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Forest-Based Bioenergy: Fit for Climate Change Mitigation?

An Analysis of the EU Legal Regime of Forest-Based Bioenergy

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Abstract

Forest-based bioenergy plays a key role in the energy transition and in meeting the EU renewable energy targets. Indirectly promoted by the EU legislation, forest biomass demand is increasing while European forest sinks are decreasing.

To prevent forest-based bioenergy from exacerbating climate change instead of being part of the solution to mitigate it, the Renewable Energy Directive II and the LULUCF Regulation introduced specific safeguards. However, these safeguards have proven to be insufficient and inadequate, leading the EU legislation on forest-based bioenergy to potentially enhance climate change by increasing GHG emissions and failing to protect carbon sinks.

The 'Fit for 55' proposed amendments to the Renewable Energy Directive II and to the LULUCF Regulation currently under consideration by the European Parliament and the Council, appear to remedy some of the shortcomings identified, albeit still being insufficient.

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Abbreviations

CO2	Carbon dioxide
CJEU	Court of Justice of the European Union
EU	European Union
FRL	Forest Reference Level
GHG	Green House Gases
IPCC	Intergovernmental Panel on Climate Change
JRC	Joint Research Centre
LULUCF	Land-Use, Land-Use Change and Forestry
NDC	National Determined Contribution
RED	Renewable Energy Directive
TFEU	Treaty on the Functioning of the European Union
UNFCCC	United Nations Framework Convention on Climate Change

1. Introduction

1.1. Background

In December 2019, the European Commission introduced the European Green Deal with the core goal to become 'climate neutral' by 2050.[1] This means ensuring no net emissions of greenhouse gases (GHG). The Green Deal aligns the European Union (EU) with the Paris Agreement's[2] global temperature goal to hold 'the increase in the global average temperature to below 2-degree Celsius above pre-industrial levels and to pursue efforts to limit temperature increase to 1.5 degree Celsius above pre-industrial levels.'[3]

To achieve this goal, the EU needs to transition from today's energy system to an integrated energy system largely based on renewables already by 2030.[4] For the energy sector, becoming 'climate neutral' by 2050 entails a drastic transition from fossil fuels to decarbonized energy. Indeed, the energy production accounts for more than 75% of the EU GHG emissions.[5]

This shift is materialised through two important legally binding targets for 2030. These targets are interim milestones that have been introduced by the EU under the '2030 Climate Target Plan' to pave the path to climate neutrality.[6] First, the reduction of GHG emissions by 55% compared to 1990 levels by 2030 included in the EU Climate law[7] and second, an increase of at least 32% of renewable energy in final energy consumption in the EU energy mix by 2030.[8]

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[1] COM(2019) 640 final, at.1

[2] Paris Agreement (adopted 12 Dec. 2015, entered into force 4 Nov. 2016) 55 ILM 740

[3] Paris Agreement, Article 2(a)

[4] COM(2020) 562 final

[5] International Energy Agency 2021 p.13

[6] European Commission, '2030 Climate Target Plan' https://ec.europa.eu/clima/eu-action/european-green-deal/2030-climate-target-plan_en (last accessed 17 February 2022)

[7] Regulation (EU) 2021/1119 of the European Parliament and of the Council of 30 June 2021 establishing the framework for achieving climate neutrality and amending Regulations (EC) No 401/2009 and (EU) 2018/1999 [2021] OJ L243/1 (European Climate Law), Articles 2 and 4.

[8] Directive (EU) 2018/2001 of the European Parliament and of the Council of 11 December 2018 on the promotion of the use of energy from renewable sources [2018] OJ L328/82. (RED II), Article 3(1)

Bioenergy[9] plays a central role in this transition. Indeed, it is the largest source of renewable energy in the EU, representing around 55% of the final renewable energy consumption and is expected to increase in the future to reach the above-mentioned targets.[10] The role of forests is central as woody biomass represents 75% of the bioenergy consumption in the EU.[11]

This central role of forests in the supply of bioenergy is the result of the inclusion of forest-based bioenergy in the list of renewable energy sources and of its promotion in the Renewable Energy Directive II (RED II)[12] and in the EU 2030 Climate and Energy Framework.[13]

The European Commission defines bioenergy as 'the result of the conversion of biomass resources, such as trees, plants, forest residues, into energy and energy-carriers including heat, electricity and transport fuels. As biomass can regrow, EU law considers it a renewable energy'.[14] Forest-based bioenergy is viewed as an expedient source in the EU, which does not have the intermittency constraints of other sources of renewable energy, such as solar or wind power.[15]
Therefore, and while there is no stated target for the production or consumption of forest-based bioenergy, its demand is associated with targets for the promotion of renewable energy and to support schemes so is therefore increasing.[16] Consequently, there is an increased pressure on European forests as a source of renewable energy.

However, additionally to being a source of energy participating in the energy

[9] Bioenergy refers to the energy produced from biomass

[10] Smith et al. 2021 p.11

[11] Smith et al. 2021 p.11

[12] Directive (EU) 2018/2001 of the European Parliament and of the Council of 11 December 2018 on the promotion of the use of energy from renewable sources [2018] OJ L328/82. (RED II)

[13] European Commission '2030 Climate & Energy Framework', https://ec.europa.eu/clima/eu-action/climate-strategies-targets/2030-climate-energy-framework_en (last accessed 10 February 2022)

[14] European Commission 'Common agricultural policy and bioenergy', https://ec.europa.eu/info/food-farming-fisheries/sustainability/economic-sustainability/bioeconomy/cap-and-bioenergy_en (last accessed 14 February 2022)

[15] *Ibid.*

[16] Joint Research Centre 2021, p.91

transition, forests also play a two-fold role. Firstly, they act as carbon sinks which are described as a 'mechanism that removes a greenhouse gas […] from the atmosphere'[17] and thus contribute to climate change mitigation. Secondly, forests are sources of emissions as they release GHG into the atmosphere in certain circumstances (human activities such as harvesting, fires etc.).[18] Forest-based bioenergy can enhance carbon emissions and thus contribute to the very problem it is seeking to resolve.

In the EU, the Land-Use, Land-Use Change and Forestry (LULUCF) sector is currently a net carbon sink but projections show that it is rapidly declining[19] due to ageing forests, increase in forests harvest to meet the raising demand for forest biomass and because of climate change related pressures on forests.[20] Therefore, a regulatory framework that simultaneously protects and enhances sinks and reduces GHG emissions stemming from the use of forest biomass is needed for forest-based bioenergy to contribute to the EU's climate change mitigation strategy without compromising its carbon integrity.
This is the role of the two pieces of EU legislation covering forest-based bioenergy. On one hand, the RED II which focuses on energy measures and establishes sustainability, GHG emission savings and LULUCF criteria. On the other hand, the LULUCF Regulation[21] establishing a GHG emissions accounting system and focusing on the protection and preservation of forests as carbon sinks.

However, shortcomings in these instruments reveal the emergence of a conflict of objectives. While on paper the EU legislation on bioenergy is aimed at preserving forests and tackling climate change through the conservation of carbon sinks and the

[17] LULUCF Regulation, Article 3(1)

[18] LULUCF Regulation, Article 3(2)

[19] Öko-Institut 2021 p.10

[20] Öko-Institut 2021 p.10

[21] 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 [2018] OJ L156/1. (LULUCF Regulation)

reduction of emissions[22], in practice it might increase GHG emissions and fail to preserve forests from the adverse effects of the production of bioenergy.

In order for the EU legislation to meet the increased targets introduced with the Green Deal, the European Commission has proposed a series of legislative reforms, known as the 'Fit for 55' package.[23] This package includes a revision of both the RED II and the LULUCF Regulation. In February 2022, the Parliament has presented its draft reports - which will serve as basis of the parliament's position on the Commission's proposal - and which include proposed amendments to the proposals. These proposed amendments, while not definitively adopted, seem to unravel the EU Commission proposal on both the RED II and the LULUCF Regulation and suggest that fierce negotiations lay ahead. Ultimately, these reforms are meant to addresses some of the observed shortcomings regarding forest-based bioenergy.

1.2. Research questions and objective

This thesis aims at understanding how the EU legal regime of forest-based bioenergy can become fit for climate change mitigation. To answer this question, the thesis addresses the following sub-questions:

- What is the current regulatory framework applicable to forest-based bioenergy?
- What shortcomings can be identified in this framework?
- How is the European Commission addressing these shortcomings in the RED II and LULUCF revision proposals?

1.3. Methodology

This thesis follows a doctrinal approach to analyse the EU legal regime applicable to forest-based bioenergy, namely the Renewable Energy Directive II and the Land-Use,

[22] LULUCF Regulation, Recital 7

[23] European Parliament, 'Legislative Train fit for 55 package under the European Green Deal' (2021) <https://www.europarl.europa.eu/legislative-train/theme-a-european-green-deal/package-fit-for-55> (last accessed 12 February 2022).

Land-Use Change and Forestry Regulation. As defined by Smits, doctrinal legal research is used to give 'a systematic exposition of the principles, rules and concepts governing a particular legal field […] with a view to solving unclarities and gaps in the existing law'. [24] This thesis analyses the rules and concepts at the basis of the legal framework and the interplay between the above-mentioned legislation to identify their ambiguities.

Using a socio-legal research approach, which can be described as the 'studies [of] legal phenomena using social scientific theories and methods'[25], the thesis further examines how the legal regime governing forest-based bioenergy works in practice and the impacts it has on EU climate mitigation. This analysis is necessary to identify and understand the shortcomings in the regulatory framework, which provide the basis to analyse the recent European Commission's proposals to reform the framework.

1.4. Sources of law

As regards to the primary sources of law, additionally to the EU legislation and more specifically the RED II and the LULUCF Regulation, two contentious cases – the so called 'People's Climate Case' and 'Biomass case' - lodged before the Court of Justice of the European Union (CJEU) are being used to conduct the analysis of the shortcomings in the existing law. These cases are not comprehensively analysed in this thesis; only the arguments made in these cases, which are relevant to the subject matter of this thesis are examined.

Furthermore, this thesis analyses the reform of the RED II and the LULUCF Regulation introduced by the European Commission in the framework of the 'fit for 55' package. This being an on-going law-making process, this thesis includes developments that occurred up to the 25 February 2022, when the Parliament issued its draft opinions on the European Commission proposals.[26]

Secondary sources of law such as official communications from the European

[24] Smiths 2015, p. 5

[25] Kai Kokko 2015, p.307

[26] This is the date of the latest updates on the proposals

Commission, academic literature, journal articles and NGO reports are used across this thesis as a basis for interpretation and argumentation.

Finally, because this thesis is analysing the law at EU level, the Nordic perspective is introduced by looking at the influence that Sweden and Finland had on the current legislation and their positions on existing and proposed EU legislation.

1.5. Limitations

While there are various sources of bioenergy such as crop-based biomass, animal manure or food waste, this thesis only focuses on forest-based bioenergy. This choice is justified by the issues arising from the dual role of forests (sink and source) and its implications. It is also justified by the prominent role that forest-based bioenergy plays in Nordic States, especially in Sweden and Norway, and more broadly in the EU Member States.

Additionally, this thesis looks at the questions arising from the use of bioenergy in the EU from a climate change perspective and will not focus on its other impacts, such as on biodiversity. This is justified by the complexity of the climate aspect on this topic and great deal of analysis and research it requires.

Finally, the scope of this thesis only covers the use of bioenergy in electricity, heating and cooling but will not address its use in the transport sector.

1.6. Structure

Following this introductory chapter, chapter 2 describes the EU regulatory framework governing forest-based bioenergy focusing on the RED II and the LULUCF Regulation. Chapter 3 assesses and discusses the shortcomings of this regulatory framework. Chapter 4 considers whether the reform proposals introduced by the European Commissions address the shortcomings brought to light in chapter 3. Chapter 5 summarizes the main points of the thesis and reflects on whether or not the EU legal regime governing forest-based bioenergy is fit for climate change mitigation.

2. The regulation of forest-based bioenergy: a complex legal framework straddling between the RED II and the LULUCF Regulation

2.1. Forest-based bioenergy under the Renewable Energy Directive II

2.1.1. The emergence of the RED II rules on bioenergy

To understand the RED II's role in regulating forest-based bioenergy, it is important to first briefly look at what preceded it and the context of its adoption.

