU rural development policies to support the voluntary enlargement and maintenance of protected areas (Natura 2000) (IT), or conversion of (abandoned) agricultural land into forest lands (LT), are not considered sufficient or not well designed and applied in practice. For example, excessive regulation and bureaucracy have been observed to lead to opposite results than those intended, such as the destruction of bird nests (LT, RO) (Brukas et al. 2018).

The lack of financial resources to implement more biodiversity-friendly measures systematically contributes to the polarisation of rural residents' and landowners/managers' positions against conservationists and a pro-environmental EU-agenda. It also jeopardises efforts to enhance nature values nationally. Moreover, direct payments to farmers from the EU's Common Agricultural Policy are questioned when their positive impact on the environment cannot be proved through monitoring (e.g., ES-CAT).

4.3.4 Different interpretations of sustainable forestry and closer to nature practices

From the analysis of expert interviews, **two diverging understandings of what sustainable forest management** (SFM) means emerged. It was seen as a:

- (1) goal (maintenance of forest abilities to provide goods and services), or
- (2) mechanism (a set of actions intended at maintaining socio-economic benefits of the forest value chain associated with managing forest and its products).



The first approach wants forest management done in a way that captures its different functions, including wood production and biodiversity protection. The second approach sees sustainable forest management as a guiding instrument for management practices and actions to (sustainably) provide raw material for the timber and energy industry, and cultural, protective and biodiversity services for citizens and communities (e.g., NL, IT). In that sense, SFM was referred to as a mechanism to guarantee that forests secure without risk a large set of goods and services to meet manifold social demands. This positive impact view of SFM is challenged by environmental interest groups.

The idea that active forest management has positive consequences for forests and their capacity to provide a wide range of ecosystem services (provisioning, regulating and cultural) (Bussola et al. 2021) including to support biodiversity and forest resilience, apparently contrasts with the goal that more forests must be strictly protected, without management interventions, to protect biodiversity and mitigate climate change. Both diverging views can also be found in the EU Forest Strategy (Lier et al. 2022).

Some countries are currently revisiting and strengthening conservation concepts such as the protection of old-growth forests, ecological restoration and networks of strictly protected areas (e.g., IE, ES-CAT, NO, RO). For instance, defining and identifying old-growth forests is reported in two countries (e.g., ES-CAT, RO) as a key action that needs to go in hand with financial support, but also without excluding active management.

Forest certification played an important role in pushing towards more pro-ecological and social forest management in the last decades. This entailed the adoption and periodical auditing of standards for sustainable management and use of forests. Given the dualism between the more environmentally oriented and socially negotiated FSC standards, and the more industry related PEFC standards, it is notable that, in some cases, public forestry turns towards the latter in the recent decade (e.g., PL).

4.3.5 Public opinion, crises and the under-considered role of media

Urban and rural visions of forests and nature are different, but rarely discussed. Different visions might relate to different understandings of forests, forest management and its goals. For example, while the fundamental role of forests in terms of environment protection (especially in relation to climate change mitigation and biodiversity safeguarding) is well known, their role in supporting local economies and job opportunities in rural and mountain areas, as well as in maintaining traditional landscapes, is almost neglected by the public (e.g., ES, FI, IT, RO). In most cases, it seems divergent opinions co-exist: while wood production in general is not viewed favourably by public opinion (e.g., ES, IT, LT, NL, PL), the consumption of wood for energy production (e.g., IT, RO, SI,) and the demand for timber as a valuable product for buildings and interior designs remains high or increases (e.g., ES (including CAT, PQV), FI, LT, NL, SI, SK).

A citizen's environmental orientation values are the main predictor for valuing forest functions such as natural hazard protection, climate change mitigation, preservation of plants and animals and beauty, while forests are less valued in their role in supporting local economies through wood production and job opportunities in rural and mountain areas (e.g., in AT, ES-CAT, DE, FI, SE). This is confirmed by previous studies on forest perceptions (Ranacher et al. 2020; Pülzl et al. 2021) and expert interviews.

In some cases, **media** focuses on a few specific forest-related emotional issues, such as illegal logging (RO), or catastrophic events (fires, pests and storms) that have an impact on public opinion (e.g., CZ, DE, ES (including AND, CAT and PQV) IT, PL, SK). Climate change and disturbance events are seen as an opportunity to promote forest management to increase forest resilience (e.g., CZ, ES, PL, SI, SK), but also as an opportunity to move towards natural regeneration and closer-to-nature forestry. Windows of opportunity are open

for policymakers to engage in communication campaigns to contact and engage forest owners in active forest management. However, while limited knowledge exists on the role of media in forming public opinion on forests, there is evidence of their influence (e.g., on the use of woody biomass for energy production in NL). For instance, in Nordic countries (e.g., FI, LT, NO, SE) and RO, media coverage of the conflict between forest management and biodiversity has increased.

