Project Title:

Truly Carbon Neutral electricity enhanced Synthesis of Liquefied Natural Gas (LNG) from biomass

Project Acronym:

CarbonNeutralLNG

PUBLIC

Work Package 5

Deliverable 5.1

"Recommendations on Sustainability and Environmental Impact Assessment""

Responsible for Deliverable:

University of Graz, Austria

April 2024

This project has received funding from Horizon Europe under grant agreement No. 101084066.

Funded by the European Union. Views and opinions expressed are however those of the authors only and do not necessarily reflect those of the European Union. Neither the European Union nor the granting authority can be held responsible for them.

Content

1. Introduction

The production of bioLNG in the Member States of the European Union is subject to a complex legal regime that is significantly characterised by a large number of EU legal acts. Legal restrictions relating to the use of biomass as well as permit procedures of the necessary production facilities can represent significant obstacles to the deployment of the technology. Although, unlike e.g. for hydrogen, the existing infrastructure for fossil natural gas can be used for the utilisation of bioLNG, considerable investment and expansion is required, particularly with regard to the production facilities. To this end, it is necessary to carry out the relevant procedures without unnecessary delay in order to drive the expansion forward.

Legal certainty regarding permit procedures also represents a key factor in investment decisions. Uncertainty regarding regulatory requirements can contribute to delayed implementation of the envisioned technology, particularly as it represents an innovative technology whose legal handling is not directly and clearly specified by the relevant legal acts or case-law. Additionally, legal restrictions on the use of various biomass sources and the considerable administrative effort for verification and certification processes involved stand in the way of implementing further deployment of biomass-based biofuel technologies. It is therefore important to define sustainability criteria in such a way that preserving biodiversity and nature protection is ensured and land-use changes are avoided, but at the same time the simplified and transparent verification procedures can be applied.

The legal framework for the production of bioLNG is subject to recurring modification and improvement at both national and European level. The following sections outline the relevant legal framework for installations based on the CarbonNeutralLNG project concept, followed by recommendations for removing legal hurdles to the deployment of the envisioned technological concept. With the upcoming obligation to implement the RED III in particular, it is up to the Member States to create more enabling regulatory framework conditions for the deployment of bioLNG. This can make a significant contribution to the realisation of the vision of truly carbon-neutral LNG production and, more broadly, a contribution not only to decarbonization efforts within the European Union and worldwide, particularly in the transport sector with regard to heavy duty trucks and as maritime fuel, but also to independence on third-country fossil fuel imports and security of supply by substituting fossil natural gas.

1.1 Overview of relevant legislation

The use of renewable energy sources for the production of CarbonNeutralLNG is regulated by a comprehensive framework of secondary and tertiary EU legislation as well as implementing acts in the individual Member States. The relevant legislative framework was substantially modified only recently as a result of the EU's Fit for 55 package, including the latest amendment of the recast Renewable Energy Directive (RED II)[1] by Directive 2023/2413[2] (hereby referred to as RED III) which entered into force on 20 November 2023. Member states are obliged to implement the new provisions until 21 May 2025, with some specific provision already due for implementation until 1 July 2024.

Legislative Act	Key relevant contents	Last Amended by	Implementation period
Renewable Energy Directive[3]	- Renewable energy targets, including sector- and technology-specific targets - Sustainability and GHG emissions savings criteria - Acceleration areas and other measures to accelerate the deployment of renewables	Directive (EU) 2023/2413	21.5.2025 // 01.07.2024 (*)
Temporary Emergency Regulation[4]	- Measures to accelerate permit procedures for renewable energy production	Council Regulation (EU) 2024/223[5]	directly applicable until 30.06.2025
Environmental Impact Assessment Directive[6]	- Procedure for Environmental Impact Assessment - Criteria for determining obligations to carry out EIA	Amendment planned[7]	already implemented by Member States

* shorter period of implementation concerning Article 15e (concerning areas for grid and storage infrastructure necessary to integrate renewable energy into the electricity system) and Articles 16, 16b,16c, 16d, 16e and 16f (concerning various rules for permit-granting procedures for renewable energy installations)

[1] 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 (recast), OJ L 2018/328, 82.