The Renewable Energy Directive I (RED I)[27], adopted in 2009 provided a framework fostering the use of renewable energy. Its goal was to achieve a share of 20% of renewable energy in the EU's energy mix by 2020.[28]
To achieve this Union wide target, each Member State was given a national legally binding target, which was calculated on the basis of its share of energy from renewable sources in 2005.[29]

Regarding bioenergy, a report from the Commission on sustainability requirements for the use of solid and gaseous biomass[30] shows that, at that time, the sustainability risks of bioenergy were deemed to be low by the European Commission.
Consequently, the European Commission did not recommend binding safeguards at EU level against the potential adverse effects of the production of bioenergy. Instead, to respond to the sustainability concerns and avoid negative impacts on forests carbon stocks, the European Commission encouraged Member States to develop national 'sustainability schemes' for solid biomass.[31]

[27] Directive 2009/28/EC of the European Parliament and of the Council of 23 April 2009 on the promotion of the use of energy from renewable sources and amending and subsequently repealing Directives 2001/77/EC and 2003/30/EC [2009] OJ L140/16 (RED I)

[28] RED I, Article 3(1)

[29] RED I, Article 3(1); RED II, Annex I

[30] COM(2010) 11 final.

[31] COM(2010) 11 final, at 3.1

This flexibility given to Member States was justified by the difficulty to establish a harmonized scheme and consistent sustainability compliance mechanisms for solid biomass given the different raw materials used in different Member States.[32]

Following the implementation of the RED I, some concerns were raised and the European Commission warned Member States that 'the expected increase of demand for domestic and non-EU biomass feedstock warrants vigilance in how far and in what way the expected expansion will impact on carbon stocks in forests'.[33]
Furthermore, concerns were raised about the negative impacts of large-scale biomass use in heat and power sectors in the EU as well as in third countries; the disparity of sustainability schemes across Member States and the potential negligible or even negative impacts of the use of bioenergy on EU emissions.[34] Therefore, the European Commission suggested that 'an improved biomass policy will also be necessary to maximize the resource efficient use of biomass in order to deliver robust and verifiable greenhouse gas savings […].'[35]
Hence, and also because of necessary amendments of other parts of the Directive, an overhaul of the RED I was introduced through the RED II in 2018.

2.1.2. The RED II safeguards

The main goals of the RED II regarding forest-based bioenergy are to minimize the risk of using unsustainable forest biomass for the production of bioenergy[36] as well as to minimize the risk of negative impacts on forest carbon stocks.[37] Recital 102 of the RED II indeed provides that 'to ensure that, despite the growing demand for forest biomass, harvesting is carried out in a sustainable manner in forests where regeneration is ensured […] and that carbon stocks are tracked […] operators should take the appropriate steps in order to minimise the risk of using unsustainable forest biomass for the production of bioenergy.'

[32] COM(2010) 11 final, at 3.1

[33] COM(2010) 11 final, at 2.1

[34] SWD(2016) 416 final, p.30

[35] COM(2014) 15 final, at 2.2

[36] RED II, Article 29(6)

[37] RED II, Article 29(7)

To achieve these goals, three sets of criteria have been developed: the sustainability criteria, the LULUCF criteria and the GHG emission savings criteria. Bioenergy produced by Member States is only taken into account as contributing towards the EU's renewable energy target (32%) and to Member States' renewable energy shares only if it fulfils these criteria.

Likewise, bioenergy can only be eligible for financial support if it meets these criteria.[38] Therefore, meeting the sustainability criteria, the LULUCF criteria and the GHG emission savings criteria is crucial for Member States that wants to rely on bioenergy to meet their renewable energy targets.

The RED II offers two alternative ways to demonstrate compliance (often referred to as 'level A' and 'level B'). A first level when national or subnational legislation is in place and a second level where, in absence of national or subnational legislation, the country of origin can demonstrate compliance through the presence of management systems.

2.1.3. The sustainability criteria and the protection of forests

The aim of the sustainability criteria is to ensure that the harvesting of woody products for the production of bioenergy is done in such a way as to minimize the risk of harming forests.

Under level A, the sustainability criteria require that the country of origin of the biomass (i.e. the country where the biomass is harvested) has laws and monitoring and enforcement systems in place to (i) ensure the legality of harvesting operations, (ii) forest regeneration of harvested areas (iii) protects areas managed for nature protection purposes (iv) minimize impacts of harvesting on biodiversity and (v) maintain or improve the long-term production capacity of the forest.[39]

Alternatively, under level B, the country of origin must demonstrate that management systems are in place to ensure that the above-mentioned criteria are fulfilled.[40]

[38] RED II, Article 29(1) a-c

[39] RED II, Article 29(6)(a) (i)-(v)

[40] RED II, Article 29(6)(b)(i)-(v)

On the scope of application, article 29(1) RED II states that these criteria only apply to installations producing electricity, heating and cooling equal or exceeding 20 MW in the case of solid biomass fuels such as forest-based biofuels. This limitation was justified by a desire to minimise administrative burden.[41] Member States can however decide to extend the application of the sustainability criteria to installations having a capacity below 20 MW.[42]
Furthermore, in the absence of the mention 'in operation by' present in other provisions, it is understood that the sustainability criteria apply to all facilities, new and existing.

2.1.4. The LULUCF criteria and the protection of carbon sinks

The RED II establishes a link between renewable energy and the LULUCF sector with regards to forest-based bioenergy. One of the rationale behind this link is the fact that the LULUCF Regulation only applies to EU Member States, so these criteria are meant to encompass both EU Member States and third countries that export forest biomass to the EU to ensure that forest carbon stocks and sinks are protected beyond the EU borders.[43] Therefore, the RED II resorts to the Paris Agreement and the NDCs to ensure that imported forest biomass from outside the EU, which is a challenge to control, is also covered by safeguards.

Accordingly, the RED II established the LULUCF criteria[44] with the aim of minimizing the risk of negative impacts on forest carbon stocks. In other words, it aims at ensuring that States harvesting forests for the production of bioenergy have mechanisms in place to account for the effects on carbon stocks.
In order for bioenergy to count towards the achievement of renewable energy targets, the country of origin of the forest biomass must fulfil the following cumulative criteria (level A).

[41] RED II, Recital 104

[42] RED II, Article 29(1)

[43] Booth and Mitchell 2020, p.39

[44] RED II, Article 29(7)(a)(i)

First, it must be a party to the Paris Agreement (i.e. have ratified the treaty).[45] Second, it must have submitted a Nationally Determined Contribution (NDC) which encompasses emissions and removal from forestry and ensures that the changes in the carbon stock related to biomass harvest are accounted for.[46] This ensures that the climate impacts related to the harvest will be mirrored in the harvesting country's national GHG inventories.[47]

Alternatively, if the party has not submitted an NDC or if its NDC does not ensure accounting of emissions and removals, the RED II provides for the possibility to meet the LULUCF criteria by having 'national or sub-national laws in place applicable in the area of harvest to conserve and enhance carbon stocks and sinks', providing evidence that reported LULUCF sector emissions do not exceed removals'.[48] This alternative is justified by the need of having evidences that imported forest biomass does not hamper carbon stocks and sinks outside of the EU.

Finally, a third possibility is offered to States of origin that are not party to the Paris Agreement. The latter must have management systems in place 'to ensure that carbon stocks and sinks levels in the forest are maintained, or strengthened over the long term' (level B).[49] This alternative has been introduced because the United States, which is the most important supplier of wood pellet to the EU, was planning on the Paris Agreement. Therefore, this provision was a way to ensure that US wood pellets would still fall within the scope of admissible bioenergy fuels under the RED II.[50]

To complete this set of criteria, the RED II provides for GHG emission savings criteria.

[45] United Nations. (1969).Vienna Convention on the Law of Treaties. Treaty Series, 1155, 331, Article 2(1)(g)

[46] RED II, Article 29(7)(a)(ii)

[47] Joint Research Centre 2021, p.93

[48] RED II, Article 29(7)(a)(ii)

[49] RED II, Article 29(7)(b)

[50] Booth and Mitchell 2020, p.39

2.1.5. The GHG emission savings criteria and the performance of bioenergy

The aim of the GHG emission savings criteria is to ensure that forest-based bioenergy performs better in terms of GHG emissions than fossil fuel. This is implied through the calculation methods established by RED II in article 31.
To achieve this aim, GHG emission savings from the use of biomass must be at least 70% for installations starting operation between 1 January 2021 and 31 December 2025 and 80 % for installations starting operation from 1 January 2026, compared to fossil fuel.[51]

These criteria only apply to very recent and new installations as article 29(10) specifies 'starting operations' in 2021. The scope of application is further narrowed as these criteria only apply to 'electricity and heating from biomass fuels produced in installations with a total rated thermal input equal to or exceeding 20 MW' in order to minimize administrative burden.[52]

Finally, it is noteworthy that when calculating the emissions saved by the use of bioenergy compared to the use of fossil fuel, the emissions of CO2 stemming from the use of bioenergy are accounted as zero in the equation.[53] In other words, the combustion of woody biomass for forest-based bioenergy is not accounted for under RED II. The latter matter is left to the LULUCF Regulation.

2.2. The treatment of bioenergy under the LULUCF Regulation

As touched upon in the introduction, the LULUCF sector plays an important role in the production of bioenergy. In this context, the LULUCF Regulation is key to ensure that forest-based bioenergy contributes to climate change mitigation. To do so, the LULUCF Regulation sets a GHG emissions requirement (the so-called 'no-debit rule') and establishes GHG accounting rules to assess, amongst others, the impact of

[51] RED II, Article 29(10)(d)

[52] RED II, Recital 104

[53] RED II, Article 31(1) and Annex VI, B, (13)

the production of bioenergy on carbon stocks. However, designing these rules has not been easy.

2.2.1. The LULUCF sector: a complex field to regulate

The LULUCF sector is rather difficult to regulate. First, quantifying GHG emissions and removals in the LULUCF sector to assess the impacts of the production of bioenergy on the carbon stocks and in turn the climate change mitigation outcomes is a complex task. Indeed, unlike other sectors, forests are affected concurrently by natural disturbances such as fires, human-induced actions such as harvesting as well as age-related considerations (i.e. the natural aging of forests that results in the absorption of less CO2).[54] It is therefore difficult to separate the impacts of human activities on forests from natural phenomena. It is also complicated to measure the impact of increased forestry on the atmosphere as forest GHG emissions fluctuate over time. [55]

From a political perspective, some authors have noted how the LULUCF sector is closely interlinked with 'sensitive areas of the *acquis* such as agriculture, forestry and renewable energy from biomass – in which the EU has historically exercised only limited competences.'[56] Additionally, there are great disparities between Member States regarding the use of forests for the production of bioenergy. Some Member States such as Finland and Sweden strongly rely on forest-based bioenergy for economical purposes, while others do not, or at least to a lesser extent.[57]

Balancing these diverging interests while also taking into consideration the environmental role played by forests is rather tricky when dealing with the increasing demand for bioenergy due to growing need for renewable energy to meet the EU targets.[58]

[54] Grassi et al. 2018 p.2

[55] Romppanen 2020, 'The LULUCF Regulation: the new role of land and forests in the EU climate and policy framework' p.262

[56] Savaresi et al. 2020 p.213

[57] Savaresi et al. 2020 p.213

[58] Romppanen 2021 p.3

2.2.2. The emergence of the third pillar of the 2030 Climate and Energy Framework

It is in this complex context that the LULUCF Regulation negotiations took place in 2014. At that time, two options were considered. The LULUCF could either be included in the Effort Sharing Decision (i.e. building, transport, waste)[59] or it could be established as a stand-alone pillar in EU climate policy. After lengthy and heated debate, agreement was reached on a hybrid approach where the LULUCF sector would be regulated through a stand-alone Regulation, but with flexibilities with the ETS and Effort Sharing sectors.[60]

Thus, the third pillar of the EU 2030 Climate and Energy Policy Framework emerged. This has been described as 'a major step forward in establishing a holistic climate policy for Europe'[61] which prompt Member States to reduce GHG emissions and expand removals in the LULUCF sector.[62]

It is considered a major step because the LULUCF sector started to contribute to the achievement of the EU 2030 target of then 40%, now 55% reduction in GHG emissions. This means that emissions stemming from the production of bioenergy and the removals by forests have to be accounted for.

