4 The keys to the EU's climate neutrality goal

Forest carbon and LULUCF

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The European Green Deal and land-based net carbon absorption

The overall aim of the European Green Deal (EGD) is to reach so-called climate neutrality by 2050, i.e., the remaining balance of greenhouse gas emissions (GHGs) shall be offset by an equal amount of negative GHG emissions (sinks) to arrive at net-zero emissions by the target year 2050. The intermediate goal of reducing net GHG emissions has been set to be at least 55% by 2030 compared to 1990 levels. For the first time, the EU plans to systematically use GHG sinks as part of its overall strategy to reach net-zero climate emission goals. While the European Commission also foresees the use of new technological solutions such as carbon dioxide removal, land-based carbon sinks are proven at scale and will have to shoulder the major sink function for carbon neutrality (European Commission, 2020b, p. 7). Within land-based carbon sinks, forests are the single largest contributor. In this chapter, we focus on the proposed EU-internal land-based strategies and especially on forest-related strategies in the pursuit of enhancing carbon sinks within the EU as proposed by the European Commission. We outline the European Commission's specific position in detail as proposed in the EGD of 2019. We argue that Commission proposals are of a high political relevance to understand how the objectives of the EGD can be achieved. Focusing on the European Commission as the key actor, we are *not* discussing the long-standing conflict and diverging positions among EU institutions, member states, and non-governmental organisations (NGOs) regarding carbon sinks to fulfil the EU's mitigation goals (e.g., Savaresi et al., 2020; Sotirov et al., 2021; see also Gheuens in this volume). Instead, this chapter focuses on key initiatives of the European Commission in the pursuit of forest-related carbon sinks to accomplish the 2030 GHG goals and the 2050 goal of net-zero GHG emissions during the Presidency of Ursula von der Leyen. While these proposals may differ from the final negotiated outcomes, the principal directions they are taking are likely to remain in place for the time being and will help guide our readers. To analyse how the European Commission proposes to induce change regarding carbon sinks, we employ the analytical framework of this edited volume, focusing on the logic of consequences and the logic of appropriateness (see Dyrhauge and Kurze's introduction to this volume). Accordingly, we interpret which aspects of land-based policies proposed by the Commission better reflect each of these logics and the mechanisms at work

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(or, potentially, neither). Thus, we contribute to the research question of how the single most important key actor (i.e., the European Commission) pursues the objective of the EGD.

In the following section, we review the EGD as relevant to land-based sinks and the overall EU goal to become climate neutral by 2050. The section thereafter outlines the analytical framework and how we will apply it in the domain of land-based carbon sinks. The two subsequent sections provide a review of the key Commission proposals, respectively, the EU Forest Strategy for 2030 and the Land Use, Land Use Change and Forestry (LULUCF) Regulation. Finally, we outline policy recommendations on how land-based carbon sinks could effectively contribute to meeting the EU's goal of becoming climate neutral.

The European Green Deal and forest carbon sinks

Without any ambiguity, the Commission declared in 2020 that "[t]he President of the Commission has made the EGD the top political priority. … A balanced, realistic, and prudent pathway to climate neutrality by 2050 requires an emissions reduction target of 55% by 2030" (European Commission, 2020d, pp. 1–2). This communication was backed by the EU Climate Law passed in July 2021 (European Commission, 2020b, Article 2). In the European Commission's envisioned trajectory, Europe's GDP is allowed to more than double between 1990 and 2050; greenhouse gas emissions have to be reduced by 90% by 2050 compared to 1990 levels, and remaining emissions are to be offset by yearly net carbon sink enhancement by 2050 (Figure 4.1). Compared to current levels, land use and forests are expected to make increasing contributions from 2030 onwards, given enhanced policies (see Sections 4 and 5 below for details).

Since building up net negative emissions is a long-term policy challenge (Sprinz, 2009a, 2009b), prudent planning is required now to deliver sink capacity in the future. Until recently, the EU largely eschewed permitting forest carbon, the major net sink component of LULUCF in the EU (see Figure 4.2), to make a contribution to its own climate strategy, despite allowing it within the international architecture of the United Nations Framework on Climate Change (UNFCCC) Kyoto Protocol (European Commission, 2008). In particular, the EU was hesitant in the global context about a lack of ambition, the additionality of policies, a lack of monitoring, reporting, and verification, as well as liability for permanence (European Commission, 2008, p. 12).

Forests serve as the major land-based carbon sink over time, yet the net absorption of carbon fluctuates, as Figure 4.2 demonstrates. Against this background, the 2050 climate goal of net-zero GHG emissions (or climate neutrality) requires substantial intra-EU policy change: The 2050 long-term climate neutrality goal requires the inclusion of LULUCF by design. While relatively small at present in comparison to GHG emissions, LULUCF will be a crucial policy lever in the run-up to 2050 as well as throughout the second half of the 21st century when remaining yearly emissions have to be offset by yearly carbon sinks. The European Commission now acknowledges that:

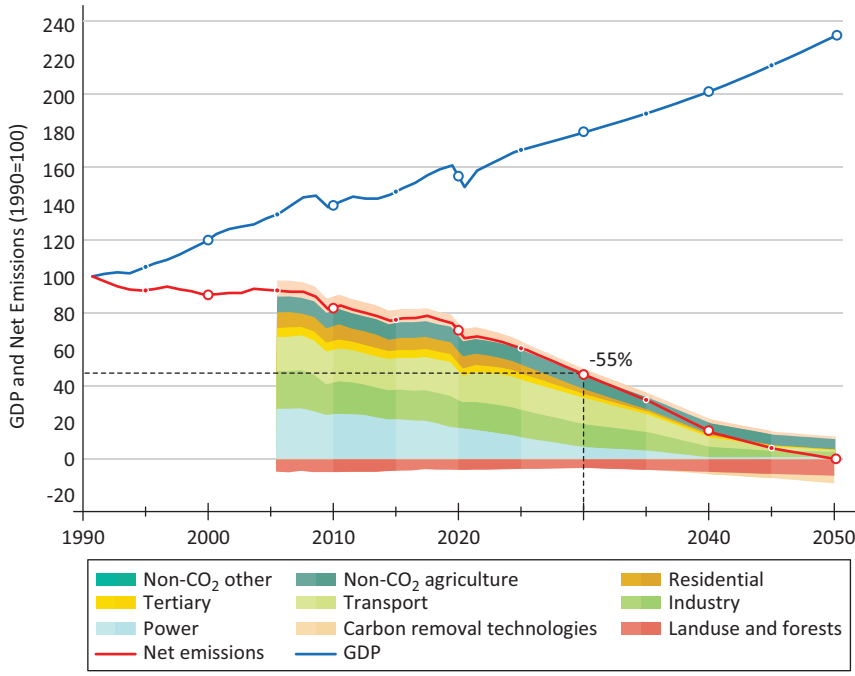

Figure 4.1 The EU's proposed route to net-zero GHG emissions Source: European Commission (2020d, 7). Produced by DG CLIMA, used according to the EUR-Lex copyright notice.

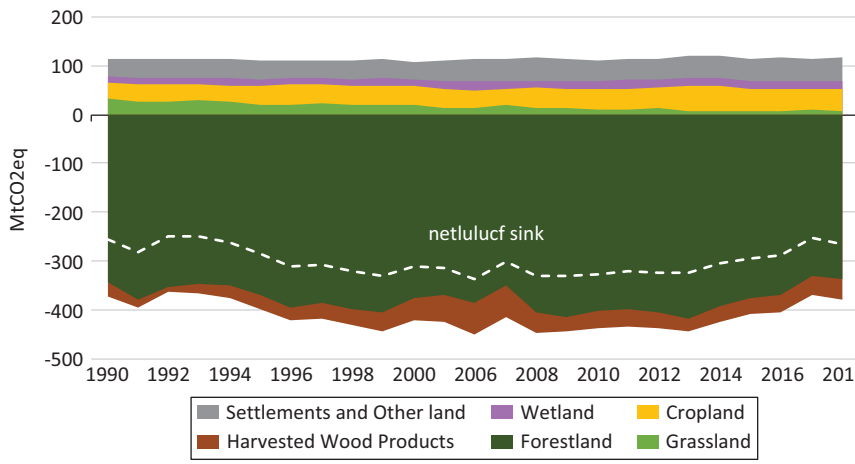

Figure 4.2 LULUCF emissions in the EU (1990–2018) Source: European Commission (2020a, p. 93). Produced by DG CLIMA, used according to the EUR-Lex copyright notice.

> the EU land use sector is of particular importance, given that it presently provides for the largest source of net removals of CO_2 from the atmosphere that humans can impact. Restoring and growing our land carbon sink – the ability to absorb CO_2 by our natural environment such as trees – is crucial to our climate goals. … We need a growing sink in order for the EU to achieve climate neutrality by 2050. Reversing the current trend requires significant short-term action due to long lead times, especially in forestry. This includes improved and enforced forest protection and more sustainable forest management as well as sustainable re- and afforestation and improved soil management including through the restoration of wetlands, peatlands and degraded land in line with the Biodiversity Strategy and contributing to its aims
>
> (European Commission, 2020d, pp. 7–8 & 11–12).

Put differently, in the absence of technological breakthroughs, without a solid LULUCF-based build-up of net negative emissions, especially forest carbon, the prudence of the EU 2050 climate goals may be questioned, the internal and external credibility of the EU could evaporate, and the mandate of the EU for climate policy as a union-wide policy could be in jeopardy when member state citizens respond to potential failure. Conversely, LULUCF is a policy *option* for the EU to demonstrate the feasibility of internal, long-term policies, the build-up of political constituents, and an increasing role for EU institutions vis-a-vis its member states. Thus, the European Commission opted for the full integration of LULUCF into economy-wide GHG reduction targets and accounting (European Commission, 2020c).

Despite the crucial role attached to the land-based sector in the European Green Deal, comparatively little specificity was added beyond aiming for a land carbon sink of –310 mt CO_2eq/year by 2030, since only policy intentions were aired, supported by modelling, and a perspective that the combined agriculture, forestry, and land use sector could become the first net carbon-neutral sector (European Commission, 2020a, p. 61; 2020d, p. 17; 2021b, p. 10).

While current net emissions of the LULUCF sector average about –300 mt CO_2 equivalent, their envisioned role by 2050 aims at about –500 mt CO_2 eq/year (European Commission, 2020a, p. 97). With a view of the long-term role that LULUCF plays in offsetting remaining high abatement cost emissions by 2050, the EU Commission acknowledges: "The long-term transition needs to be planned urgently and implementation started with a sense of urgency" (European Commission, 2020a, p. 149).