[2] Directive (EU) 2023/2413 of the European Parliament and of the Council of 18 October 2023 amending Directive (EU) 2018/2001, Regulation (EU) 2018/1999 and Directive 98/70/EC as regards the promotion of energy from renewable sources, and repealing Council Directive (EU) 2015/652, OJ L 2023/2413

[3] 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 (recast), OJ L 2018/328, 82.

[4] Council Regulation (EU) 2022/2577 of 22 December 2022 laying down a framework to accelerate the deployment of renewable energy, OJ L 2022/335, 36.

[5] Council Regulation (EU) 2024/223 of 22 December 2023 amending Regulation (EU) 2022/2577 laying down a framework to accelerate the deployment of renewable energy, OJ L 2024/223.

[6] Directive 2011/92/EU of the European Parliament and of the Council of 13 December 2011 on the assessment of the effects of certain public and private projects on the environment (codification), OJ L 2012/26, 1.

[7] Proposal for a Directive of the European Parliament and of the Council amending Directive 2008/98/EC on waste, COM/2023/420 final. Last enacted amendment by Directive 2014/52/EU of the European Parliament and of the Council of 16 April 2014 amending Directive 2011/92/EU on the assessment of the effects of certain public and private projects on the environment, OJ L 2014/124, 1.

LULUCF[8]	- 'no debit'-rule for land-use changes	Regulation (EU) 2023/839[9]	directly applicable
Governance Regulation[10]	- Obligation to pursue NECPs with national targets for the deployment of renewables	Directive (EU) 2023/2413	directly applicable
Waste Framework Directive[11]	- Waste hierarchy relevant for use of biomass for biofuel production	Amendment planned[12]	already implemented by Member states
Delegated Regulation on ILUC[13]	- Specific rules on determining indirect land use change risks for biomass	-	directly applicable
Implementing Act on evidence for sustainability compliance[14]	- Operational guidance for demonstrating compliance with sustainability criteria - Voluntary schemes for verification	-	directly applicable

Tab. 1: Overview of key legislative acts and their relevant contents

[8] Regulation (EU) 2018/841 of the European Parliament and of the Council of 30 May 2018 on the inclusion of greenhouse gas emissions and removals from land use, land use change and forestry in the 2030 climate and energy framework, and amending Regulation (EU) No 525/2013 and Decision No 529/2013/EU, OJ L 2018/156, 1.

[9] Regulation (EU) 2023/839 of the European Parliament and of the Council of 19 April 2023 amending Regulation (EU) 2018/841 as regards the scope, simplifying the reporting and compliance rules, and setting out the targets of the Member States for 2030, and Regulation (EU) 2018/1999 as regards improvement in monitoring, reporting, tracking of progress and review, OJ L 2023/107, 1.

[10] Regulation (EU) 2018/1999 of the European Parliament and of the Council of 11 December 2018 on the Governance of the Energy Union and Climate Action, amending Regulations (EC) No 663/2009 and (EC) No 715/2009 of the European Parliament and of the Council, Directives 94/22/EC, 98/70/EC, 2009/31/EC, 2009/73/EC, 2010/31/EU, 2012/27/EU and 2013/30/EU of the European Parliament and of the Council, Council Directives 2009/119/EC and (EU) 2015/652 and repealing Regulation (EU) No 525/2013 of the European Parliament and of the Council, OJ L 2018/328, 1.

[11] Directive 2008/98/EC of the European Parliament and of the Council of 19 November 2008 on waste and repealing certain Directives, OJ L 2008//312, 3.