Reaching the EU overall emissions reduction target entails to preserve carbon sinks. This is planned to be achieved by the LULUCF Regulation through the legally binding 'no-debit rule'[63] and the establishment of carbon sinks accounting rules.

2.2.3. The accounting rules for bioenergy GHG emissions

The aim of the LULUCF Regulation is to reach a balance between emissions and removals ('no-debit rule'). In other words, the LULUCF sector should not be a net source of emissions.

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[59] Decision No 406/2009/EC of the European Parliament and of the Council of 23 April 2009 on the effort of Member States to reduce their greenhouse gas emissions to meet the Community's greenhouse gas emission reduction commitments up to 2020 OJ L 140, 5.6.2009, p. 136–148

[60] Romppanen 2019 p.2; Savaresi et al. 2020 p.214, COM(2021) 554 final p.7

[61] Romppanen 2020, 'The Bioenergy 'Blind Spots' in EU Climate and Energy Law' p.156

[62] Nabuurs et al. 2018, p.2

[63] LULUCF Regulation, Article 4

To achieve this balance between emissions and removals, specific accounting rules and flexibility mechanisms have been established, taking into account the complexity of assessing the climate change mitigation outcomes in the LULUCF sector.
It is important to recall that these rules emerged after intensive negotiations that attempted to reconcile Member States diverging opinions on how emissions and removals should be accounted for.[64] It is also noteworthy that the EU was at the forefront in establishing a more comprehensive system for accounting in the LULUCF sector which it announced in its 2015 Intended NDC.[65]

It is essential to underline that accounting for bioenergy emissions lies between the RED II and the LULUCF Regulation.[66] Therefore, there is an interplay between these two instruments as regards to accounting.
This is understood from recital 15 of the LULUCF Regulation which states that 'emissions from the combustion of biomass can be accounted for as zero in the energy sector [RED II] on condition that such emissions are accounted for in the LULUCF sector'. This further arise from the RED II Annex VI which states that 'emissions of CO2 from fuel in use, shall be taken to be zero for biomass fuels'.[67]
Concretely, this means that the combustion of forest-based biomass is not accounted for. Instead, what is accounted for are the emissions stemming from the harvest of the woody products under the LULUCF Regulation. Essentially, the RED II shifts responsibility for considering bioenergy's climate performance to the LULUCF Regulation.[68] The assumption behind this shift is that the emissions stemming from the combustion of bioenergy are compensated by the absorption of CO2 by forests. Therefore, they do not need to be accounted for.
This implies a huge trust on the emissions accounting mechanisms in place under the LULUCF Regulation. This responsibility is all the more important that accounting rules strongly impact the credibility of forest-related mitigation.[69]

[64] Romppanen 2019, p.1

[65] Savaresi and Perugini 2021, 'Balancing Emissions and Removals in the Land Sector: The View from the EU' p.59; Latvian Presidency of the Council of the European Union 2015, p.3

[66] Romppanen 2020, 'The Bioenergy 'Blind Spots' in EU Climate and Energy Law' p.155

[67] RED II, Annex VI, B, (13)

[68] Romppanen 2020, 'The Bioenergy 'Blind Spots' in EU Climate and Energy Law' p.160

[69] Joint Research Centre 2021, p.89

Scope: Under the LULUCF Regulation, the accounting of emissions is done per land categories and by Member State. Regarding the geographical scope, the scope of the accounting rules is harvested forests in the EU (i.e. in each Member State). Indeed, article 2(1) of the LULUCF Regulation provides that the 'Regulation applies to emissions and removals of the greenhouse gases […] *that occur* in any of the following land accounting categories *on the territories of Member States'*. This is important to highlight because, as explained further in chapter 3, the forest biomass used for bioenergy is also sourced outside of the EU.
As regards to land categories, the LULUCF Regulation encompasses, among others, 'managed forest land'.[70] This is the category relevant for this thesis as emissions from forest-based bioenergy are accounted under it.

Accounting tool: Currently, the key accounting tool ensuring that the emissions from forest biomass used for the production of bioenergy are accounted for is the Forest Reference Level (FRL). This instrument allows evaluating the impact, positive or negative, of the production of forest-based bioenergy on climate change mitigation.

The FRL is described by the LULUCF Regulation as an 'estimate […] of the average annual net emissions or removals resulting from managed forest land within the territory of a Member State in the periods from 2021 to 2025 and from 2026 to 2030 […].'[71] This estimate is based on a reference period (from 2000 to 2009) and on 'an extrapolation of forest management practices and intensity'[72] (i.e. assuming that no changes in the forest management practices occur).
The idea is to look at the evolution of carbon stocks compared to what they were in the historical period 2000-2009 (reference period). Once the FRL determined, Member States assess their levels of emissions and removals during the compliance periods 2021-2025 and 2026-2030 to infer their mitigation outcomes.[73] If it results from the calculations that the removals are higher than the emissions, credits are

[70] LULUCF Regulation, Article 2(1)(a)(iv)

[71] LULUCF Regulation, Article 3(1)(7)

[72] LULUCF Regulation, Recital 23

[73] Grassi et al. 2018, p.3

generated. Conversely, if emissions exceed removals, debits are generated.[74] This creates incentives or disincentives for Member States when establishing certain policies.[75]

What is crucial in this mechanism is that the forest reference level does not take into account the impact of existing and future policies. The LULUCF Regulation aims at separating human-induced actions such as forestry activities or expected increased demand for forest biomass to meet bioenergy needs from natural phenomenon, such as age-related characteristics.[76] The latter can be described as 'the state of maturity of the forest (e.g. age of a stand, its biomass density, and age or diameter class distribution)'.[77]

This accounting method allows capturing only the impact of policies and forest management practices. It also makes it possible to compare GHG emissions from the production of forest-based bioenergy in the LULUCF sector with those of other sectors which follow similar accounting methods.[78]

Criteria for FRLs: While the rules on FRL are very technical and complex some legal norms, which Member States must follow when determining their FRLs can be highlighted.[79] These are encompassed in the guiding criteria for determining forest reference level[80] and in the principles set out in article 8(5) of the LULUCF Regulation. They include, inter alia, 'forest management practice', 'sustainability', and the 'need to maintain, enhance and strengthen sinks'.[81]

Forest management practices: While Member States must include 'forest management practices' when determining their FRL, this term is not defined in the Regulation. The

[74] LULUCF Regulation, Recital 23

[75] Grassi et al. 2018, p.2

[76] Öko-Institut 2019, p.16

[77] European Commission 2018, p.9

[78] Grassi et al. 2018, p.10

[79] LULUCF Regulation, Article 8(4)

[80] LULUCF Regulation, Annex IV, A

[81] Romppanen 2020, 'The Bioenergy 'Blind Spots' in EU Climate and Energy Law' p.159

criterion is therefore based on 'an undefined set of management activities'.[82] The rationale behind this is to capture Member States' national circumstances and differences when managing forests.[83]

To assist Member States interpreting the criteria when determining their FRL, the European Commission issued a non-legally binding guidance document.[84] The latter provides a non-exhaustive list of examples of forest management practices including 'the schedule and intensity of thinning and final cut or soil preparation'. It can be inferred from this guiding document that 'forest management practices' refer to all activities taken to manage a forest.[85]

Sustainability: Article 8(5) provides that FRLs must be 'based on continuation of *sustainable* forest management practice'. The term 'sustainable' has been introduced after richly forested countries, like Finland, opposed the initial planned inclusion of the term 'intensity' because of their plans to increase the intensity of their forest management practice.[86] However, Recital 23, which can be used for the interpretation of the Regulation dispositions, maintained the reference to 'intensity', stating that 'the projected future removals by sinks should be based on an extrapolation of forest management practices *and intensity* from a reference period.'

Therefore, and while the content of the concept of 'sustainability' is nowhere to be found in the Regulation, Romppanen suggests that there is a tight link between the two concepts of intensity and sustainability.[87]

This is why the guiding document developed by the European Commission recommend including both qualitative and quantitative aspects of the forest management practices.[88]

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[82] Romppanen 2020, 'The LULUCF Regulation: the new role of land and forests in the EU climate and policy framework' p.275

[83] LULUCF Regulation, Recital 23

[84] European Commission 2018

[85] Romppanen 2020, 'The LULUCF Regulation: the new role of land and forests in the EU climate and policy framework' p.275

[86] *Ibid.* p.276

[87] *Ibid.*

[88] European Commission 2018, p.39

Need to maintain, enhance and strengthen sinks: Recalling verbatim the goal of the Paris Agreement to 'achieve a balance between anthropogenic emissions by sources and removals by sinks of greenhouse gases in the second half of this century'[89], the LULUCF Regulation requires Member States to take into account the evolution of the forest sinks to ensure their preservation and increase. Therefore, this criterion links the LULUCF Regulation to the Paris Agreement.

The European Commission guidelines shed some light on how this requirement can be understood. They provide that a temporary increase in the forest harvesting because of age maturity considerations can be justified if, in the long term, it leads to an increase of removal potential.[90] In practice, this means that first, Member States must be able to show that the increase in harvesting planned in their FLR is due to the forests reaching harvesting maturity.[91] Second, that the replacement of the harvested trees by young trees with higher long-term absorption potential will result in increased emissions removal. For example, Finland has been asked by the European Commission to prove that the change in harvesting intensity planned in their FRL was related to their forest age characteristics.[92]

It results from the above that in order to reflect the different ways Member States manage their forests, the LULUCF Regulation is rather vague on what need to be included in the FRLs and leaves a lot of discretion to Member States. The FRLs let Member States to develop practices in the way they think is the most appropriate in their countries, taking into account the climate change mitigation efforts they have to pursue.

The LULUCF accounting system is further complemented by flexibilities. These provide a degree of fungibility of the credits and debits generated to reach a balance between emissions and removals in the LULUCF sector.[93]

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[89] Paris Agreement, article 4(1), LULUCF Regulation, Recital 4

[90] European Commission 2018, p.89

[91] Romppanen 2020, 'The LULUCF Regulation: the new role of land and forests in the EU climate and policy framework' p.277

[92] SWD (2019) 213 final p. 32

[93] Kulovesi and Oberthür 2020, p.159

2.2.4. Flexibilities and increased harvest for forest biomass

To help them achieve the 'no-debit' requirement, Member States are given the possibility to use flexibilities. This means that Member States can balance their debits from the LULUCF sector with other sectors in the Effort Sharing sectors (such as building, waste, transport)[94]; within the LULUCF sector, between land categories[95]; or with other Member States[96]. In other words, net emissions in the LULUCF sector stemming from the calculation against the FRL must be balanced out by additional emission reductions in other sectors, countries or land categories.