Subsequent efforts of the European Commission under the "Fit for 55" policy package specified how the 2030 goal of reducing GHG emissions by 55% compared to 1990 levels can be reached. In particular, the EGD was put into the context of the recovery plans from the COVID-19 pandemic and the social cushioning of the transformation. A range of adjustments of pricing and regulatory instruments were employed, and the introduction of new pricing mechanisms such as a new carbon border adjustment mechanism were considered (European Commission, 2021b). All these regulatory interconnections add to the complexity of the undertaking of

a climate-related transition. Most important in the context of enhancing the carbon net sink are the forest-related changes to regulations on LULUCF and, more generally, forests to which we turn in the subsequent sections following an overview of our theoretical focus in the next section.

Analytical framework

The common analytical framework builds on the logic of consequences and the logic of appropriateness (March & Olsen, 1998) as guiding ideal-types to investigate how the EU may induce change in view of achieving the objectives of the EGD at home and abroad (see Dyrhauge and Kurze's introduction to this volume). Here, we briefly point out how we apply the analytical framework to our particular research question regarding the European Commission and its proposals in the domain of forest-related land-based carbon sinks. More precisely, we focus on the governance mechanisms and respective policy instruments and actions proposed by the European Commission. To identify the preferred policies and hence the underlying logics of action in the Commission's approach, we conduct a document analysis (i.e., proposals by the Commission as outlined in the following two sections) and draw on background expert interviews.

In line with the logic of consequences, the European Commission is assumed to espouse clear targets pointing in particular to the costs of not taking action on climate change. More importantly, the prime *governance mechanism* suitable to change the behaviour of rational actors (i.e., utility maximisers) is to manipulate their utility calculations. Hence, following an instrumental rationality, the European Commission is expected to create positive and negative incentives (Börzel & Risse, 2012, pp. 6–7; see also Dyrhauge and Kurze's introduction to this volume). Accordingly, we consider the following policy instruments as reflecting the logic of consequences in the field of land-based carbon sinks: subsidies, tax breaks, support, and payment schemes, as well as clear sanctions in case of breaking sector-specific goals, e.g., a penalty for violating a country's contribution to enhancing forest sinks, as, e.g., legislated for sectors outside the EU Emissions Trading System (e.g., Agora Verkehrwende – Agora Energiewende, 2018).

By contrast, following the logic of appropriateness, the European Commission would rather appeal to the normative obligation of the EU and its member states to reach climate neutrality regardless of pecuniary costs and benefits. In other words, protecting the climate is the right thing to do, especially considering the EU's aspired climate leadership role in implementing the Paris Agreement (Kurze, 2020). To change norms and the beliefs of policy recipients, the European Commission will most likely rely on so-called soft governance mechanisms, namely persuasion and socialisation (Börzel & Risse, 2012, pp. 7–8; see also Dyrhauge and Kurze's introduction to this volume). Translated to the level of policy instruments and concrete action, which we investigate empirically in the domain of forest carbon sinks, the European Commission is assumed to pursue, for instance, policy dialogues, stakeholder consultations, and educational programmes.

Clearly, both logics of action are likely to play a role in the European Commission proposals in the domain of forest-based carbon sinks. However, as pointed out by March and Olsen (1998, p. 949), we seek to identify if one of the logics is more strongly observable in the actual behaviour of actors, in our case the European Commission. In the following section, we review proposed changes to the EU Forest Strategy and the EU LULUCF regulation on land-based carbon sinks, outline the policy instruments, how they are linked to the governance mechanisms, and reveal the underlying logic of action.

The 2021 EU Forest Strategy

In 2021, the Commission released its EU Forest Strategy for 2030 which has a strong emphasis on "the quantity and the quality of EU forests and strengthening their protection, restoration and resilience" (European Commission, 2021a). This new strategy replaces the EU Forest Strategy from 2013 (European Commission, 2013). It acknowledges the vital and multifunctional role of EU forests and forest-related sectors in tackling climate change and biodiversity loss.

Achieving the 2030 climate target and the climate neutrality goal requires substantial effort to monitor the EU's emission reductions as well as to effectively enhance removal by natural sinks. Forests as a natural resource[1] capture and store large quantities of carbon; they will, therefore, play a key role in reaching the ambitious net removal target for the Union of –310 million tonnes of carbon dioxide-equivalents p.a. by 2030 as set out in the 2021 proposal for a revised Regulation on LULUCF (European Commission, 2021a) (see below for details).

Specifically, the EU Forest Strategy for 2030 outlines three main objectives with regards to forests, namely to

- protect and restore EU forests,
- ensure sustainable forest management (SFM), and
- ensure a better understanding of forest ecosystems that includes effective monitoring and planning on EU forests (European Commission, 2021a, p. 3).