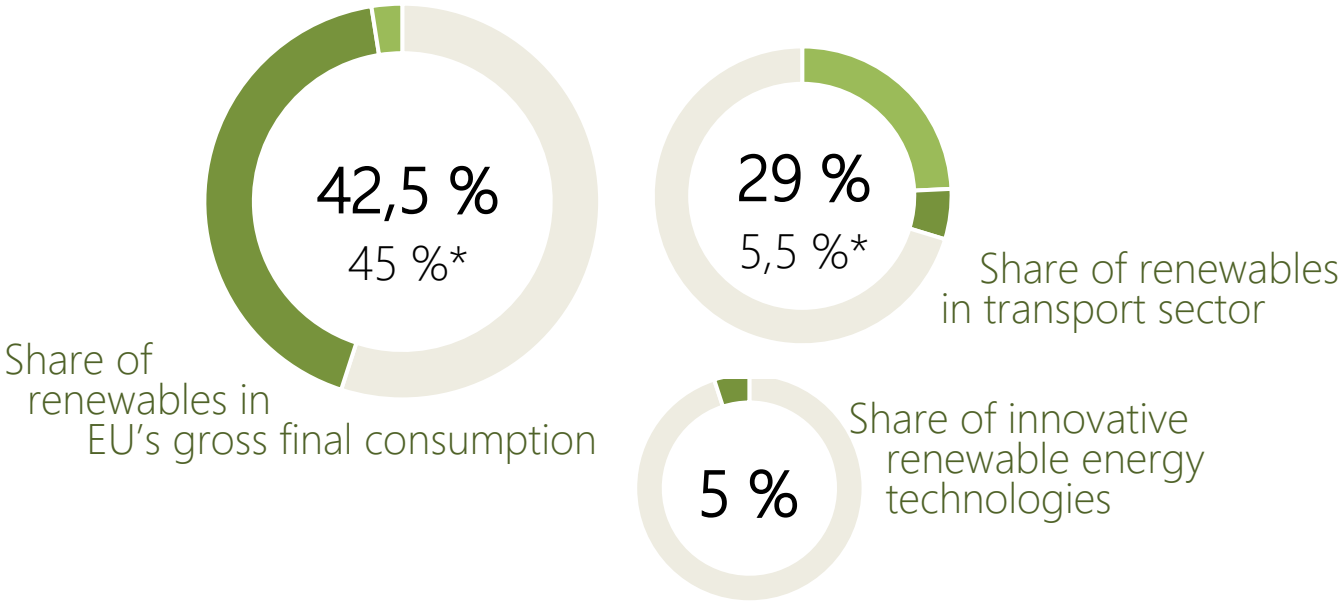
[12] Proposal for a Directive of the European Parliament and of the Council amending Directive 2008/98/EC on waste, COM/2023/420 final. Last enacted amendment by Regulation (EU) 2023/1542 of the European Parliament and of the Council of 12 July 2023 concerning batteries and waste batteries, amending Directive 2008/98/EC and Regulation (EU) 2019/1020 and repealing Directive 2006/66/EC, OJ L 2023/191, 1.

[13] Commission Delegated Regulation (EU) 2019/807 of 13 March 2019 supplementing Directive (EU) 2018/2001 of the European Parliament and of the Council as regards the determination of high indirect land-use change-risk feedstock for which a significant expansion of the production area into land with high carbon stock is observed and the certification of low indirect land-use change-risk biofuels, bioliquids and biomass fuels, OJ L 2019/133, 1.

[14] Commission Implementing Regulation (EU) 2022/2448 of 13 December 2022 on establishing operational guidance on the evidence for demonstrating compliance with the sustainability criteria for forest biomass laid down in Article 29 of Directive (EU) 2018/2001 of the European Parliament and of the Council, OJ L 2022/320, 4.

1.2 Targets

The amendment of RED continued and increased the EU's efforts in expanding renewable energy resources: the directive updated the overarching renewable energy target to achieving a share of energy from renewable sources in the Union's gross final consumption of energy of at least 42,5 % in 2030, aiming at a share of 45 %. Furthermore, the directive sets different sub-targets for different sectors and/or technologies.