Managed forest lands have specific flexibility rules. Member States are granted 'flexibility to temporarily increase their harvest intensity in accordance with sustainable forest management practices that are consistent with the objective set out in the Paris Agreement, provided that within the Union total emissions do not exceed total removals in the LULUCF sector'.[97] This means that a Member State can increase its harvest intensity if, without this increase, its sink could not be preserved and maintained in the long term and on the condition that this increase is in line with the international climate goals of the Paris Agreement.[98]

The inclusion of this specific flexibility system stem from the resistance of forest-rich countries such as Finland during the LULUCF negotiations (see 2.2.2).[99] The flexibility system was a way to accommodate Finland's concern that it might become a net emitter despite having an important sink in a system where the FRLs do not encompass policy assumptions, such as the future increased use of forest biomass for bioenergy.[100] The current accounting system therefore benefits countries such as Sweden and Finland which have an large forest sink as it allows them to increase

[94] LULUCF Regulation, Article 12(1)

[95] LULUCF Regulation, Article 8(2)

[96] LULUCF Regulation, Article 12(2)

[97] LULUCF Regulation, Recital 24

[98] Romppanen 2020, 'The LULUCF Regulation: the new role of land and forests in the EU climate and policy framework' p.282

[99] Öko-institut 2019, p.22

[100] *Ibid.*

harvesting to produce forest biomass and respond to the increase demand while balancing emissions in other sectors or land categories.[101]

The use of these flexibilities in the managed forest land category is conditional upon the fulfilment of two cumulative requirements. First, Member States must have 'included ongoing or planned specific measures to ensure the conservation or enhancement, as appropriate, of forest sinks and reservoirs'. [102] Second, the total emissions must not exceed the total removals in the managed forest land category at Union level.[103]

The level of compensation is also capped per Member State. The maximum amount of compensation is based on the reported average removals by sinks from forest land for the period from 2000 to 2009.[104] Additionally, to preserve the climate integrity of the system and not dilute the 2030 targets, the LULUCF sector's contribution to the target is capped at -225 million tons CO2 equivalent.[105]

It is noteworthy that Finland benefits from a special position as it is granted additional compensation.[106] Indeed, Finland can compensate up to 10 million tonnes of CO2 equivalent emissions.[107] This has been justified by the European Council by the fact that Finland, as the most richly forested country (75 per cent of total land area)[108], has limited possibilities of balancing emissions with removals [109] and that without increased harvesting, carbon sinks would turn into emission sources.[110] It is also

[101] Kulovesi and Oberthür 2020, p.159

[102] LULUCF Regulation, Article 13(2)

[103] LULUCF Regulation, Article 13(2)

[104] LULUCF Regulation, Article 13(3)(b) and Annex VII

[105] EU Climate Law, Recital 27

[106] LULUCF Regulation, Recital 26

[107] LULUCF Regulation, Article 13(4)

[108] Ministry of Agriculture and Forestry of Finland, 'Forest resources in Finland' https://mmm.fi/en/forests/forestry/forest-resources#:~:text=Forests%20cover%20more%20than%2075,per%20cent%20is%20privately%20owned (last accessed 21 February 2022)

[109] LULUCF Regulation, Recital 26

[110] Finnish Ministry of Agriculture and Forestry, 'Unanimous support from EU Member States to Finland's special allowance in LULUCF' (23 February 2021). https://valtioneuvosto.fi/en/-/1410837/unanimous-support-from-eu-member-states-to-finland-s-special-allowance-in-lulucf (last accessed 20 February 2022)

explained by the lobbying done by Finland, which argued that forestry must remain a national competence.[111] This additional compensation has been criticized by two NGOs, Fern and the Finnish Association for Nature Conservation (FANC), who argued that it would contribute to forest degradation already observed in the region. They also emphasized on the ironic situation where Finland and a few other countries asked for both financial support to protect and restore the forests and the right to increase logging.[112]

2.2.5. Intermediate conclusion

The LULUCF Regulation has been described as 'combining regulatory precision with the conferral of discretion on member states as to its implementation'[113] in order to incorporate Member States' diverging opinions on emissions and removals accounting rules. It has also been described as 'the most that was achievable under the prevailing political and regulatory conditions'.[114] The result of this is weak provisions leading to shortcomings.

[111] EU Observer, 'Finland fights to keep control of forests away from EU' (30 October 2019). https://euobserver.com/environment/146457 (last accessed 21 February 2022)

[112] EU Observer, 'Finland fights to keep control of forests away from EU' (30 October 2019). https://euobserver.com/environment/146457 (last accessed 21 February 2022)

[113] Romppanen 2020, 'The LULUCF Regulation: the new role of land and forests in the EU climate and policy framework' p.263

[114] Romppanen 2019, p.2

3. The shortcomings of the legal regime of forest-based bioenergy

3.1. The LULUCF Regulation

3.1.1. The carbon neutrality assumption

There is an interplay between the RED II and the LULUCF Regulation as regards to the accounting of GHG emissions stemming from the production of bioenergy.

As explained in the previous chapter, these GHG emissions are not accounted under RED II; they are instead accounted at harvest under the LULUCF Regulation. These rules arose from the Kyoto Protocol and the Intergovernmental Panel on Climate Change (IPCC) guidelines for National Greenhouse Gas Inventories.[115] The LULUCF Regulation explicitly refers to the IPCC guidelines and reiterates their accounting method in Recital 15.

The underpinning rationale for these rules is the assumption that forest-based bioenergy is carbon neutral. This assumption is not explicitly mentioned in the RED II or the LULUCF Regulation but is instead implied through the relationship between these two instruments.[116] It has however been explicitly mentioned in an European Commission report on the sustainability criteria for forest biomass, which stated that 'the combustion of biomass involves GHG emissions, but it is regarded as carbon neutral following the practice of the IPCC national inventory guidelines, where emissions from biomass are included in the energy sector for information only, and not added to the total.'[117]

This assumption presumes that burnt biomass only returns the carbon absorbed by growing plants to the atmosphere. In other words, the emissions from the combustion of forest-based bioenergy are 're-absorbed' by the regrowth of plants.[118] Therefore, the legislation considers that these emissions should not be accounted for.

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[115] IPCC, 'Refinement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories: Volume 2: Energy' (2019). https://www.ipcc-nggip.iges.or.jp/public/2019rf/vol2.html (last accessed 2 March 2022)

[116] Romppanen 2020, 'The Bioenergy 'Blind Spots' in EU Climate and Energy Law' p.158

[117] SEC(2010) 65 final, p.23

[118] Norton et al. 2019, p.1257; Romppanen 2020, 'The Bioenergy 'Blind Spots' in EU Climate and Energy Law' p.158

This assumption has been extensively disputed by scientists, who repeatedly informed the European Commission[119] and the Parliament[120] of the scientific inaccuracy of this assumption, in vain. Indeed, assuming that the combustion of bioenergy is carbon neutral means ignoring the time needed for trees to reach maturity to start absorbing CO2 again (also known as 'payback time'); a process that can take decades or even centuries.[121] This means that carbon neutrality can be achieved in the long-term only once young trees start absorbing CO2 but not in the short to medium term, depending on the forests age and characteristics.

Assuming that forest-based biomass is carbon neutral also ignores that, for decades, the emissions from bioenergy can exceed those from fossil fuels.[122] The European Commission staff themselves highlighted this issue stating that 'the use of certain forest biomass feedstocks for energy purposes can lead to substantially reduced or even negative greenhouse gas savings compared to the use of fossil fuels in a given time period (ex: 20 to 50 years or even up to centuries)'.[123]

This is very problematic as it is well known that CO2 emission reductions must occur urgently in order to limit the adverse effects of climate change.[124] Increasing CO2 emissions for decades will have immediate and permanent damages.[125]

More generally, one can argue that replacing carbon intensive energy sources with another source that is not carbon neutral is pointless given the urgency we are in. It is important to note that the consequence of this mismatch between policy and science can achieve 'the reverse of that intended: initially exacerbating rather than mitigating climate change'.[126]

[119] EASAC 2018, p.2; Raven 2021, p.2; Joint Research Centre 2021, p.91

[120] Beddington et al. 2018, p.1

[121] Grassi et al. 2018 p.3

[122] Norton et al. 2019 p.1259; EASAC 2021 p.1:'burning wood produces significantly more CO2 per unit of energy delivered than burning coal and double that of gas, so the initial impact on climate is negative.'

[123] SWD(2016) 418 final, p.15

[124] IPCC 2022, p.4

[125] Raven 2021, p.2

[126] Norton et al. 2019, p.1258

This lack of policy/science alignment was raised in the so-called *Biomass case*[127] where applicants argued that the RED II and the LULUCF Regulation failed to consider the available scientific and technical data when developing environmental policies, as required by the Treaty of the Functioning of the European Union (TFEU).[128] The applicants alleged that this resulted in the RED II and the LULUCF Regulation not taking into account the scientific data which demonstrate that the production of forest-based bioenergy can increase the quantity of carbon in the atmosphere.[129] While this argument remains untested before the CJEU because the Court did not adjudicate the case on the merits, the case shined a spotlight on the shortcomings of the LULUCF Regulation.

In practice, considering forest-based bioenergy as climate neutral results in incentivizing Member States to increase their production and use which in turn increase the demand. While the EU forests still constitute a carbon sink, it contributes in creating a carbon debt for the next decades or centuries.[130]

In sum, additionally to being scientifically wrong, the assumption described above has translated into a shift of responsibility from the RED II to the LULUCF Regulation to account for the forest-based bioenergy's climate impact. Hence, there is a significant reliance on the LULUCF Regulation's accounting of emissions, on which depends the credibility of the whole system.

3.1.2. The accounting rules and the climate impacts of forest-based bioenergy

To policy choice of relying fully on the LULUCF Regulation to account for the climate impact of forest-based bioenergy is problematic for several reasons.

First, as touched upon in the previous chapter, the accounting rules under the LULUCF Regulation do not include forest biomass harvested outside of the EU (see 1.2). In practice that means that emissions stemming from the harvest of non-domestic forest biomass in the EU remain unaccounted for. The LULUCF Regulation

[127] Case T-141/19, *Sabo and Others v Parliament and Council* at 184

[128] TFEU, Article 191(3)

[129] Case T-141/19, *Sabo and Others v Parliament and Council* at 185

[130] Raven 2021, p.2

is therefore not pertinent for monitoring changes in carbon stocks of non-EU forests supplying the EU.[131]

This accounting gap is problematic because 4% of the forest biomass used in the EU is harvested outside the EU[132] and, following the current trend, is expected to increase. The Parliament and the Council themselves recognized this fact in the RED II, stating that 'harvesting for energy purposes has increased and is expected to continue to grow, resulting in higher imports of raw materials from third countries […]'.[133] This deficiency has been raised in the *People's Climate Case.*[134] As explained in the introduction, this is one of the cases that have so far been considered by the CJEU on matters related to climate change. The case concerns multiple legal grounds but for the present purposes, what matters is that the applicant urged the CJEU to, inter alia, declare the LULUCF Regulation as void. The CJEU did not rule on the merits and dismissed the case on procedural grounds.

Second, the FRL, which is the main accounting instrument under the LULUCF, has shown some flaws. The European Commission recently admitted that the process of establishing FRLs had proven to be burdensome and resulted in many gaps in the accuracy of LULUCF emissions and removals estimates.[135] Several reasons can explain this statement.

An important flaw lies in the significant discretion of Member States when determining their FRL. Indeed, as noted in the previous chapter (see 2.2.3), the criteria to be followed to set the FRL such as 'sustainability', 'forest management practices' or how to preserve sinks, are loose and lack detailed explanations of their meaning and what they need to encompass. These criteria have been described as resembling to guiding principles rather than criteria per se.[136] The European Commission guidance document admittedly provides some advice but its non-legally binding nature weakens its value. Hence, Member States benefit from considerable

[131] Forestry Commission 2021 p.6

[132] Joint Research Centre (JRC) 2019, p.2

[133] RED II, Recital 103

[134] Case T-330/18 *Carvalho and Others v Parliament and Council* at 356(c)

[135] COM(2021) 554 final, p.7

[136] Romppanen 2020, 'The LULUCF Regulation: the new role of land and forests in the EU climate and policy framework' p.274

discretion when setting their FRLs. As the exclusive tool for accounting the climate impact of the production of forest-based bioenergy, the FRL should guarantee a reliable results, as the credibility of the whole accounting system and in turns of the relevance of using forest-based bioenergy as a mean to achieve climate neutrality relies on it.[137]

Given the ample room of manoeuvre of Member States when determining their FRLs, this credibility ultimately depends upon how transparently and honestly Member States decide to use their discretion.[138]

When reviewed by the European Commission, almost all FRLs for the compliance period 2021-2025 required revision and some such as the ones for Bulgaria, the Czech Republic, Germany, Cyprus and Poland had to be entirely recalculated.[139]

The choice of the reference period 2000-2009 also causes problems. It appears that policy incentives to expand the use of forest-based bioenergy were already established during this baseline period and forest management practices were moving towards increased harvests for bioenergy supply already.[140] Consequently, FRLs were including policy considerations, something that the system was planned to avoid. This resulted in an increase of harvesting during the compliance period, which was allowed without being accounted for.[141]

Another intrinsic weakness of the accounting system under the LULUCF Regulation lays in the fact that, if during the compliance period the carbon sink of a Member State is larger than the FRL, burning forest biomass to produce bioenergy will not be accounted for. Indeed, as accounting is done at harvest, if a Member State's overall sink is above the FRL, emissions will not be accounted for because the harvest has not resulted in a decrease of the forest sink, even though the use of biomass has emitted CO2. Therefore, the CO2 emissions resulting from the combustion of forest biomass are only really accounted for when the harvesting is so intense that the Member State's carbon sink ends up going below the FRL. However, from the

[137] Nabuurs et al. 2018 p.3

[138] Romppanen 2020, 'The Bioenergy 'Blind Spots' in EU Climate and Energy Law' p.161

[139] SWD(2020) 236 final, p.27; SWD(2019) 213 final

[140] Forestry Commission 2021 p.7

[141] *Ibid.*

atmosphere perspective, if trees are harvested and burned for energy, this adds carbon to the atmosphere. Therefore, asserting that the LULUCF Regulation accounts for the CO2 emissions resulting from forest-based bioenergy is partly erroneous, as it only does when the Member State's sink is below the FRL. This argument was made in the so-called B*iomass case*[142] as part of the line of arguments calling into question the treatment of forest-based bioenergy as a climate neutral form of renewable energy. While the European Court of Justice did not adjudicate the case on the merits because of lack of standing of the plaintiffs[143], this case highlights the shortcomings of the LULUCF Regulation.