For each objective, a set of actions is identified. Some of these actions are clearly quantified, e.g., planting 3 billion additional trees by 2030; others remain general and are not easy to implement effectively, e.g., to encourage the bioeconomy sector so as to embrace sustainable principles (European Commission, 2021d). The EU's pledge to plant 3 billion additional trees will require tremendous knowledge about which tree species are appropriate and to ensure a natural cycle of forest growth and adaptation (Rogal, 2021). It will also take strong commitments by the EU member states to implement this tangible target. If this specific action is implemented fully, it will positively contribute to achieve climate neutrality by 2050 – but less to the EU's intermediate climate pledges for 2030 – since trees need several decades to grow and adapt to the local conditions, depending on the species, density, and other endogenous factors (Magalhães et al., 2021). Although the 2021 EU Forest Strategy does propose payment schemes for forest owners and managers for the

provision of ecosystem services – thus creating incentives in line with the logic of consequences – overall the Commission's approach relies primarily on the logic of appropriateness (see Table 4.1 for details).

In the same vein, forest management practices in the EU member states and regions are diverse and crucial to maintain biodiversity and address climate change in forests. Although the EU's Forest Strategy for 2030 outlines activities (e.g., promoting the uptake of sustainably harvested wood in the construction sector) to ensure sustainable forest management, best practices and show cases have been hampered by lack of knowledge and communication. Therefore, the EU's sustainable forest management framework – under the EU's Forest Strategy for 2030 – outlines "a more detailed screening tool for ecosystem health, climate & biodiversity" (European Commission, 2021a, p. 13), aiming to enhance the understanding of forest management approaches and their impact. It includes additional indicators and determines concrete thresholds or ranges such as respecting the subsidiary principle, initiation on a voluntary basis, and the acknowledgement of regional varieties of forests. The EU's policy instruments are based on the logic of consequences when it comes to specific measures and indicators (e.g., the increased supply of long-lived wood products or incentives for member states to change their regulations on long-lived wood products and to provide an innovation fund in the construction sector), aiming at enhancing forest ecosystem management. This framework, if adopted by the EU member states and the forest stakeholders, will substantially improve the knowledge, the management, and the monitoring of EU forests. This means that the Commission's role to explain and assess these rules, as well as to create "an inclusive space for all forests stakeholders to discuss" (European Commission, 2021d, p. 3) is central, yet also remains unspecific. Here, the logic of appropriateness is more apparent since the EU clearly emphasises the crucial role of dialogue (as a *policy instrument*) across forest stakeholders and preserving the diversified and rich know-how of forest best practices across member states. Similarly, the European Commission's target to increase the skill set of forest stakeholders and to promote forestry training can also be considered through the logic of appropriateness. To summarise, the European Commission relies on the Forest Strategy for 2030 mainly on persuasion and socialisation as policy mechanisms to induce change in view of the overall goals of the European Green Deal.

Thus, seen through the conceptual lenses of the logic of consequences and the logic of appropriateness, the revised forest strategy of the EU is inspired by the need for forest carbon to contribute to the net sinks to be built up by 2050 and beyond, yet the more immediate policy levers appear to be disproportionately inspired by the logic of appropriateness (see Table 4.1). Given that land-based policies take a long lead time to generate effects, and given the EU's goal to become climate neutral by 2050, the logic of consequences appears to be written in small letters while the logic of appropriateness is written in capital letters in the context of forest strategy. Perhaps this should not be surprising since the EU lacks authority in directing the forest policies of member states (Pirlot et al., 2018). If agriculture offers any guidance, substantial amounts of financial incentives and political efforts have to

Table 4.1 EU Forest Strategy objectives and logic of action

Objectives	*Actions/measures outlined in the EU Forest Strategy*	*Logic of the Commission's actions*
Protect and restore EU forests	• **protecting remaining EU primary and old-growth forests (LoA)** • establishing legally binding nature restoration targets for forests such as restoration measures to enhance biodiversity for forest ecosystems* (LoC) • planting 3 billion additional trees by 2030 across the EU; creating payment schemes for forest owners and managers for the provision of ecosystem services (LoC)	• LoA**:** The Commission relies on voluntary cooperation with member states and stakeholders to agree on a common definition for primary and old-growth forests and on a common understanding of sustainable forest management • LoC: The Commission sets out (binding) quantitative targets and creates positive incentives.
Ensure sustainable forest management (SFM)	• **encourage the bioeconomy sector to embrace sustainable principles (LoA)** • promoting the uptake of sustainably harvested wood in the construction sector (both logics)	• LoA: The Commission promotes dialogue and programmes on the sustainable production of non-wood forest products (regional, national, subnational); an increased skill set for enhanced sustainable forest management practices and educational programmes for the public on forest biodiversity • LoC**:** The Commission sets out tangible pledges to increase the supply of long-lived wood products, sets incentives for member states to change regulations on long-lived wood products and to provide an innovation fund in the construction sector.
Ensure a better understanding of forest ecosystems that includes effective monitoring and planning on EU forests.	• improving the monitoring of the state of EU forests including improved remote sensing (both logics) • **ensuring member states develop Strategic Plans for their forests (LoA)**	• LoA**:** The Commission highlights the crucial role of dialogue across forest stakeholders and to preserve the diversified and rich know-how of forest best practices across member states.

(*Continued*)

Table 4.1 Continued

Objectives	*Actions/measures outlined in the EU Forest Strategy*	*Logic of the Commission's actions*
	• **encourage citizen involvement through Map-My-Tree, to keep track of the 3 billion trees roadmap (LoA)** • **creating an inclusive space for all stakeholders to interact (LoA)**	• LoC: The Commission proposes change in the realm of monitoring and reporting, the need to establish an "integrated forest monitoring framework" for the EU at large; the need to create new parameters and indicators and consider digitally innovative tools (Copernicus programmes, Galileo).