While RED III determines targets for the share of energy from renewable sources in 2030 for the Union, it does not contain individual targets for each member state. Each member state has to define an overall national target as well as technology-specific sub-targets within the national Integrated Energy and Climate Plans pursuant to the Governance Regulation[15]. Compliance with set national targets is subject to review by the European Commission under the framework of the Governance Regulation.[16]

Further sector-specific targets oblige Member States to adhere to a certain share of renewables in the named sectors, often concretised by sub-targets for different energy carriers, with complex exemptions, possibilities for derogations, and varying rules of calculation applicable at different levels.

Sector-specific targets i.a. exist for:

- Industry: annual increase of 1,6 % (calculated as average for the periods 2021-2025 and 2026-20303
- Heating and Cooling: annual increase of 0,8 % as average from 2021 – 2025 and 1,1 % from 2026-2030
- District heating and cooling: annual increase of 2,2 % as average from 2021 – 2030.

[15] Art 3, 4 Governance Regulation.

[16] Concerning the shift from binding national targets to self-determined targets within the NECP, see Schlacke S, Knodt M: The governance system of the European Energy Union and climate action. Journal for European Environmental & Planning Law, 2019, 16(4), 323-339 (327).

- Transport: share of renewables of at least 29 % by 2030 within the final consumption, or GHG intensity reduction of at least 14,5 % by 2030

For transport, Member States are further obliged to comply with additional targets for different energy carriers, i.e.:

- Combined share of advanced biofuels and RFNBOs in transport of at least 1 % in 2025 and 5,5 % in 2030
- Share of RFNBOs alone of 1 % in 2030
- Share of RFNBOs supplied to the maritime transport sector of 1,2 % in 2030

- Non-binding target for Biomethane
  While RED III does not stipulate a binding target for biomethane, it mentions that the Directive aims at contributing to achieving a union-wide annual production of sustainable biomethane of 35 billion cubic meters by 2030.

Concerning RFNBOs, further sub-targets exist for example for industry. Additionally, different rules for calculating the share of renewables might apply for some energy carriers and sub-sectors: i.a., when calculating the share of renewables in the transport sector

- advanced biofuels, biogas produced from the same feedstock and RFNBOs shall be considered to be twice its energy content
- renewable electricity shall be considered to be four times its energy content when supplied to road vehicles and 1,5 times its energy content when supplied to rail transport
- the share of advanced biofuels and biogas produced from the same feedstock supplied in the aviation and maritime transport modes shall be considered to be 1,2 times their energy content and the share of RFNBOs shall be considered to be 1,5 times their energy content

Noticeably, although the directive stipulates in principle that Member States must promote and expand the development of both advanced biofuels and RFNBOs equally,[17] in many cases specific targets are set for RFNBOs but not for advanced biofuels (e.g. for industry or the maritime transport sector).

[17] For more details on the principle of technology neutrality, see Talus K, Pinto J, Gallegos, F: Realism at the end of the rainbow? An argument towards diversifying hydrogen in EU regulation. The Journal of World Energy Law & Business, 2024, jwae007, doi:10.1093/jwelb/jwae007.

1.3 Classification of CarbonNeutralLNG

Art. 2 RED III contains definitions for several types of renewable energy sources. The classification of CarbonNeutralLNG within the framework of RED III is essential for determining

(1) the applicable **renewable energy targets** to which the use of CarbonNeutralLNG can contribute

(2) the applicable framework of **sustainability and greenhouse gas emissions savings criteria**.