The accounting system based on FRL can also generate 'hot air' (i.e. credits that do not represent real emissions reductions). Indeed, if it results from the FRL that a Member State is allowed to conduct greater forests harvesting but it decides not to do so, the Member State will still be able to claim net removals, even if no climate change mitigation actions has occurred.[144]

It can be implied from all of the above that the LULUCF Regulation is not robust enough in its accounting methods and leaves too much discretion to Member States when determining their FRLs. Thus, the current legislative approach does not wholly consider the climate impacts of forest-based bioenergy. [145]

Flexibilities: The flexibility rules within the emissions accounting framework are not exempt from flaws either. Indeed, as mentioned previously, Member States can legally increase logging in managed forests and compensate the resulting debit in other land-categories if emissions in the LULUCF sector are lower than the total EU removals and if they have taken measures to conserve or enhance forest sinks as appropriate.[146] It is noteworthy that the Regulation says 'as appropriate' which, once again, leaves a lot of discretion to Member States to decide whether they are planning

[142] Case T-141/19, *Sabo and Others v Parliament and Council* at 34 and 35

[143] Order of the Court (Eighth Chamber) 14 July 2021 in case C-297/20 P

[144] Forestry Commission 2021 p.7

[145] Romppanen 2020, 'The Bioenergy 'Blind Spots' in EU Climate and Energy Law' p.161

[146] LULUCF Regulation, Articles 13(2) a-b

to preserve or increase sinks. As a matter of fact, either of these choices can make a big difference.

This provision means that the emissions stemming from increases in forests harvests for bioenergy production are not included in the Member State's account balance as they are compensated somewhere else (see 2.2.4).[147] In practice, it also means that Member States can increase the harvest of biomass above their annual forest growth while keeping the same carbon stock at country level.[148] Nabuurs et al. demonstrated that 'the EU may increase forest harvest from 420 million m^3 in 2000-2009 to 560 million m^3 in 2050, without creating any debits'.[149]

Flexibilities between the LULUCF Regulation and the Effort Sharing sectors (transport, agriculture, waste, building) are also questionable. Indeed, a Member State is allowed to increase forests harvesting (i.e. have a debit in the LULUCF sector) because it can compensate this debit by reducing emissions in other sectors covered by effort sharing.[150] This is problematic as forests act as sinks which are crucial for climate change mitigation.

Finally, flexibilities between the compliance periods (2021-2015 and 2026-2030)[151], also known as 'banking' call into question the 'no-debit rule' (i.e. no net emissions should occur in any particular year). Indeed, this rule allows Member States to emit CO2 without having to compensate, as these emissions have already been compensated by past activities. This also means that emissions savings which are essential to tackle climate change can be sacrificed later in time.[152]

Thus, the legal rules on flexibilities can be seen as weakening the LULUCF Regulation's climate integrity.[153]

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[147] Savaresi and Perugini 2021, 'Balancing Emissions and Removals in the Land Sector: The View from the EU' p.54

[148] *Ibid.*

[149] Nabuurs et al. 2018 p.6

[150] Fern 'Fern analysis of the EU's LULUCF Regulation' (April 2018) https://www.fern.org/fileadmin/uploads/fern/Documents/Analysis%20of%20trilogue%20outcome%20on%20LULUCF%20Regulation_final_0.pdf (last accessed 1 February 2022) p.5

[151] LULUCF Regulation, article 12(3)

[152] Case T-330/18 *Carvalho and Others v Parliament and Council* at 356

[153] Öko-institut 2019, p.21

3.1.3. The 'no-debit rule'

As mentioned above, the LULUCF sector is key to achieve carbon neutrality. However, its main commitment, the 'no-debit rule', prescribing for a balance between emissions and removals is weak and limited. Indeed, it neither prohibits Member States to decrease their sinks nor it forces them to increase them.[154] The 'no-debit rule' does not set legally binding targets for Member States either. This is an issue as the current climate state, stressed by the IPCC reports, calls for ambitious actions to increase and preserve sinks to tackle climate change and because we increasingly rely on the LULUCF sector to achieve climate neutrality. Modelling scenarios constraining global temperature rise to no more than 1.5°C show that a large increase in carbon uptake and significant reductions of emissions are necessary.[155] As explained previously (see 2.2.1), the 'no-debit rule' is the best political compromise that could be achieved by the EU given the complexity to regulate this sector notably because of the uncertainty associated with it (i.e. the impacts of natural disturbances such as fires) and the Member States' diverging political views. Having said that, the current increase of logging in certain Member States, such as Finland and Sweden, and the increase of demand for renewable energy, and, in turn, for bioenergy makes the 'no-debit rule' highly unambitious today and not fit for purpose.

The 'no-debit' legal obligation weakens the role of the LULUCF sector in achieving the 2030 Climate and Energy targets. While it could have been deemed sufficient to achieve the rather low 20-20-20 climate target, it is clearly not adequate anymore.[156] The so-called *Biomass case* argues that the mitigation capacity of LULUCF sector must be better taken into consideration by the EU and this has been proven possible in the past. Indeed, the recitals of the initial legislation on LULUCF emissions[157] gave a more stringent direction to the provisions of the Decision. It recognized the role of the LULUCF sector to contribute to climate change mitigation through carbon sequestration.[158] It did so by stating 'the LULUCF sector can contribute to climate

[154] Romppanen 2020, 'The LULUCF Regulation: the new role of land and forests in the EU climate and policy framework' p.272

[155] Case T-141/19, *Sabo and Others v Parliament and Council* at 32

[156] Savaresi et al. 2020 p.219

[157] Decision 529/2013/EU, Recital 7

[158] Case T-330/18 *Carvalho and Others v Parliament and Council* at 106

change mitigation […] by *reducing emissions*, and maintaining and enhancing sinks and carbon stocks.'[159]

Currently, Member States are allowed to increase emissions when producing forest-based bioenergy as long as they are compensated. This shows that the EU legislation regulating the LULUCF sector is ambivalent. In the current climate context, it is fair to say that a shift to more stringent requirements is necessary. Indeed, this shift from 'reducing emissions' to 'balancing emissions' remove incentives for the EU to increase its sink.

The *People's Climate case* also voiced that evidence indicated that the LULUCF Regulation could have required net removals, instead of the 'no-debit rule'. During the discussions on a proposal for a Regulation on the inclusion of GHG emissions and removals from LULUCF sector into the 2030 climate and energy framework, the Parliament proposed amendments to include emission reduction requirement instead of the 'no-debit rule'. It stated that achieving the climate goals of the Paris Agreement 'requires the world to enter into a period of *negative levels of emissions*, during which forests […] will play a central role.'[160]

While the 'no-debit rule' is not aligned with the urgent and ambitious climate actions needed today, it is important to keep in mind that the LULUCF Regulation negotiations were arduous so the 'no-debit rule' has been deemed to be the best that could be achieved considering Member States' conflicting views.[161]

3.2. The Renewable Energy Directive II

3.2.1. The weaknesses of the sustainability criteria

The RED II sustainability criteria of article 29(6) are supposed to act as safeguards against the potential adverse effects of the production of forest-based bioenergy. However, these safeguards have some flaws.

[159] Decision 529/2013/EU, Recital 7

[160] European Parliament A8-0262/2017, p.9

[161] Romppanen 2020, 'The LULUCF Regulation: the new role of land and forests in the EU climate and policy framework' p.275

Scope of application: First of all, the scope of application of the sustainability criteria is limited. As explained in chapter 2 (see 2.1.3), the criteria only apply to installations equal to or exceeding 20 MW for solid biomass. In practice the majority of EU installations fall between the cracks of this provision which makes the latter highly inefficient.[162] This also leads to perverse consequences within the EU bioenergy market where forest biomass meeting the sustainability criteria is sold to bigger installations while non-complying forest biomass is sold to smaller installations.[163]

It is noteworthy that article 29(1)(c) of the RED II gives the possibility to Member States to apply the sustainability criteria to installations with lower total rated thermal input than 20 MW. Article 29(14) RED II also allows Member States to establish additional sustainability criteria for biomass fuels. However, these provisions are undermined by article 29(12) which says that Member States must not refuse to take into account bioliquids obtained in compliance with the sustainability criteria when measuring compliance with renewable energy obligations, contribution towards the Union target and the eligibility for financial support.[164] Therefore, it can be interpreted as meaning that Member States can set more stringent criteria, however not mandatory, as long as the bioliquids respect the sustainability criteria established in the Directive.

Furthermore, the sustainability criteria only apply to electricity and heating. This means that the wood used to produce electricity for residential heating does not have to comply with the sustainability criteria. This is problematic because most of the wood used for energy in the EU is for residential heating.[165]

The rationale behind this narrow scope is the minimization of administrative burden as highlighted by Recital 104. While the administrative burden is surely one of the issues of the RED II[166], from an environmental perspective one can wonder if it is a

[162] Romppanen 2020, 'The Bioenergy 'Blind Spots' in EU Climate and Energy Law' p.158

[163] Öko-Institut, 'Erosion of European Sustainability Requirements for Bioenergy' (21 August 2018), https://blog.oeko.de/erosion-of-european-sustainability-requirements-for-bioenergy (last accessed 12 March 2022)

[164] RED II, Article 29(1)(a-c)

[165] Booth and Mitchell 2020 p.36

[166] COM(2021) 557 final. p.50

sufficient reason to weaken the scope of the criteria to this extent. Additionally, scrutiny is necessary for the system in place to function.

It results from all of the above that, in practice, the narrow scope of the sustainability criteria means that the majority (around 75%)[167] of the EU forest-based bioenergy does not need to comply with the sustainability criteria.[168] This tremendously weakens the criteria and undermines the aim of the legislation to produce forest-based bioenergy as a means to contribute to climate change mitigation action.