In addition to socio-ecological crises, more recent socio-economic, health and energy crises, as well as the persistence of regional and global geo-political instabilities (Russia-Ukraine war, China-USA tensions, migration flows etc), may change future media reporting and public opinion on forests. These crises are likely to influence policy choices around securing energy and primary material sources for the future, and will not necessarily respect the directions agreed so far.

What seems to be important for defining forest policy priorities is how to handle **tensions between emergency-based and long-term visions**. Efforts are now concentrated into urgently reacting to emergency issues, such as the climate and biodiversity crises (e.g., Verkerk et al. 2022; Muys et al. 2022) and their consequences (e.g., bark beetle attacks, mega forest fires, extreme droughts, heavy storms and decline of forest health) (e.g., Patacca et al. 2023; Grünig et al. 2023). More structural changes are missing, as well as investment in improving communication and dialogue between actors across sectors. Moreover, the use of a system thinking approach and adequate use of regional messages regarding actions such as planting trees, defining old-growth forests, and restoration is lacking.

4.3.6 Lack of systematic conflict resolution and shared future forest vision

While at national levels the **increasing polarisation of ideological positions** is hard to solve, at local levels site-specific and fact-based compromises can be found among stakeholders. Past research (e.g., Wallin et al. 2016) has shown that, at national levels, the more conflicts are ideology based, rather than fact-based, the more difficult they are to address. However, while diverse forest management regimes co-exist within countries and regions, mechanisms to establish adequate scales for prioritisation (i.e., landscape level) are widely lacking.

Participatory bottom-up processes at regional levels, which allow explicit exploration of the underlying factors for FES prioritisation and promote learning about FES demand-driven partnerships between forest owners and managers, business, society, policymakers and scientists, are not systematically used (Saarikoski et al. 2013; Tikkanen et al. 2016). These processes have been proven to significantly improve mutual trust, understanding and reduce historical conflicts frequently associated with competing demands for FES in local settings (Winkel et al. 2022). These tools could ease compromising solutions between the stakeholders, building trust, bridging interests, transparently sharing information and engaging professionally qualified facilitators.

Moreover, when it comes to local conflicts, creating responsive and collaborative approaches between different actors is necessary (Mustalahti et al. 2021). A fine example of this is found in Finland where third party facilitators played a key role in mediating the conflict between nature conservation and the forest administration (Akordi 2021).

Finally, **mechanisms to develop shared visions for future forests** and related realistic objectives over time are lacking in most of the countries. The process of urbanisation is seen as an important means in this context (e.g., ES-AND) as citizens are seen as having lost touch with the notion of landscape (including the role of grazing and forest management). Yet, these are seen as critical factors to enable policy integration and societal transitions from a scientific point of view (Aggestam et al. 2023). If these goals are not set, business-as-usual approaches are likely to prevail, which may again lead to more controversies and stronger regulation as policy goals are not met in implementation.



5 Way forward – policy recommendations

This study has revealed once again the striking diversity of socio-economic, environmental and political settings for forests and forestry in Europe. Differences related to ecological site conditions, which determine the type of forest, and basic socioeconomic factors such as ownership, societal demands and needs, and private sector interests in relation to urban or rural forest settings, are determining past and current forest governance and management practices in European countries.

At the same time, this study has also indicated some common issues for forest governance and management across Europe. These relate most notably to a considerable divide of forestry and conservation interests that is found in all studied countries, the increasing impact of climate change and related forest disturbances (with regionally different consequences for forests and forestry), and the embeddedness of European forest governance and markets within larger structures, for example related to (global) energy and resource trade and investment patterns. Other patterns in the findings of this study relate to 'silences' in member states' policies, e.g., missing references to forest-sector specific internal threats to biodiversity (as described by Muys et al. 2022), as well as to the risk (and reality) of conversion of old-growth forests, or missing action and strategies to collect data that is not (yet) part of 'traditional' monitoring and reporting activities and systems.

Given both the diversity of settings and similarity of key challenges, the following policy recommendations differ in nature. Some of them are relevant for the whole of Europe (but would still need to be adapted to regional settings), while others are more important for specific countries or groups of countries. In line with this, we offer the following set of nine recommendations as a toolbox to choose from.

Recommendation 1: Reconsider and agree on shared European key objectives on forests.