Source: Elaborated by the authors based on the analytical framework and European Commission (2021d)
* Detailed indicators are available in the Annex VI – Annexes to the proposal for a Regulation on nature restoration, European Commission, 2022: https://environment.ec.europa.eu/publications/nature-restoration-law_en
Note: **LoA, logic of appropriateness**; LoC, logic of consequences; both, both logics.

be undertaken to make the forestry sector fit for climate neutrality by 2050. EU policies appear, at the time of writing, too timid to deliver scalable forest carbon sinks, and substantial financial incentives or penalties will be needed to deliver the forestry component of long-lasting climate neutrality.

LULUCF Regulation (2018 and Revisions)

EU LULUCF Regulation 2018 and forest carbon

The EU Regulation for the Land Use, Land Use Change and Forestry (LULUCF) sector adopted in 2018 (European Commission, 2018) covers CO_2 emissions and removal and greenhouse gas emissions of CH_4 and N_2O resulting from the management of land, forests, and biomass during the period 2021–2030 (European Commission, 2021c). The 2018 LULUCF Regulation aims at a "no debit" target in LULUCF emissions, i.e., emissions from land use must be entirely compensated by equivalent removals of CO_2 from land use in each member state (which also includes managed cropland, grasslands, and wetlands besides forests) for the period 2020–2030. This regulation was designed to complement the EU Emissions Trading System (ETS) and the EU Effort Sharing Regulation Directives (ESR) – both of which excluded the LULUCF sector. In combination, all three regulations together were charged to reduce EU emissions from 1990–2030 by 40% as envisioned a decade before the proposal for the more recent EGD.

EU LULUCF Revision (2021) and forest carbon

The proposal to amend the LULUCF Regulation released on 14 July 2021 is a cornerstone to ensure achieving the EU's 2030 and 2050 GHG emissions targets. In this proposal (European Commission, 2021c), the Commission has adopted a comprehensive approach describing the substantial changes in the system and the functioning of the regulation starting in 2026 (Schlacke et al., 2022). While some scholars suggest that "the rules do not set incentives for long-term planning of mitigation measures" (Böttcher et al., 2019, p. 6) and "[f]or achieving a higher ambition level in the LULUCF sector that is becoming relevant after 2030[,] the accounting rules need to be accompanied with an overall mitigation target as described in the EU long-term strategy that reflects the sector's expected role" (Böttcher et al., p. 31). Others maintain that the revision of the 2018 LULUCF Regulation represents "work in progress, a dynamic legislative instrument with commitments that are to be tightened sooner rather than later" (Leijten, 2019, 6).

In the 2021 LULUCF proposal (European Commission, 2021c), the Commission suggests strengthening the contribution from the LULUCF sector in line with the revised 2030 climate goals to be set at –310m t CO_2 equivalents. This reinforces the obligation for member states to submit integrated mitigation plans for the land sector and enhances monitoring requirements by way of digital technologies. This reflects policy instruments typically associated with the logic of consequence as member states will have to calculate their total emissions and removals and have to ensure compliance with the rules (European Commission, 2021c, Articles 4.1 and 4.2). The proposal also sets the EU target of climate neutrality for 2035 in the land sector and commits the Commission to make proposals for national contributions to the 2035 target by 2025 (European Commission, 2021c, p. 3) and, more generally, outlines a set of comprehensive goals aligned with the EGD objectives with respect to different policy areas (i.e., climate, biodiversity, renewable energy) and other sectors (e.g., the non-CO_2 agricultural sector).

The revised LULUCF Regulation as a part of the "Fit for 55" package is connected to all ecosystems and economic activities that rely on land and the services it provides (European Commission, 2021c, p. 9). Therefore, it presents synergies and conflicts with other EU land-related policies, i.e., the Common Agricultural Policy (CAP), environmental policies, energy policy, and the Renewable Energy Directive (RED) (Savaresi & Perugini, 2021). The use of forest biomass is an important source of renewable energy in the EU (European Commission, 2021f). Compared to the previous 2018 LULUCF Regulation, minor, non-substantive changes in the LULUCF regulatory framework for the first compliance period 2021–2025 are proposed, yet significant changes are suggested for the second compliance period in 2026–2030 (European Commission, 2021c). The most substantial changes in the Commission's proposed amendments concern forests. The envisioned increase in pan-EU LULUCF removals from –300 to –310 million tonnes

CO_2 (i.e., enhancement of carbon sinks) by 2030 is a minor component of the "Fit for 55" package and does not provide guidance until 2050. Long-term guidance is needed for land-based policies due to policy inertia. The EU will have to play a persuasive and discursive role (Torney et al., 2018) to facilitate the adoption of these changes and thereby the 'green transformation'.

Potentially transformative change through the recognition of "new categories of carbon storage products (including harvested wood products)" (European Commission, 2021c, Art. 9) is proposed. New provisions will ensure additionality and permanence of land-based carbon removal and will require enhanced monitoring of land, thereby helping to protect and enhance the resilience of nature-based carbon removal throughout the European Union. This change can be understood best through the logic of appropriateness: Carbon storage products as well as the related improvement in the accounting, certification, and reporting system reflect adaptation to the increased overall target in the "Fit for 55" package; however, there are no penalties included for non-compliance so far.