For the purpose of the project, the following definitions and distinctions are of particular relevance:

'biomass'[18]	the biodegradable fraction of products, waste and residues from biological origin from agriculture, including vegetal and animal substances, from forestry and related industries, including fisheries and aquaculture, as well as the biodegradable fraction of waste, including industrial and municipal waste of biological origin
'renewable fuels'[19]	biofuels, bioliquids, biomass fuels and renewable fuels of non-biological origin
'renewable fuels of non-biological origin'[20]	liquid and gaseous fuels the energy content of which is derived from renewable sources other than biomass
'biofuels'[21]	liquid fuel for transport produced from biomass
'advanced biofuels'[22]	biofuels that are produced from the feedstock listed in Part A of Annex IX
'bioliquids'[23]	liquid fuel for energy purposes other than for transport, including electricity and heating and cooling, produced from biomass
'biomass fuels'[24]	gaseous and solid fuels produced from biomass
'biogas'[25]	gaseous fuels produced from biomass
'recycled carbon fuels'[26]	liquid and gaseous fuels that are produced from liquid or solid waste streams of non-renewable origin which are not suitable for material recovery in accordance with Article 4 of Directive 2008/98/EC, or from waste processing gas and exhaust gas of non-renewable origin which are produced as an unavoidable and unintentional consequence of the production process in industrial installations
'low indirect land-use change-risk biofuels, bioliquids and biomass fuels'[27]	biofuels, bioliquids and biomass fuels, the feedstock of which was produced within schemes which avoid displacement effects of food and feed-crop based biofuels, bioliquids and biomass fuels through improved agricultural practices as well as through the cultivation of crops on areas which were previously not used for cultivation of crops, and which were produced in accordance with

[18] Art 2 para 24 RED III.
[19] Art 2 para 22a RED III.
[20] Art 2 para 36 RED III.
[21] Art 2 para 33 RED III.
[22] Art 2 para 34 RED III.
[23] Art 2 para 32 RED III.
[24] Art 2 para 27 RED III.
[25] Art 2 para 28 RED III.
[26] Art 2 para 35 RED III.
[27] Art 2 para 37 RED III.

the sustainability criteria for biofuels, bioliquids and biomass fuels laid down in Article 29

Accordingly, decisive factors for the classification of CarbonNeutralLNG are

- the initial **source** of energy/carbon (renewable – non-renewable)
- its physical **form** (liquid – solid - gaseous)
- its intended **purpose** (e.g. transport sector)

First, depending on the original energy and carbon sources renewable LNG produced by hybrid catalytic conversion of renewable energy can be classified as different types of renewable fuels under RED III. Although the definition in the directive mentions the energy content of the fuel in general, this is commonly interpreted as referring the feedstock on which the product is based.[28] Thus, further energy needed for the production process, i.e. electricity for gasification, does not preclude the categorization as 'biofuel', even if the electricity was not generated from biomass. Furthermore, only some biomass-based fuels can be qualified as 'advanced biofuels', depending on the type of biomass serving as carbon source.