Legality of harvesting operations: The first sustainability criterion requires the country of harvesting to ensure the legality of the harvesting operations.[169] This is of course essential but the RED II only focuses on the legal regime in place in the harvesting country rather than on the outcomes produced by the implementation of these legal regimes. This means that as long as the harvest is legal in a given country, it fulfils the first sustainability criterion. The 'technical assistance for the preparation of guidance for the implementation of the RED II sustainability criteria' report (REDIIBIO)[170] provides that 'if a country has legislation and proper enforcement and monitoring in place at a national level there is a low risk of forest biomass derived from unsustainable production'. This loose statement assumes that legally harvested wood equals sustainably harvested wood and that the mere existence of regulatory or management systems ensures sustainability.[171] Additionally, the great majority of countries providing forest biomass to the EU have laws regulating forestry which further weaken the criterion by making them immediately compliant.[172]
Many examples have proven the erroneousness of this statement which seem to ignore the variety of laws and regulations in different countries. Highly damaging actions are allowed and legal in a lot of countries. This is the case in Canada for

[167] Hennenberg et al. 2018, p.1519

[168] Öko-Institut, 'Erosion of European Sustainability Requirements for Bioenergy' (21 August 2018), https://blog.oeko.de/erosion-of-european-sustainability-requirements-for-bioenergy (last accessed 12 March 2022)

[169] RED II, Article 29(6)(a)(i)

[170] European Commission 2021

[171] Fern et al. 2021, p.8

[172] Fern et al. 2021, p.4

example where it has been reported that some wood pellets imported by the EU come from ancient cedars in British Columbia's inland rainforest.[173] Yet, this practice is legal under Canadian law.[174] This is also the case in Estonia where wood is being certified as sustainable even if it includes logging in wetlands and habitat of threatened and endangered species and the 'removal of stumps after logging which tears up organic soils and leads to soil carbon loss'.[175] While this practice is legal under Estonian forestry laws, and therefore fulfils the 'legality criterion', it is far from being sustainable. The RED II criteria therefore do not prevent against these harmful practices. Clearly, the EU cannot conduct qualitative assessment of all harvesting country's forestry laws, which means that this criterion is inadequate to minimize the risk of using unsustainable forest biomass.

Some voluntary legality verification initiatives between the EU and non-EU countries - such as those undertaken under EU FLEGT Action Plan, to combat illegal timber logging and strengthen forest governance for timber imported into the EU[176] - can be relevant to address the weakness of the 'legality of harvesting operations' criterion. However, as mentioned, these initiatives hinge on voluntary arguments with exporting countries and do not cover all exporters of forest biomass.

Maintenance or improvement of the forest's long-term production capacity: The RED II further requests harvesting countries to ensure the maintenance or improvement of the forest's long-term production capacity.[177] The REDIIBIO guidance document defines 'forest's long-term production capacity' as 'the ability of forest land to sustainably deliver products (such as wood of various quality grades) and services (such as forest recreation, air and water purification) over a long period of time, bridging several successive forestry rotations.'[178] This provision and its efficiency in protecting forests as carbon sinks are quite unclear. At all events, it seems like this provision does not restrict the volume of harvest. Indeed, forests can be harvested

[173] Booth and Mitchell 2020 p.43

[174] *Ibid.*

[175] *Ibid.* p.42

[176] COM(2003) 0251 final. p.2

[177] RED II, Article 29(6)(a)(v)

[178] European Commission 2021, p.13

without affecting forests' long-term production capacity.[179] Hence, this provision presumably has little impact on the preservation of forests in the energy production process.

Additionally to the flaws highlighted above, the RED II also lacks some provisions that have been presented by some as the main solution to avoid the adverse effects of the production of forest-based bioenergy on forests.[180] This is the case of the cascading approach which is not encompassed in the Directive for forest-based bioenergy. According to the cascading approach, only waste and previous used wood residues are used for the production of bioenergy. These residues include inter alia, branches and barks from forestry or from natural phenomenon such as fire or diseases. Because these residues have a short pay back period and would otherwise decompose and release CO2 in the atmosphere or be burnt for disposal, their use is considered sustainable. The RED II defines biomass as 'the biodegradable fraction of products, *waste and residues* […] from forestry and related industries […].[181] This has been interpreted as implying that only waste and residues should be used for the production of bioenergy.[182] Yet, the sustainability criteria do not include any reference to the use of waste and residues.

It is noteworthy that several authors have expressed reservations regarding the use of waste and residues for the production of bioenergy. Booth and Mitchel highlighted the fact that the CO2 emissions stemming from burning waste and residues are greater than the emissions from decomposition over time.[183] Modelling shows that after 10 years of operation, 60% to 90% of the cumulative CO2 emissions[184] from the combustion of residues in Europe add a net amount of CO2 in the atmosphere.[185]

[179] Searchinger et al. 2018, p.7

[180] Romppanen 2020, 'The Bioenergy 'Blind Spots' in EU Climate and Energy Law' p.153; Joint Research Centre 2021, p.92; Norton et al. 2019, p.1259

[181] RED II, Article 2(24)

[182] Booth 2018, p.8

[183] Booth and Mitchell 2020, p.26

[184] Difference between the emissions stemming from the combustion and the emissions stemming from natural decomposition over time

[185] Booth 2018 p.5

However, one can wonder whether using waste and residues is not a necessary trade-off between banning bioenergy and conducting logging for the sole purpose of the production of forest-based bioenergy.

Moreover, it is noteworthy that there is an important disparity in the treatment of agriculture land and forestry. First, the RED II acknowledges the carbon impacts of land conversion for the cultivation of biomass.[186] It highlights the risk of release of CO2 emissions from the soils. The Directive further recognizes the risks associated with land change in terms of CO2 emissions reduction and the fact that the positive GHG impacts expected from bioenergy can be jeopardized by these land changes.[187] This stringent stand is translated in article 29(2)-(5) which set up safeguards against the risk of carbon emissions deriving from agricultural biomass production. For example, waste and residues can be used only if their carbon impacts are addressed[188] and agricultural biomass is inadmissible, if sourced from land having a high carbon stock.[189] Therefore, the failure to adopt stricter sustainability criteria regarding forest-based bioenergy is hard to justify from an environmental perspective, as forest harvesting can be as damaging as converting forest to another land type.[190]

The risk of having such weak sustainability criteria is that the EU forests might switch from a sink to a source of GHG emissions by 2030. [191]

3.2.2. The flaws of the LULUCF criteria

As mentioned earlier (see 2.1.4), to fulfil the LULUCF criteria, the country of origin of the biomass must be party to the Paris Agreement. This is supposed to ensure a certain level of sustainability of the forest biomass. However, not all NDCs have equal objectives and level of monitoring in the LULUCF sector [192] and the EU cannot

[186] RED II, Recital 114

[187] RED II, Recital 114

[188] RED II, Article 29(2)

[189] RED II, Article 29(3)

[190] Case T-141/19, *Sabo and Others v Parliament and Council* at 94

[191] Savaresi et al. 2020 p.219

[192] Joint Research Centre 2021, p.93

assess the party's NDC to ensure the relevance of the measure proposed in the LULUCF sector nor it can ensure the party's compliance with its Paris Agreement's obligations. In this context, it can be argued that if the objective of the EU is to minimize the risk of negative impacts on forests carbon stocks and the use of unsustainable forest-based biomass, these criteria do not provide for a strong enough safeguard.

This goal is further undermined by the fact that an overwhelming majority of countries (193) have ratified the Paris Agreement and are therefore de facto fulfilling the first criterion.

The cumulative criteria under article 29(7)(a)(ii) requiring that NDCs include a carbon accounting system for biomass harvesting are also highly inefficient. Indeed, most parties' commitments are relatively poor and therefore do not safeguard against adverse impacts of forest biomass. An analysis of 167 NDC in 2018 noted that '46 contained no separate LULUCF targets, but integrated them into broader economy-wide targets, and only 27 contained separate LULUCF targets. Only 13 of those NDCs anticipated the use of any kind of accounting rules for their integrated targets and only 18 set out measures and policies for LULUCF mitigation.'[193]

This shows that the mere requirement of having an accounting system in place neither guarantee a sustainable treatment of forest biomass nor preservation and enhancement of carbon sinks. In fact, only when a country is not party to the Paris Agreement or does not have a carbon accounting system in place under its NDC, does it have to demonstrate that is it maintaining its forest carbon stocks. As explained in the previous chapter (see 2.1.4), the LULUCF Regulation only requires those countries to provide evidence that the emissions from the LULUCF sector do not exceed removals.

For all these reasons, the LULUCF criteria have been described as 'a toothless tiger'.[194]

[193] Brack et al. 2021, p.20

[194] Öko-Institut, 'Erosion of European Sustainability Requirements for Bioenergy' (21 August 2018), https://blog.oeko.de/erosion-of-european-sustainability-requirements-for-bioenergy (last accessed 12 March 2022)

3.2.3. The limited impacts of the GHG emission savings criteria

The GHG emission savings criteria, guaranteeing that the use of biomass is saving GHG emissions compared to the use of fossil fuels is vain because its scope of application is extremely narrow.

First of all, these criteria do not apply to existing facilities, regardless of their size. This means that existing installations, automatically fulfil article 29(1)(10) and are considered ensuring 'high greenhouse gas emissions savings compared to fossil fuel alternatives and to avoid unintended sustainability impacts'[195] without having to meet the GHG emission savings criteria.

Furthermore, installations below 20 MW[196] do not need to meet these criteria either. As a result, only future installations equal or exceeding 20 MW have to comply with the GHG emission savings criteria. A study has shown that, following current patterns, the size of installations to be built will be smaller than 20MW.[197] Therefore, the GHG emission savings criteria can be considered inefficient.

To illustrate the shortcomings embedded in the existing rules in practice, a study has applied the criteria of the RED II to a concrete case in the Finish Lapland.[198]

[195] RED II, Recital 101

[196] RED II, Recital 104

[197] Booth and Mitchell 2020, p.36

[198] Fern et al. 2021, p.10

Case study 5: Lapland forests on Indigenous territory burnt in district heating plants

Summary

300-year-old round wood is being burnt in district heating plants in Inari. It is also harming the reindeer herding of the Sámi – the only Indigenous Peoples of the EU.

Read more

Credit: Greenpeace

Is the project smaller than 20MW? Would the sustainability criteria apply?

No. The wood is being burned in three heating plants owned by the company Inergia. The biggest has a nominal capacity of 4.5MW so it would not need to comply with REDII criteria.

Is the harvesting happening in a country with Sustainable Forest Management (SFM) laws?

Finland has all the relevant SFM laws as required by the operational guidelines.

Does the country have an infringement case against it?

Finland does not have any infringement cases against it.

If there are no SFM laws, and no infringement cases against them, can they demonstrate that harvesting is happening legally?

Not applicable as Finland has relevant SFM laws.

Does the wood come from a country with a Nationally Determined Contributions (NDC – a country's plan for how it meets the Paris Climate Agreement goals) that includes LULUCF and were forests a sink in the last decade?

Finland is part of the EU's NDC that includes LULUCF.

If the NDC is not linked to LULUCF, or the country's forests are a source of emissions, can they demonstrate compliance with LULUCF at forest sourcing level?

Would not apply because Finland has relevant LULUCFaccounting.

Verdict:

The REDII criteria would not have prevented logging from increasing as a result of forest biomass being considered a renewable form of energy.

3.3. Intermediate conclusion

It results from all of the above that the LULUCF Regulation and the RED II present great flaws that undermine the achievement of carbon neutrality and the protection of forests. These flaws need to be addressed in order for bioenergy to sustainably contribute to the achievements of EU and Paris Agreement the climate targets. This is the aim of the amendments proposed by the European Commission in July 2021 in the framework of the Green Deal.

4. The 'fit for 55' reforms: remedy for the shortcomings?

This chapter aims at presenting both the Commission's proposals and the Parliament draft amendments on the RED II and the LULUCF Regulation to reflect on their relevance to address the shortcomings discussed in the previous chapter, and ultimately their ability to protect and enhance carbon sinks and minimize the detrimental impacts of bioenergy on forests. As mentioned in the introduction (see 1.4.), the aim of this chapter is not to provide an exhaustive analysis of the proposals but rather to focus on the amendments relevant to address the shortcomings presented in the previous chapter.

4.1. The RED II reform proposal

The RED II was designed to meet the 32% renewable energy target and the 40% GHG emissions reduction target by 2030. The new ambition of the EU to achieve net carbon emissions by 2050 entails, inter alia, a substantial increase in renewable energy generation and consumption. Hence, the Commission proposed an increase of the share of renewable energy from at least 32% to minimum 40% by 2030.[199] This increase will result in the growth of biomass demand for bioenergy which needs to be produced sustainability to avoid further pressure on forests and negative climate impacts. This is the aim of the Commission proposal which acknowledged that the current sustainability and climate safeguards needed to be reinforced in light of the increased climate ambition of the EU Green Deal.[200]

4.1.1. Sustainability and GHG emission savings criteria: between the Commission's proposed amendments and the Parliament's setbacks

A 2021 Joint Research Centre (JRC) study on the use of woody biomass for energy production in the EU[201] suggests that additional precautions have to be taken to address the shortcomings presented in the previous chapter, given the increase

[199] COM(2021) 557 final, Article 3

[200] COM(2021) 557 final, p.11

[201] Joint Research Centre 2021, p.35

demand for forest biomass.[202] Some of the JRC's recommendations are included in the Commission proposal.