Another major change related to the flexibility mechanism (European Commission, 2021c, Art. 13) aims at restructuring member states' compensation for emissions. Member states will have to adopt the EU's new rules to calculate and compensate their removals in line with Forest Reference Levels (FRLs) with an ultimate objective to simplify the accounting rules often judged too complex to implement (European Commission, 2018). Member states will also have to provide evidence for their compensation of emissions that have exceeded removals and thereby of any unexpected decrease in net removals to the European Commission. Overall, this aspect is best understood by the logic of consequences due to the balancing requirement for GHG accounting.

The Commission's proposal to amend the 2018 LULUCF Regulation allows forest carbon to emerge as a key lever across various policies and strategies to achieve the EU's climate targets. Despite the proposed revisions, some key elements still need to be addressed. The use of forest biomass as a source of renewable energy should be revised in both the EU LULUCF and the Renewable Energy Directives (European Commission, 2021e). More rigorous sustainability criteria to evaluate consistently the use of woody biomass in the EU may help address these concerns and ensure transparency (Savaresi & Perugini, 2021). The revised target of a net reduction of 55% by 2030 has led to the LULUCF ambition to increase from –300 to –310 m t CO_2 equivalents, which is insufficient to achieve the 2050 climate neutrality goal. In addition, the EU should clearly specify how it scales up LULUCF to be a carbon sink from –310 mt CO_2 eq per year to –500 mt CO_2 eq per year by 2050.

In sum, LULUCF provides challenges. The ambitions for these land-based emissions are mostly modest. Up to 2030, they contribute little to emissions reductions and are mostly in line with the avoidance of emissions increases. Governance mechanisms and instruments associated with the logic of consequences are potentially relevant in the LULUCF Regulation, as exemplified by the Commission's insistence on monitoring and the quest for transparency. Yet, powerful sticks and carrots are missing in the Commission's proposal so far. By contrast, the logic of

appropriateness builds on norms-guided behaviour. Given that land-based emissions and/or enhancement of sinks ought to make a sizeable contribution to a 55% reduction of 1990 GHG emissions, one may be struck that the "logic of inappropriateness" (i.e., it is appropriate to be unambitious) may be at work – especially with a view towards the climate neutrality goal of 2050.

Conclusion and policy recommendations

In this chapter, we have focused on the European Commission's proposals on the forest land-based carbon sinks to analyse how the European Commission aims to induce increased carbon sinks within the EGD framework. We have applied the analytical framework of this edited volume, focusing on the logic of consequences and the logic of appropriateness (see Dyrhauge and Kurze's introduction to this volume) and related policy instruments and actions. Our findings show that while both logics of action play a role in the European Commission's proposals, the logic of appropriateness dominates the logic of consequences. Overall, we see the logic of appropriateness at work which is – perhaps – a reflection of the modest financial resources available to the EU and the lack of clear European-level authority on land-based sinks, especially forests. In the end, the net-zero goal of 2050 will hinge on the success to create carbon sinks on a yearly basis – which may necessitate powerful incentives, long lead times, and higher political priority by the European Commission as well as its member states.

We also offer a few concluding remarks on land-based policies to increase forest carbon sinks as part of the European Green Deal. Firstly, the EGD with its 2050 goal of reaching climate neutrality on a continental scale clearly does not lack ambition. The 2030 policy proposals for the land-based sectors with respect to LULUCF and forest (carbon) are not ambitious. In order to meet the 2050 carbon neutrality goal, the LULUCF carbon sinks need substantially higher priority and may need to be supported by other policy measures such as carbon capture and storage (CCS). To enhance the current net sink of LULUCF from currently ca. –300 mt CO_2 eq/year to –500 mt CO_2 eq/year constitutes a 2/3 increase and will necessitate decades of lead time. Forest carbon provides the major carbon sink within LULUCF, thereby highlighting the strategic importance of a hitherto largely neglected aspect of EU climate policy. Given the limited time horizon for the revision of the Forest Strategy for 2030 and the LULUCF Regulation, it appears doubtful based on the analysis of the Commission proposals that the EU has a clear and timely strategy to create sinks in order to fulfil the climate neutrality goal it set itself.

Secondly, rather than creating a strong incentive mechanism to reduce emissions and create sinks – such as a remuneration system of guaranteed minimum prices per tonne of carbon permanently sequestered – the EU has opted for a larger set of complex policies in conjunction with the European Green Deal. The limited financial clout of the EU, amounting to about a percentage point of GDP across the member states, is in stark contrast with the multiple double digits of GDP the member states routinely control. The basic challenge of such policy complexity is

consistency and positive interaction among the various levers (e.g., the LULUCF Regulation and the revised Forest Strategy) – as well as the ability to politically steer such complexity. If the EU does not upgrade its sink policies, yet the member states wish to fulfil their net-zero GHG emission goals for domestic political reasons, the EU will have to "muddle through" and might lose substantial legitimacy on one of this century's major challenges.