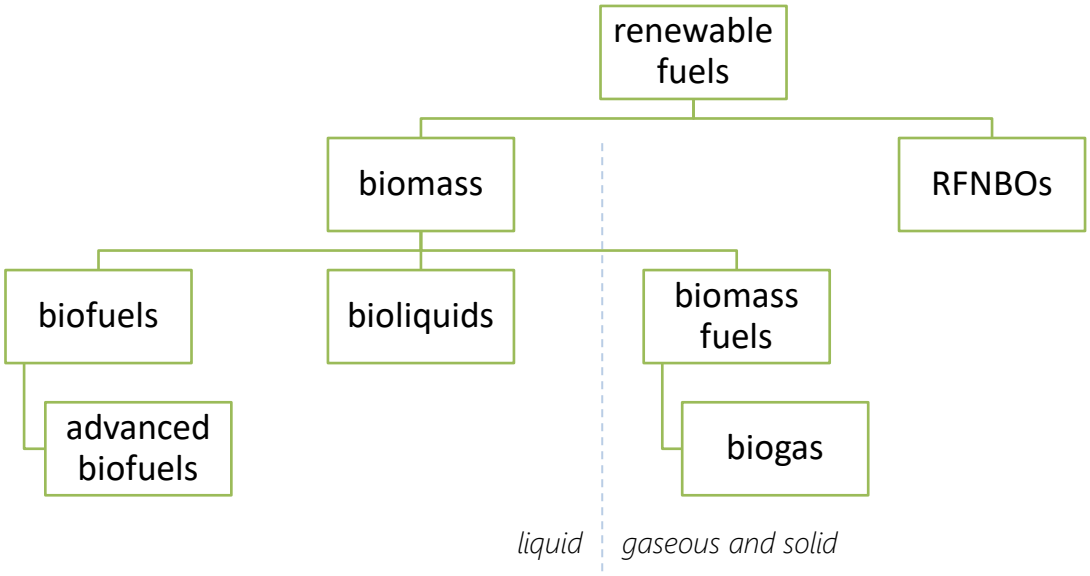


Fig. 1: Overview of the different classes of ‚renewable fuels' in RED III

In order to classify as '**advanced biofuels'**, fuels have to be produced from feedstock listed in Annex IX Part A. This list includes, i.a.

- Biomass fraction of industrial waste not fit for use in the food or feed chain, including material from retail and wholesale and the agro-food and fish and aquaculture industry, and excluding feedstocks listed in part B of this Annex (i.e. used cooking oil and certain types of animal fats)

[28] See Hurtig O., Buffi M., Scarlat N., Motola V., Georgakaki A., Letout S., Mountraki A., Joanny G, Clean Energy Technology Observatory: Advanced biofuels in the European Union – 2022 Status Report on Technology Development, Trends, Value Chains and Markets, Publications Office of the European Union, Luxembourg, 2022, doi:10.2760/938743, JRC130727, p. 1; Buffi, M., Scarlat N., Hurtig O., Motola V., Georgakaki A., Letout S., Mountraki A., Joanny G., Clean Energy Technology Observatory: Renewable Fuels of Non-Biological Origin in the European Union – 2022 Status Report on Technology. Development, Trends, Value Chains and Markets, Publications Office of the European Union, Luxembourg, 2022, doi:10.2760/76717, JRC130729, p. 7-9.

- Straw
- Nut shells
- Husks
- Cobs cleaned of kernels of corn
- Biomass fraction of wastes and residues from forestry and forest-based industries, namely, bark, branches, pre-commercial thinnings, leaves, needles, tree tops, saw dust, cutter shavings, black liquor, brown liquor, fibre sludge, lignin and tall oil
- other non-food cellulosic material (i.e., other feedstock mainly composed of cellulose and hemicellulose, and having a lower lignin content than ligno-cellulosic material, including food and feed crop residues; grassy energy crops with a low starch content; cover crops before and after main crops; ley crops; industrial residues, including from food and feed crops after vegetal oils, sugars, starches and protein have been extracted; and material from biowaste, where ley and cover crops are understood to be temporary, short-term sown pastures comprising grass-legume mixture with a low starch content to obtain fodder for livestock and improve soil fertility for obtaining higher yields of arable main crops)[29]
- other ligno-cellulosic material except saw logs and veneer log (i.e., other material composed of lignin, cellulose and hemicellulose, such as biomass sourced from forests, woody energy crops and forest-based industries' residues and wastes)[30]

This list of feedstocks is subject to a biennial review by the Commission: according to Article 28 para 6 RED III, the Commission can add (but not delete) other feedstock to this list in delegated acts. Thereby, the principles of circular economy and the waste hierarchy, the EU sustainability criteria for the origin of biomass as well as the need to avoid significant distortive effects on markets, negative impacts on the environment and biodiversity and creating an additional demand for land have to be taken into account. Lastly, the Commission also has to consider the potential for delivering substantial GHG emissions savings based on a LCA compared to fossil fuels.

Consequently, if solely biomass from forest waste and residues is used to produce CarbonNeutralLNG, it can be qualified as either '**advanced biofuel'** if intended for use as a transport fuel or '**bioliquid'**, if intended for use in other sectors as the transport sector. However, if other carbon or energy sources are to be utilised as feedstock to produce CarbonNeutralLNG (e.g. waste streams of non-renewable origin, or H2 produced from electrolysis), the end product is to be qualified accordingly, e.g. as recycled carbon fuel (RCF) or hybrid fuel.