Against the background of interconnected ecological crises, socio-economic changes and increasing societal support for resolving environmental concerns, the EU has set up its Green Deal as a comprehensive policy package to enable sustainability transitions for Europe's societies and economies. Connected to the EU Green Deal, recent years have seen a larger number of policy responses to an environmental crisis with specifically climate and biodiversity-related policies that also concern forests. They come with ambitious objectives and envisaged instruments, as summarised in the EU Forest Strategy.

This has intensified the already existing polarisation of conservation and forest use interests at the European policy level. In short, the disagreement comes down to the question: is forestry considered to be "part of the problem" (an activity that is harmful for biodiversity and climate concerns) or "part of the solution" (a major pillar towards a more sustainable bio-based European economy). Arguably, the reality may be situated between those competing world views. Agreeing on a combined vision for forests and forestry that bridges sectoral worldviews and interests, based on a vice versa acknowledgement of legitimate concerns, will be critical to move beyond the ongoing sectoral and policy level related competition in forest policy, which this study observed in several European countries.

The EU Forest Strategy, and further connected EU forest related policies, formulate some key objectives for European forests that may be interpreted as enjoying undisputed European consent. Those encompass, for instance, the termination of any illegal forestry related practices in Europe, and the effective protection of old-growth forests. However, for the latter there are still considerable ongoing discussions regarding the definition of those forests. Further key objectives relate to the principle to manage European forests

sustainably for multiple societal demands, ecologically restore degraded forest landscapes, adapt forests to climate change, advance a European bioeconomy and ensure the availability of wood, involve plural societal groups in the decision-making on public forest lands, and so on. Most of these objectives are spelled out in the EU Forest Strategy and in national policies, albeit to different degrees. However, the ongoing debate about the EU Forest Strategy makes it difficult to assess how far a normative consensus on superordinate forest policy goals in Europe really does exist and is shared by all.

Hence, we recommend that the EU Commission as a whole and the member states revisit these goals and (re-)confirm political consent on their importance in a high-profile policy forum involving multiple stakeholder groups and including scientists. They should subsequently and jointly work on their effective implementation in Europe, ensuring intersectoral collaboration and fair burden sharing, and demonstrating global responsibility.

**Recommendation 2:
Respect the diversity of forestry settings in Europe and strive for
regionally adapted implementation trajectories for European forest policy
goals and EU forest related policies.**

As outlined above, Europe's forests and related environmental, socioeconomic and cultural issues are diverse, resulting in the need to adapt policy regionally solutions to commonly set goals. For instance, large-scale expansion of the forest area through planting trees or natural forest (re/) growth may be highly beneficial in urbanised areas and landscapes characterised by large-scale intense agriculture, such as in the Netherlands, but less so in already densely forested countries such as Finland or Sweden.

The implementation of European policy goals and policies needs to happen in a manner that gives enough space to account for regionally and nationally diverse settings. This calls for the need to transform key European forest policy goals and policies into regionally suitable policy frameworks and policy instruments that also account for specific regional institutional settings and forest policy cultures.

Yet, the call for diversity must not be misused as a strategic argument to not implement commonly agreed objectives and policies that are relevant in all European countries. Rather, diversity calls for a thorough participatory assessment of regional concerns and priorities in the light of shared European policy objectives and embedded in a joint EU policy framework (see recommendation 3).

**Recommendation 3:
Strengthen the social licence for forest policy; involve
a diversity of voices including society at large.**

Changing (and/or more explicit) societal demands towards multiple forest ecosystem services are a frequently reported pattern in European countries. These diverse demands are partially mirrored in sectoral competition, and even polarisation, relating to forests. Societal and economic interests vary from environmental NGOs to industry representatives, different types of forest owners, experts and scientists from different fields and disciplines, and media. They also differ for many interested (lay) citizens and local communities. In many countries, a diversity of views exists on forests and forestry that is also well mirrored in the findings of empirical social research. At the same time, the EU Forest Strategy gives little emphasis to societal participation, while participatory instruments used in the forest sector (e.g., National Forest



Programmes) have, in many cases, facilitated defining a goal framework but often also lost momentum during implementation.

Given the diversity of viewpoints, and the importance of forests for the society at large, we recommend a renewed emphasis on participatory and inclusive forest policymaking at all political levels.