Thirdly, the member states are in the lead on forests. As the EU does not have much of a mandate on forests and is, hitherto, unable to use incentive-based mechanisms to let the logic of consequences flourish, it has resorted disproportionally to the logic of appropriateness to design its land-based forest-related sink policies. It is doubtful that continent-wide sink enhancement can mostly rely on appropriateness as a substantial deviation from business-as-usual. The proposed revised EU LULUCF Regulation foresees an 8% non-compliance penalty for the unabated amounts to be applied to the period post-2030. This does not signal strong enforcement, even if activated. For comparison, the Kyoto Protocol foresaw a 30% non-compliance penalty to be applied to subsequent compliance periods, and negotiating future obligations allowed member states to adjust future ambitions, thereby relieving the penalty of its stick function. Functionally, the LULUCF non-compliance procedure is a repetition of a design error of the Kyoto Protocol's sanctioning mechanism – and this was very well known to negotiators of the Kyoto Protocol as one of the authors observed *in situ*.

How a two-third increase in net carbon sink capacity can materialise in the presence of ageing (and thereby less carbon-absorbing) forests in several member countries remains an issue to be resolved by the European Commission and the EU governance system. Resolving this issue will be key to achieving the objectives of the European Green Deal.

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Note

1 Most of the literature, including the Intergovernmental Panel on Climate Change (IPCC) reports, recognises trees as a nature-based solution for the efficient and cost-effective absorption of CO_2. Moreover, afforestation and reforestation are considered as prominent negative emission technologies to be deployed on a large scale.

References

Agora Verkehrwende – Agora Energiewende. (2018). *Die Kosten von unterlassenem Klimaschutz für den Bundeshaushalt. Die Klimaschutzverpflichtungen Deutschlands bei Verkehr, Gebäuden und Landwirtschaft nach der EU-Effort-Sharing-Entscheidung und der EU-Climate-Action Verordnung*. https://www.agora-energiewende.de/fileadmin2/Projekte/2018/Non-ETS/142_Nicht-ETS-Papier_WEB.pdf

Börzel, T. A., & Risse, T. (2012). From Europeanisation to diffusion: Introduction. *West European Politics*, *35*(1), 1–19. https://doi.org/10.1080/01402382.2012.631310

Böttcher, H., Zell-Ziegler, C., Herold, A., & Siemons, A. (2019). EU LULUCF Regulation explained: Summary of core provisions and expected effects. Berlin: The Öko-Institut. https://www.oeko.de/fileadmin/oekodoc/Analysis-of-LULUCF-Regulation.pdf

European Commission. (2008). Addressing the challenges of deforestation and forest degradation to tackle climate change and biodiversity loss – Communication from the commission to the European Parliament, the Council, the European Economics and Social Committee and the Committee of the Regions. (COM(2008) 645 final). Brussels: Commission of the European Communities. https://eur-lex.europa.eu/legal-content/en/TXT/?uri=CELEX%3A52008DC0645

European Commission. (2013). Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions: A new EU Forest Strategy: For Forests and the Forest-Based Sector (COM(2013) 659 final). Brussels. https://eur-lex.europa.eu/resource.html?uri=cellar:0d918e07-e610-11eb-a1a5-01aa75ed71a1.0001.02/DOC_1&format=PDF, https://eur-lex.europa.eu/resource.html?uri=cellar:0d918e07-e610-11eb-a1a5-01aa75ed71a1.0001.02/DOC_2&format=PDF

European Commission. (2018). Regulation (EU) 2018/841 of the European Parliament and of the Council of 30 May 2018 on the inclusion of greenhouse gas emissions and removals from land use, land use change and forestry in the 2030 climate and energy framework, and amending Regulation (EU) No 525/2013 and Decision No 529/2013/EU. Official Journal of the European Union. https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=OJ:L:2018:156:TOC

European Commission. (2020a). Commission staff working document, impact assessment: Stepping up Europe's 2030 climate ambition – Investing in a climate-neutral future for the benefit of our people. (SWD(2020) 176 final, Part 2/2). Brussels: European Commission. https://eur-lex.europa.eu/resource.html?uri=cellar:749e04bb-f8c5-11ea-991b-01aa75ed71a1.0001.02/DOC_2&format=PDF

European Commission. (2020b). Proposal for a regulation of the European parliament and of the council establishing the framework for achieving climate neutrality and amending regulation, (EU) 2018/1999 (European Climate Law). (2020/0036 (COD)). Brussels: European Commission. https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52020PC0080&from=EN

European Commission. (2020c). State of the union: Questions & answers on the 2030 climate target plan. Brussels: European Commission. https://ec.europa.eu/commission/presscorner/api/files/document/print/en/qanda_20_1598/QANDA_20_1598_EN.pdf

European Commission. (2020d). Stepping up Europe's 2030 climate ambition – Investing in a climate-neutral future for the benefit of our people. (COM(2020) 562 final). Brussels: European Commission. https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52020DC0562&from=en

European Commission. (2021a). Communication from the commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions: New EU forest strategy for 2030 (COM(2021) 572 final). Brussels. https://eur-lex.europa.eu/resource.html?uri=cellar:0d918e07-e610-11eb-a1a5-01aa75ed71a1.0001.02/DOC_1&format=PDF, https://eur-lex.europa.eu/resource.html?uri=cellar:0d918e07-e610-11eb-a1a5-01aa75ed71a1.0001.02/DOC_2&format=PDF