In this case, it must be taken into account to what extent the bioLNG is produced from which feedstock and the corresponding share must be allocated to the various sub-targets for the different energy carriers. This leads to a not inconsiderable amount of work, which may limit flexibility in the use of different resources as feedstock for bioLNG production.

[29] See Art 2 para 42 RED III.
[30] See Art 2 para 41 RED III.

2. Sustainability criteria

2.1 RED III sustainability criteria

2.1.1. Relevance

Sustainability of the deployment of biogenic renewable energy resources under RED III builds up on two pillars:[31]

(1) Sustainability Criteria concerning the origin of biomass
(2) Greenhouse Gas Emissions Saving Criteria

Both criteria have to be fulfilled for biofuels, bioliquids and biomass fuels to be counted as contributing towards the renewable energy shares as well as respective targets and obligations of the Member States. Furthermore, eligibility for financial support for the consumption of biofuels, bioliquids and biomass fuels is dependent on the fulfilment of both criteria.

In general, sustainability criteria concerning the origin of biomass aim at preventing direct conversion of forests, wetlands, and other lands with high biodiversity value for biofuel production as well as indirect land-use changes.[32] Biomass fuels produced from waste and residues other than agricultural, aquaculture, fisheries and forestry residues. Hence, for theses products only GHG emissions saving criteria have to be fulfilled.[33]

Furthermore, for biomass fuels, the criteria are only applied in installations with certain minimum capacities, e.g. installations producing electricity, heating and cooling with a total rated thermal input equal to or exceeding 7,5 MW for solid biomass fuels and installations with a total rated thermal input equal to or exceeding 2 MW for gaseous biomass fuels. Installations producing gaseous biomass fuels only have to meet the criteria if reaching an average biomethane flow rate above 200 m^3 methane equivalent/h measured at standard conditions of temperature and pressure, namely 0 °C and 1 bar atmospheric pressure or the respective proportionate volumetric share of methane if the biogas is composed of a mixture of methane and non-combustible other gas.[34] Member States are allowed to decrease the minimum thresholds accordingly.[35]

2.1.2. Sustainability criteria concerning the origin of biomass

(a) LULUCF criteria

First of all, Art 29 para 1 subpara 6 RED III stipulates that all criteria apply irrespective of the geographical origin of the biomass. However, the use of domestic biomass has to be in line with the 'no debit' rule for

[31] RED III further strengthened sustainability criteria of RED II. For a critical review of RED II sustainability criteria, see Mai-Moulin T, Hoefnagels R, Grundmann P, Junginger M: Effective sustainability criteria for bioenergy: Towards the implementation of the european renewable directive II, Renewable and Sustainable Energy Reviews 138 (2021) 110645, doi:10.1016/j.rser.2020.110645.

[32] See, e.g., Santeramo F, Delsignore M, Imbert E, Lombardi M: The Future of the EU Bioenergy Sector: Economic, Environmental, Social, and Legislative Challenges, Robert Schuman Centre for Advanced Studies Research Paper, 2023, Nr. 2023_21, p 9.

[33] Art 29 para 1 subpara 2 RED III.

[34] See Art 29 para 1 lit a-c RED III.

[35] Art 29 para 1 subpara 5 RED III.

Member States under the LULUCF regulation, meaning that all accounted emissions from land use have at least to be compensated by the respective number of removals. Additionally, the production has to correspond with the policies and measures the Member State included in its Integrated National Energy and Climate Plan.[36]

All forest biomass for producing biofuels, bioliquids and biomass fuels has to be harvested in countries or regional economic integration organisations who are a Party to the Paris Agreement and have submitted a Nationally Determined Contribution that covers emissions and removals from agriculture, forestry and land use which ensures that changes in carbon stock associated with biomass harvest are accounted towards the country's commitment to reduce or limit greenhouse gas emissions as specified in the NDC. If the relevant NDC does not meet this criterion, alternatively national or sub-national laws applicable in the area of harvest to conserve and enhance carbon stocks and sinks and providing evidence that reported LULUCF-sector emissions do not exceed removals in accordance with Art 5 Paris Agreement may be sufficient, too.