- *At the EU level*, European citizen panels or fora and systematic surveys, as well as online-participation tools, should be used to connect EU forest decision-making more proactively to European societies. These elements are not meant to replace the current policymaking processes characterised by a combination of (indirect and direct) democratic representation, bureaucratic expertise and lobby negotiations, but could complement them and also connect them directly to societal views and demands on forests that are underrepresented by experts or interest groups. This could lead to more democratic legitimacy for EU decision-making.
- *At national or regional levels*, new and open policy dialogues or fora could be established that involve all concerned societal groups and are open for larger societal participation. This could include local forest experts, who are also often neglected in national forest policy processes, or the younger generation who will have to bear the consequences of today's decisions, and are connected to the idea of developing shared visions and main objectives for forests and forestry at these levels. These can then be transformed into policy instruments.
- *At local levels*, participatory forest planning approaches could be used; possibly also using new tools for internet-based participation, as they can be powerful tools to increase transparency and legitimacy of strategic forest management planning, at least in public forests.

A genuine and fair representation of all forest-related interests beyond (but including) experts and interest groups seems to be a critical element for increasing legitimacy and support for European forest policymaking at all political levels, and to make sure that policies do indeed meet regionally diverse socio-economic demands. Moreover, participatory planning, which addresses different ecosystem trade-offs and involves concerned societal groups and scientists systematically in goal formulation, could become important to consider. It would enable the articulation and discussion of trade-offs between different outcomes and values to reach consensus about different forest management options in a specific context beyond ideological discourses.

To be clear, such an ambition arguably has a utopian element and may sound overly optimistic while also downplaying the role of strategic interests and power in participatory settings. Yet, given the polarisation in current forest policymaking in several cases, and the frequent lack of transparency in how agendas are developed in the one or other direction, pursuing such a basically democratic utopian vision seems a project that may indeed “unite in diversity”. To work towards such an arguably ambitious political goal, not only through a Europe-wide stocktaking of existing experiences, including cases where participation has not met related expectations, but also a related learning process from best (and bad) practices, could help to move beyond calls for more participatory decision-making on forests towards it becoming a forest governance reality.

Yet, a call for participation should not be misunderstood – and misused – as an invitation for creating delays to act and engage in a sustainability transition.

Recommendation 4: Invest in knowledge generation and knowledge communication.

The demand for scientific, but also practical-experiential, knowledge, generated and communicated in a timely way, increases with ongoing environmental change and the increasing broader set of policy objectives set for forests at EU and country levels. However, there is also a need to:

- a) improve the evidence base for forest policy decision-making, inter alia through research that responds directly to critical knowledge demands in the policy system, and
- b) advance means of knowledge communication and knowledge co-creation between science, forestry practice and society.

For all, new formats are needed that i) bridge the sectoral and knowledge siloes that are also visible in the research communities to elicit the best available knowledge, and ii) enable forest owners and managers and multiple societal groups with an interest in forestry matters to take informed decisions or contribute to forest policymaking on the basis of best available knowledge.

One specific emphasis may be put on the broader set of informational policy instruments, and especially advisory services for private forest owners that own most of the EU forests. Here, it is important that advisory services enable private forest owners to take their own informed decisions based on information that encompasses all forest policy objectives, and do not *a priori* prioritise wood production and “wood mobilisation” in their activities. For this, sufficient resources should be made available for interactive individualised advice and not restoring to “cost-efficient” one-way transmission of information, e.g., with the help of digital tools.

Going beyond forest owners, in some countries larger educational investments (e.g., reintroduction of ecology courses at schools) are also needed to significantly increase the knowledge of non-experts about the relevance and dynamics of forest and nature.

Recommendation 5: Connect policy objectives to economic incentives.

Forests in Europe are mostly privately owned and, in many cases, public forestry is organised by means of (publicly owned) forest companies that usually have to align financial and non-financial objectives in forestry, with the by far highest share of income generated from wood production. The economics of forest management are hence essential if the broader objectives of the EU forest strategy are to be implemented.

There is, in short, a clear need to align policy objectives and (public) funding streams in forestry. Our study has shown diverging trends across EU countries. For instance, in Germany and Austria, new public subsidy schemes have been established to support the ecological restoration of forests (in many cases to replace spruce plantations) impacted by climate change and which are connected to (some) ecological objectives, while for example in Sweden, public investment in nature conservation measures has recently declined. Ensuring consistency of policy ambitions and financial support schemes – and possibly working towards transforming (parts of) the CAP into a more visionary European (forest) landscape PES system – seems imperative if both the biodiversity and the bioeconomy vision connected to forests under the Green Deal should be implemented in European forestry. The acceptance and coherence of an EU-wide policy on



forests is pending on financial means to support the implementation of such a policy. The increasing impacts of climate change related disturbances may create the legitimacy for such a (public) investment (see Winkel et al, 2022).