One of the most important proposed amendments to the RED II lies in scope of application of the sustainability and GHG emission savings criteria.
First, on the size of installations, the Commission proposes to lower the threshold for biomass-based heat and power installations to include small-scale ones which have a total thermal capacity of 5 MW.[203] This greatly lowers the 20 MW threshold currently in place. Additionally, the proposal suggests allowing Member States to apply the sustainability and GHG emission savings criteria to installations with thermal capacity lower than 5 MW.[204]
This has been flagged by the JRC as one key necessary change to avoid 'environmental leakage risks' by smaller installations.[205]
While this proposition has been broadly welcomed,[206] given it seeks to address one of the main shortcomings of the rules governing forest-based bioenergy, it can be argued that this provision might have limited impacts, if the sustainability and GHG emission savings criteria themselves are not strengthened.[207]

The Parliament draft report rejects to set the minimum threshold at 5MW and proposes to maintain it at the current 20MW.[208] The Parliament justifies this backtrack by the administrative burden it would impose on small bioenergy installations. Again, from an environmental perspective, it is fair to wonder whether this is a sufficient reason to exempt most of the EU's bioenergy plants from the meeting the sustainability criteria.

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[202] COM(2021) 557 final, p.17

[203] COM(2021) 557 final , Article 29(1)

[204] COM(2021) 557 final , Article 29(1)

[205] COM(2021) 557 final, p.17

[206] Fern 2021, p.2; WWF et al. 2021 p.2

[207] *Ibid.*

[208] European Parliament, 2021/0218(COD), Amendment 67; ENDS Europe, 'Tracker: Where does Parliament stand on the Fit for 55 files?' (25 February 2022). https://www.endseurope.com/article/1737528/tracker-does-parliament-stand-fit-55-files (last accessed 25 March 2022)

Second, the proposal suggests broadening the type of installations covered by the GHG emission savings criteria. The latter should apply to both existing and new installations. Article 29(10)(d) replaces '[…] biomass fuels used in installations *starting operation* from 1 January 2021' by '[…] biomass fuels used in installations *until 31 December 2025'*. If adopted, this would fill in a gap in the current GHG emission savings criteria, which only apply to new installations. The more carbon intensive production solutions would be excluded and GHG emission savings would then be guaranteed.[209] However, the parliament draft report proposes to keep the current provision, arguing that including existing installations in the scope of the GHG emission savings criteria would create uncertainty for investors.[210] This would however be a missed opportunity to address the gap related to the narrow scope of the current Directive (see 3.2.3).

Finally, the Commission proposes to adopt a delegated act applying the cascading approach for biomass. The delegated act would focus on the ways to apply the cascading principle for biomass and notably on how to minimise the use of quality roundwood for energy production.[211] This suggestion is in line with the predominant opinion according to which the environmental risks associated with the production of forest-based bioenergy can be reduced if a cascading approach is applied (see 3.2.1). The Commission further proposes to require Member States to apply the cascading approach when setting up renewable energy support schemes.[212]

4.1.2. The limited impact of the amended support schemes

The EU Commission proposal suggests amending article 3 of RED II prohibiting the establishment of support schemes for forest-based bioenergy produced by certain installations or with certain type of biomass.

First, it proposes that forest-based bioenergy produced from electricity-only installations will not be eligible for financial support from 2026 onwards, unless it is

[209] COM(2021) 557 final, p.149

[210] European Parliament, 2021/0218(COD), Amendment 70, p.58

[211] COM(2021) 557 final, Article 3(b)

[212] COM(2021) 557 final, p.30

produced in regions identified in a just transition plan.[213] These regions are the ones identified as needing financial support for the transition from the production of carbon intensive energy sources to the production of renewable energy.[214] This proposal will have a limited effect because most EU installations produce both electricity and heat.[215] Additionally, in the regions identified in just transition plans (e.g. coal mining regions),[216] there is a high conversion rate from coal power plants to biomass production. The NGO Fern therefore argues that maintaining subsidies in these regions is problematic, as investments should target other sources of renewable energy[217] which emit less or no CO2.

Second, to limit the climate impacts of forest-based bioenergy and use bioenergy in a way that does not hinder climate mitigation efforts, the EU Commissions has proposed that Member States remove support schemes for the use of saw logs, veneer logs, stumps and roots to produce bioenergy.[218] Indeed, the use of these feedstocks can have a high climate impact for several decades after harvesting.[219]
While this change in the legislation can be deemed relevant in theory, in practice these feedstocks are rarely used for the production of bioenergy.[220]
The Parliament draft report rejected the EU Commission's proposals, claiming that sustainable forest management should remain a national competence.[221]

[213] COM(2021) 557 final, Article 3(b)(i)

[214] European Commission 'The Just Transition Mechanism: making sure no one is left behind', https://ec.europa.eu/info/strategy/priorities-2019-2024/european-green-deal/finance-and-green-deal/just-transition-mechanism_en (last accessed 18 March 2022)

[215] Fern 2021, p.2

[216] European Commission 'The Just Transition Mechanism: making sure no one is left behind', https://ec.europa.eu/info/strategy/priorities-2019-2024/european-green-deal/finance-and-green-deal/just-transition-mechanism_en (last accessed 18 March 2022)

[217] Fern 2021, p.2

[218] COM(2021) 557 final, Article 3(a)(i)

[219] Carina Ortiz et al. 2016, p.1

[220] Fern 2021, p.1

[221] ENDS Europe 'Analysis: Tough negotiations ahead as EU grapples with role of biomass in the energy transition' (17 February 2022) https://www.endseurope.com/article/1740979/analysis-tough-negotiations-ahead-eu-grapples-role-biomass-energy-transition (last accessed 30 March 2022)

4.1.3. 'No go areas'

To strengthen the sustainability criteria, the Commission proposal suggests introducing a provision prohibiting forest biomass to be sourced in carbon-rich habitats such as primary forests, so called 'no-go areas'.[222] Primary forests are 'forest that have never been logged and have developed following natural disturbances and under natural processes, regardless of its age'[223]. The proposal extends the prohibition already in place for agricultural biomass to forest biomass, bridging the gap between the two sectors. The stated aim of this amendment is to ensure that the sourcing of forest biomass reduces the risk of substantial carbon impact and protects forest sinks. This is in line with the findings of the JRC report above-mentioned that highlights the tremendously negative impacts of using primary forests for climate mitigation.

However, several NGOs have lamented that this new provision would have little impact, as only 3% of EU forests are primary forests and a very small amount of biomass is sourced from primary forests.[224]
While this provision might indeed have little impact on EU primary forests, it might have a more important impact on primary forests outside of the EU which host most of primary forests. The exclusion of these areas will decrease the availability of forests from which biomass can be sourced, and imports are expected to decrease by 7% by 2030.[225] One could argue that this provision might result in increased pressure on EU forests as demand is only expected to increase. This is problematic as the EU forest sink is decreasing and EU forests are already under substantial pressure.[226] However, it is easier to ensure the sustainability of wood harvested in the EU, than for imported biomass. Additionally, the Commission's proposal seems sound as further

[222] COM(2021) 557 final, Recital 36

[223] Convention on Biological Diversity (CBD), 'Definitions', https://www.cbd.int/forest/definitions.shtml#:~:text=A%20primary%20forest%20is%20a,alter%20them%20for%20human%20use (last accessed 30 March 2022)

[224] WWF et al. 2021 p.2; Fern 2021, p.2; ENDS Europe 'Leak: Forest conservationists slam RED reform plans' (17 June 2021) https://www.endseurope.com/article/1719654/leak-forest-conservationists-slam-red-reform-plans (last accessed 17 March 2022)

[225] COM(2021) 557 final, p.148

[226] Joint Research Centre 2021, p.95

protection of primary forests should be welcomed. Ultimately if the pressure on EU forests becomes too great, the answer might be the decrease use of forest-biomass for bioenergy.

The Commission proposal also suggests amending article 29(6)(iv), by requiring source countries to avoid the degradation of primary forests or their conversion into plantation forests.[227] When read together with the 'no-go areas' prohibition, the proposal formally excludes the sourcing of forest biomass in primary forests but requires States to *avoid* the degradation of primary forests. This non-binding language deviates from the strict prohibition.

Ten Member States lead by Sweden and including Finland decried the revision of the RED II sustainability criteria, arguing that as the REDII's implementation period ended on 30 June 2021, the criteria had not been in place long enough to be amended. The coalition of ten Member States further stated that 'national characteristics concerning forest management practices, geographical location and energy production of Member States have not been sufficiently considered' when elaborating the new sustainability criteria.[228]

When the European Commission asked for reasoned opinions on the Proposal to national parliaments[229], the submission of the Swedish Parliament expressed concerns regarding the role of the Commission on bioenergy. It stated that the Commission went beyond its mandate and breached the principle of proportionality. It argued that the RED II proposal was too detailed regarding bioenergy rules and that it was not needed to achieve its objectives.[230]

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[227] COM(2021) 557 final, Article 29

[228] Euractiv, 'Too early' to revise Europe's bioenergy rules, EU countries say', (21 January 2022), https://www.euractiv.com/section/climate-environment/news/too-early-to-revise-europes-bioenergy-rules-eu-countries-say/ (last accessed 15 April 2022); Swedish Forest Industries, 'EU proposal threatens sustainable bioenergy systems', https://www.forestindustries.se/our-views/current-issues/renewable-energy-directive/eu-proposal/ (last accessed 10 April 2022)

[229] European Parliament 2021, p.7

[230] European Parliament 2021, p.7

It is important to recall that Sweden has a strong forestry industry and that bioenergy represents an important part of their production of renewable energy which can explain this stand on the Commission proposal.

In sum, the Commission proposal for the reform of RED II presently under debate introduces some relevant modifications regarding the sustainability of forest biomass but leaves unaddressed some main weaknesses of the Directive. Indeed, the proposals do not address the flaws of any of the LULUCF criteria and remedy only some of the sustainability criteria. This is also the case of the LULUCF Regulation reform proposal.

4.2. The LULUCF reform proposal

Given the central role of forests both as sink and source of biomass for bioenergy, the 'Fit for 55' package naturally addresses the LULUCF sector to ensure the achievement of the EU targets.

As noted above, the LULUCF sector is currently a net carbon sink but it is decreasing. To reverse this trend, the Commission notes the need for immediate and decisive action.[231]

The stated aim of the amendments proposed by the Commission is to increase the contribution of the LULUCF sector to the achievement of the climate neutrality goal,[232] incentivize Member States to increase their carbon sinks and to simplify the existing accounting rules.[233]

This section therefore aims at highlighting the changes addressing the flaws discussed in the previous chapter rather than providing an exhaustive analysis of the LULUCF Regulation reform. It also analyses the Parliament draft report on the Commission's proposal to underline the possible future changes in the Commission's proposal.