European Commission. (2021b). 'Fit for 55': Delivering the EU's 2030 climate target on the way to climate neutrality. (COM(2021) 550 final). Brussels: European Commission.

https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52021DC0550&from=EN

European Commission. (2021c). Regulation of the European Parliament and the Council Amending Regulations (EU) 2018/841 as regards the scope, simplifying the compliance rules, setting out the targets of the Member States for 2030 and committing to the collective achievement of climate neutrality by 2035 in the land use, forestry and agriculture sector, and (EU) 2018/1999 as regards improvement in monitoring, reporting, tracking of progress and review. (COM/2021/554 final). Brussels. https://eur-lex.europa.eu/resource.html?uri=cellar:ea67fbc9-e4ec-11eb-a1a5-01aa75ed71a1.0001.02/DOC_1&format=PDF, https://eur-lex.europa.eu/resource.html?uri=cellar:ea67fbc9-e4ec-11eb-a1a5-01aa75ed71a1.0001.02/DOC_2&format=PDF

European Commission. (2021d). Nature and forest strategy factsheet. (FS/21/3670/2021). Brussels: European Commission. https://ec.europa.eu/commission/presscorner/detail/en/fs_21_3670

European Commission. (2021e). Proposal for amending Directive (EU) 2018/2001 of the European Parliament and of the Council, Regulation (EU) 2018/1999 of the European Parliament and of the Council and Directive 98/70/EC of the European Parliament and of the Council as regards the promotion of energy from renewable sources, and repealing Council Directive (EU) 2015/652. (COM(2021) 557 final). Brussels: European Commission. https://ec.europa.eu/info/sites/default/files/amendment-renewable-energy-directive-2030-climate-target-with-annexes_en.pdf

European Commission. (2021f). Joint Research Centre, Camia, A., Giuntoli, J., & Jonsson, R. The use of woody biomass for energy production in the EU. Publications Office of the European Union. https://dx.doi.org/10.2760/831621

Kurze, K. (2020). Die internationale Klimapolitik nach Paris: EU-Leadership auf dem Prüfstand. *Zeitschrift für Außen- und Sicherheitspolitik*, *13*(4), 357–378. https://doi.org/10.1007/s12399-020-00827-4

Leijten, J. (2019). *How does the LULUCF Regulation affect EU member states' forest management?* https://brussels-school.be/publications/policy-briefs/how-does-lulucf-regulation-affect-eu-member-states%E2%80%99-forest-management

Magalhães, J. G. D. S., Amoroso, M. M., & Larson, B. C. (2021). What evidence exists on the effects of competition on trees' responses to climate change? A systematic map protocol. *Environmental Evidence*, *10*(1), 34. https://doi.org/10.1186/s13750-021-00249-5

March, J. G., & Olsen, J. P. (1998). The institutional dynamics of international political orders. *International Organization*, *52*(4), 943–969. http://doi.org/10.1162/002081898550699

Pirlot, P., Delreux, T., & Farcy, C. (2018). Forests: A multi-sectoral and multi-level approach to sustainable forest management. In C. Adelle, K. Biedenkopf, & D. Torney (Eds.), *European Union external environmental policy: Rules, regulation and governance beyond borders* (pp. 167–187). Springer International Publishing. https://doi.org/10.1007/978-3-319-60931-7_9

Rogal, A. (2021, July 20). Fit for 55/2030: MEPs underwhelmed by new EU forest strategy. *The Parliament Magazine*. https://www.theparliamentmagazine.eu/news/article/fit-for-552030-meps-underwhelmed-by-new-eu-forest-strategy

Savaresi, A., Perugini, L., & Chiriacò, M. V. (2020). Making Sense of the LULUCF Regulation: Much ado about nothing? *Review of European, Comparative & International Environmental Law*, *29*(2), 212–220. https://doi.org/10.1111/reel.12332

Savaresi, A., & Perugini, L. (2021). Balancing emissions and removals in the land sector: The view from the EU. *Carbon and Climate Law Review*, *15*(1), 49–59. https://doi.org/10.21552/cclr/2021/1/7

Schlacke, S., Wentzien, H., Thierjung, E.-M., & Köster, M. (2022). Implementing the EU climate law via the 'fit for 55' package. *Oxford Open Energy*, *1*. https://doi.org/10.1093/ooenergy/oiab002

Sotirov, M., Winkel, G., & Eckerberg, K. (2021). The coalitional politics of the European Union's environmental forest policy: Biodiversity conservation, timber legality, and climate protection. *Ambio*, *50*(12), 2153–2167. https://doi.org/10.1007/s13280-021-01644-5

Sprinz, D. F. (2009a). Long-term environmental policy. Special Issue of *Global Environmental Politics*, *9*(3). https://direct.mit.edu/glep/issue/9/3

Sprinz, D. F. (2009b). Long-term environmental policy: Definition, knowledge, future research. *Global Environmental Politics*, *9*(3), 1–8. https://doi.org/doi:10.1162/glep.2009.9.3.1

Torney, D., Biedenkopf, K., & Adelle, C. (2018). Introduction: European Union external environmental policy. In C. Adelle, K. Biedenkopf, & D. Torney (Eds.), *European Union external environmental policy: Rules, regulation and governance beyond borders* (pp. 1–15). Springer International Publishing. https://doi.org/10.1007/978-3-319-60931-7_1