Embedding the economic aspects of forests into forest related policy decision-making does, finally, also include the need to be mindful of the larger, economy-related implications of forest policy decisions, not only for forest-based industry but also for forest related consumption and production in a broader perspective. The latter involves aspects of global trade and related leakage effects. In other words, balancing European and global forest goals will inevitably involve an assessment and understanding of the larger forest related macro-economics – not as the sole driving aspect for forest policy, but as an important factor to be considered in forest policymaking.

**Recommendation 6:
Tackle climate change and use it as a leverage point for
a renewed societal deal on forests.**

Climate change is increasingly turning into a challenging reality for forest management in Europe. With the current trends continuing, even more intense impacts can be expected in the years to come, shattering established views on forests, forest management and biodiversity conservation. Moreover, large scale disturbances linked to climate change have already promoted forest policy issues to topics for high politics (for example, mega fires, or large scale forest diebacks), putting forest issues on the public and political agenda, and requiring political responses. Policy responses have partially followed the established “response patterns” in the forest policy subsystem (e.g., close to nature forestry versus intensified forestry with shortened rotation periods) but have also opened up new spaces for consensus (e.g., the necessity to diversify forests to increase resilience).

We suggest considering using the pressure resulting from climate change and disturbances proactively as an opportunity to invest in forest adaptation, striving for synergies between main policy objectives such as biodiversity, climate change mitigation and bioeconomy advancements. Ecologically oriented forest restoration, close to nature forestry approaches (but with consideration of an overall changing nature), and policies that support forest owners and managers to advance adaptation through increasing diversity and resilience, possibly connected to new policies such as carbon farming, will provide new leverage points for a renewed and positive political focus on forests as green infrastructure to contribute to climate change adaptation and mitigation.

**Recommendation 7:
Improve information on policy impacts and adapt policies accordingly.**

A frequent pattern identified across countries in this study is the lack of reliable information on larger and more complex forest policy effects and impacts. Except for selected financial policies, there is a lack of systematic evaluation to assess how current (EU and national) forest related policy instruments are effective on the ground, and who is benefiting from their impact (or non-impact).

Independent and evidence-based policy evaluation studies would be an essential basis for ensuring that current and future policy instruments are efficient and effective. Those studies could combine an analysis of policy implementation processes with forest related information, based on new monitoring means

and including data from national forest inventories. Arguably, the latter would need to be adapted in case they cannot provide policy relevant information, e.g., relating to biodiversity or recreational use of forests. Finally, information resulting from these studies needs to be included in revisiting policies and policy instruments, creating an adaptive cycle for policy revisions based on information about policy effectiveness.

**Recommendation 8:
Establish a cross-country dialogue on forest governance.**

European countries have different political cultures that are also visible in forest governance. For instance, for some Central, Eastern and Southern European countries, a strong hierarchical forest policy was reported that may impede flexibility and innovation, particularly for private forest owners to develop solutions for forest related challenges. In contrast, insufficient environmental standards in some Nordic countries (e.g., regarding limits on intense soil treatments or large-scale clearcutting) may limit the potential for integrating biodiversity aspects beyond protected areas. Furthermore, there are multiple experiences with policy instruments ranging from regulation to financial incentives and information provision, and with different policymaking and implementation cultures involving various forms of participatory approaches.

We recommend seeing this diversity of political cultures and experiences with different policy instruments as a huge potential for forest policymakers to connect and learn from each other. Hence, we recommend establishing a systematic cross-country dialogue among European states and involving the European Commission to exchange experiences, best practice and failures, to enable and encourage learning across country borders either using established platforms or creating new ones.

**Recommendation 9:
Increase transparency of forest policymaking at all levels.**

A final recommendation of this study is to continue working towards transparency of forest policymaking at all political levels. In the context of this study, we received critical feedback from national forest policy experts regarding the EU Forest Strategy process, which was described as lacking in transparency and accessibility for them, despite an extensive public consultation process. In contrast, in some European countries, environmental or citizen groups consider national forest policymaking difficult to access, which in turn leaves them reaching out to the EU level to advance their concerns. Arguably, the perception of transparency may also be connected to the (dis)agreements policy actors have with the content of a policy, which is then related to their own perceived impact.

While assessing transparency in forest policymaking was not an explicit objective of this study, we recommend putting additional emphasis on this principle in forest policymaking and implementation. Effective information of the wider society and diverse groups will require engagement with new and traditional media as well as science communication. Access to information is an important step to enable society to understand the contributions of public and private forest sector actors to sustainability, and to hold them accountable to the commitments made in policy and practice.



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