[231] COM(2021) 554 final, p.9

[232] COM(2021) 554 final, p.1

[233] European Commission 'Questions and Answers – The Effort Sharing Regulation and Land, Forestry and Agriculture Regulation' (14 July 2021), https://ec.europa.eu/commission/presscorner/detail/en/qanda_21_3543 (last accessed 26 March 2022)

4.2.1. The new targets and the end of the 'no-debit rule'

To pave the way to achieve the 2050 net zero GHG emissions and climate neutrality goals, the 'fit for 55' package introduces an EU-wide target in the LULUCF sector to be achieved between 2026 and 2030.[234] The proposal suggests that the LULUCF sector be tasked to remove 310 million tonnes of CO2 in 2030.[235] This target represents an increase of around 15%, when compared with the current annual forest removals.[236] The proposal further suggests to introduce a new common binding target for the LULUCF and agriculture sectors together to achieve climate neutrality by 2035.[237]

The reform proposes to divide the EU-wide target between Member States, introducing annual binding national targets for minimum net removals for the period 2026 to 2030. These national targets will be based on emissions and removals reported in the greenhouse gas inventories and the areas of managed land.[238] The Commission proposal therefore abandons the 'no-debit rule' from 2026 onwards.[239] This change therefore addresses one of the main shortcomings of the LULUCF Regulation namely, the lack of ambition of the 'no-debit rule' and makes EU law in this area a lot more ambitious and therefore better aligned with the climate emergency.[240]

However, the Parliament draft report on the LULUCF Regulation proposes to increase the GHG removal target even further. It suggests increasing it to at least 490 million tonnes of CO2 equivalent a year by 2030, arguing that the Commission's proposal is not ambitious enough, as it only proposes to increase the carbon sink

[234] European Commission 'Questions and Answers – The Effort Sharing Regulation and Land, Forestry and Agriculture Regulation' (14 July 2021), https://ec.europa.eu/commission/presscorner/detail/en/qanda_21_3543 (last accessed 26 March 2022)

[235] COM(2021) 554 final, Article 4(2)

[236] Öeko-Institut 2021, '2030 Climate Target: Review of LULUCF Regulation', p.2

[237] COM(2021) 554 final, Article 4(4)

[238] COM(2021) 554 final, p.2

[239] COM(2021) 554 final, Article 4(1)

[240] IPCC 2022, p.5

target to where it was at the beginning of the 2010s.[241] This highlights the current situation in which the legislation proposes to increase EU forest sinks while also, indirectly, promoting the use of forest-based bioenergy.

The reform also proposes the improvement of the current emissions and removals accounting rules, in order to assess the fulfilment of these new targets.

4.2.2. The simplified accounting rules

Acknowledging the flaws of the LULUCF Regulation's accounting system, the Commission reform proposes new accounting rules. The FRL approach would therefore only be used during the first compliance period (2021-2025) and then abandoned for the second period (2026-2030).

The method planned to determine the new binding national targets for 2030 would factor the average GHG emissions and removals for 2016, 2017 and 2018, as reported by each Member State. In 2025, prior to the beginning of the second compliance period, the Commission would conduct an in-depth review of the reported GHG emissions and removals data submitted by the Member States from years 2021, 2022 and 2023. Based on this review, the Commission will determine the annual national targets. These targets will form a linear trajectory to reach the national net removal targets for 2030.[242]

Unlike the FRL benchmark, which was 'baked-in' historical levels of emissions,[243] this new method would be based on the most recent reported and verified GHG emissions and removals. This proposal has been broadly welcomed and described as 'enhancing the transparency of action and simplifies implementation and compliance.'[244]

[241] ENDS Europe 'Campaigners welcome draft parliament report on LULUCF Reform' (5 January 2022) https://www.endseurope.com/article/1736736/campaigners-welcome-draft-parliament-report-lulucf-reform (last accessed 18 March 2022)

[242] COM(2021) 554 final, Article 4(2) first paragraph and Article 4(3)

[243] WWF 2021, p.2

[244] Seita Romppanen 2021, p.8

Conversely, the rules on flexibilities are not planned to be drastically changed. The flexibilities for managed forest land would remain unaltered for the period 2021 to 2025. Member States will still be able to compensate their debits across land-categories, sectors and Member States. The Commission justifies maintaining these flexibilities by making reference to the specificities of the LULUCF sector and by the fact that Member States will need to intensify their actions to reach their national binding targets.[245]

The decision not to introduce changes to the flexibilities for the next three years is problematic, as it means that the flaws previously identified (see 3.1.2) will remain unaddressed. Thus, there is a risk that Member States continue to compensate an increase of harvesting for forest-based biomass by increasing GHG emission reductions in other sectors, accentuating pressure on forests sinks.

For the period 2026 to 2030, the proposal introduces a new land use flexibility mechanism to help Member States achieve their national targets.[246] The scope of this new flexibility mechanism is extended from forest land to all land categories, such as wetlands and cropland. Member States could resort to this flexibility mechanism if the EU achieves its overall target, and if the LULUCF sector is a net sink in the Member State at stake.[247] The flexibility mechanism is capped to a maximum of 178 million tonnes of CO2 equivalent[248] so Member States cannot use the LULUCF sector to avoid reducing their emissions in the other sectors. The European Parliament draft report proposes to limit this flexibility by setting the cap at 89 million tonnes of CO2 equivalent.[249]

The reform further proposes to remove the possibility of banking credits (i.e. flexibility between compliance periods) by deleting article 12(3) of the LULUCF Regulation. Member States would therefore not be able to carry surplus credits into the next phase. This addresses one of the flaws highlighted in the previous chapter

[245] COM(2021) 554 final, Recital 11

[246] COM(2021) 554 final, Article 13(b)

[247] Öko-Institut 2022, p.7

[248] COM(2021) 554 final, Article 13(b)(1)

[249] European Parliament, 2021/0201(COD), Article 13(b)(1)

(see 3.1.2) as it removes the possibility for Member States to emit CO2 that have been compensated in the past.

Except from banking, the Commission's proposal does not reform the flexibility arrangements between the LULUCF sector and the effort sharing sectors for the period 2021-2025. Conversely, the Parliament draft report proposes to amend article 12 of the LULUCF Regulation and removes the flexibility between the LULUCF sector and the effort sharing sectors.[250] Adopting this parliament's proposal would remedy one of the shortcomings of the current Regulation according to which Member States can increase harvesting and compensate their debits in the other sectors.

The additional flexibility granted to Finland is proposed to be discarded at the end of 2025. Consequently, the Commission proposal plans to halve the compensation compared to current arrangements (i.e. from 10 million tonnes of CO2 equivalent to 5 million tonnes) because of the reduced application period.[251] Finland has not published any response to this proposal so far.

4.3. Intermediate conclusion

It results from all of the above that the 'Fit for 55' proposed amendments of the RED II and the LULUCF Regulation remedy some of the shortcomings identified. However, some proposed revisions remain insufficient or do not provide suitable solutions. Still being under review by the Parliament and the Council, it is yet to see if and how the final provisions will refine the Commission's proposals and how forest-rich countries like Finland and Sweden will influence the outcome of the forest-based bioenergy provisions.

[250] European Parliament, 2021/0201(COD), Article 12(1)

[251] COM(2021) 554 final, Article 13(a)

5. Conclusion

The thesis aimed at understanding how the EU legal regime of forest-based bioenergy could become fit for climate change mitigation by looking at the current regulatory framework applicable to forest-based bioenergy, identifying the shortcomings of this framework and assessing how is the European Commission is addressing these shortcomings in the RED II and LULUCF revision proposals.

Forest-based bioenergy plays a key role in the energy transition and in meeting the EU renewable energy targets. Indirectly promoted by the EU legislation, forest biomass demand is increasing while European forest sinks are decreasing. To address this tension and the growing concern regarding the use of forest-based bioenergy, the RED II introduced a set of safeguards. These safeguards were aimed to address concerns over the sustainability and the climate impacts of the use of forest-based biomass for bioenergy. They are therefore meant to minimize the unsustainable use of bioenergy (sustainability criteria), ensure the preservation of carbon sinks (LULUCF criteria) and ensure that the use of forest-based bioenergy results in a reduction of GHG emissions compared to carbonized sources of energy (GHG emissions savings criteria).

To, inter alia, further ensure that the EU legal regime on forest-based bioenergy provides a solution to tackle climate change and does not hinder its mitigation, the EU introduced the LULUCF Regulation and its GHG accounting rules. Reconciling the diverging opinions of Member States, notably between forest-rich countries like Finland and Sweden, on emissions and removals accounting rules proved to be challenging. The LULUCF sector nonetheless emerged as the third pillar of the EU 2030 Climate and Energy Policy Framework and started to contribute to the achievement of the EU 2030 targets and the 2050 climate neutrality goal. This meant that emissions stemming from, inter alia, forestry activities for the production of bioenergy and removals by forests were going to be accounted for.
To achieve these targets and ensure the preservation of carbon sinks while, inter alia, producing forest-based bioenergy, the Regulation provides for the ‘no-debit rule’ and an accounting system revolving around the FRL and comprising flexibilities.

Both the RED II and the LULUCF Regulation proved to have several shortcomings, making the use of forest-based bioenergy unfit for climate change mitigation.

One of the main issues is the underpinning rationale of the legal regime according to which forest-based bioenergy is carbon neutral. This implicit assumption presumes that the emissions stemming from burning biomass are instantly compensated by the absorption of CO2 by sinks. Building on this erroneous assumption, emissions are only accounted for at the harvesting stage and not at combustion. As a result of the implementation of extant rules, forest-based bioenergy in the EU may increase CO2 in the atmosphere and exacerbate climate change.
Solely accounting emissions at harvesting also means that there is strong reliance on the accounting system under the LULUCF Regulation, which is problematic as the accounting for bioenergy emissions proves to be faulty. The FRL is a complex and partially inaccurate instrument, which leaves too much discretion to Member States. Being the sole accounting tool to account for Member States' GHG emissions, it makes the accounting system under the Regulation not robust enough and leaves emissions unaccounted for. Ultimately, it does not accurately reflect the climate impacts of forest-based bioenergy. The extant regulation of the sector further shows flaws as it provides flexibilities for Member States to achieve the 'no-debit rule', which weaken the LULUCF Regulation's climate integrity as Member States can either reduce their efforts in the other sectors or increase harvests and compensate it by increasing efforts in other sectors. This leads to the conclusion that the current legal regime is inadequate to mitigate climate change.

This thesis has demonstrated that the LULUCF Regulation undermines climate change mitigation by only requiring Member States to have a balance between emissions and removals. While recognizing that the regulation was the best that could be agreed on at the time of the negotiations and that the EU was at the forefront in regulating the complex LULUCF sector, it is important to highlight that the regulation lacks ambition given the state of emergency highlighted by the latest IPCC report.

The thesis has also reviewed in detail the flaws in RED II safeguards concerning the climate impacts of forest-based bioenergy. The narrow scope of the sustainability

criteria and the GHG emission savings criteria means that the majority of the EU installations producing forest-based bioenergy fall between the cracks. Additionally, the Directive merely requires forestry laws to be in place to fulfil one of the sustainability criteria and does not require Member States to apply the cascading approach. This greatly undermines these criteria and renders them ill-suited to minimize unsustainable uses of forest-based bioenergy. The LULUCF criteria are also prove to be inadequate to minimize the risk of negative impacts on forest carbon stocks.

Overall, this thesis demonstrates that the EU legal regime is currently not fit for climate change mitigation as its flaws undermine the achievement of the carbon neutrality goal and the protection of forests.

The 'Fit for 55' proposed amendments of the RED II and the LULUCF Regulation introduced in July 2021 in the framework of the Green Deal and currently under consideration by the European Parliament and the Council, however remedy some of the shortcomings identified, albeit still being insufficient or inadequate.

The proposal to reform the RED II notably addresses the concerns related to the scope of the RED II criteria, proposes applying the cascading approach to the use of forest biomass, limits support schemes for forest-based bioenergy and proposes rules to protect carbon-rich habitats, such as primary forests. These positive amendments still seem inadequate and do not make the EU legislation on forest-based bioenergy fully fit for climate change mitigation.
As regards to the LULUCF Regulation, while mostly unchanged until 2025, the proposed amendments to the current Regulation would remedy some of its main shortcomings, by abandoning the FRL and the 'no-debit rule' and by replacing the latter by national binding targets from 2026 onwards.

Whether or not these proposals will be adopted, improved or deleted at the end of the legislative process is yet to be seen but the Parliament's draft positions on the reforms and the discontent of the forest-rich countries like Finland and Sweden give us a glimpse of harsh negotiations ahead.

In order for the EU legal regime of forest-based bioenergy to be fit for climate change mitigation, these negotiations should recognize the carbon impact that forest-based bioenergy may have, both in terms of emissions and forest sinks reductions.

Alternative future legal solutions should include strengthening the set of criteria under the RED II to minimize the risk of using unsustainable forest biomass for the production of energy and eliminating its negative impacts on forest carbon stocks.

Future legal solutions should also include the establishment of transparent and accurate accounting rules to ensure that the actual carbon impact of forest-based bioenergy is understood.

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