Where such evidence is not available, forest biomass can also be considered sustainable if management systems are in place at forest sourcing area level ensuring that carbon stocks and sinks levels in the forest are maintained or strengthened over the long term.

Under the Delegated Regulation on ILUC, additional requirements for biofuels qualifying as sustainable are being set out.[37] This includes criteria for determining the high indirect land-use change-risk feedstock for which a significant expansion of the production area into land with high carbon stock is observed, general criteria for certification of low-ILUC risk biomass, the requirement of additionality for produced feedstock and auditing and verification requirements.

(b) Specific criteria for harvesting and concerning the status of areas of origin

Depending on the type of biogenic feedstock used for producing bioLNG, different criteria for assessing the sustainability of the product apply according to Art. 29 para. 2-7 RED III. In general, agricultural biomass may not be derived from land with a high biodiversity value as well as land with former high-carbon stock and former peatland, each time considering the state of the land in January 2008.[38]

This encompasses i.a.:[39]

- primary forest and other wooded land, namely forest and other wooded land of native species, where there is no clearly visible indication of human activity and the ecological processes are not significantly disturbed; and old growth forests as defined in the country where the forest is located
- highly biodiverse forest and other wooded land which is species-rich and not degraded, and has been identified as being highly biodiverse by the relevant competent authority, unless evidence is provided that the production of that raw material did not interfere with those nature protection purposes
- areas for nature protection purposes or for the protection of certain rare, threatened or endangered ecosystems or species, both unless evidence is provided that the production of the raw material did not interfere with the specific nature protection purposes

[36] Art 29 para 7a RED III.

[37] On the delegated ILUC Regulation, also see Fermeglia M, Perišić, M: Nature-based solution to man-made problems: Fostering the uptake of phytoremediation and low-iluc biofuels in the EU. Journal for European Environmental & Planning Law, 2023, 20(2), 145-167.

[38] See Art 29 para 3, 4 RED III.

[39] See Art 29 para 3 RED III.

The use of forest biomass as raw material for the production of biofuels, bioliquids and biomass fuels is restricted to countries where national or subnational regulations and monitoring and enforcement system ensure:

- the legality of harvesting operations
- forest regeneration of harvested areas
- that specific, designated areas for nature and biodiversity protection are protected
- harvesting operations follow specific sustainable forest management principles
- harvesting maintains or improves the long-term production capacity of the forest
- that forests in which the forest biomass is harvested do not stem from the lands eliminated from the production of agricultural biomass materials

Furthermore, the states of origin of biomass have to ensure that installations in these states producing biofuels, bioliquids and biomass fuels from forest biomass, issue a statement of assurance, underpinned by company-level internal processes that the forest biomass is not sourced from the lands eliminated from the production of agricultural biomass.

'Sustainable forest management principles' have to ensure that maintenance of soil quality and biodiversity is considered with the aim of preventing any adverse impacts. Harvesting of stumps and roots, degradation of primary forests, and of old growth forests as defined in the country where the forest is located, or their conversion into plantation forests and and harvesting on vulnerable soils has to be avoided.

Maximum threshold for large clear-cuts and locally, ecologically appropriate retention thresholds for deadwood extraction and requirements to minimise any adverse impacts on soil quality (including soil compation) and on biodiversity features and habitats by using appropriate logging systems have to be applied in the respective countries.

If evidence concerning the national legislative framework and its enforcement in the area of harvest is not available, forest biomass can be considered meeting the sustainability criteria if management systems at forest sourcing area level ensuring compliance with the above-mentioned criteria are in place instead, but with the following modifications:

- when raw materials are harvested on areas specifically designated for nature and biodiversity protection, evidence may be provided that the harvesting of that raw material does not interfere with the applicable nature protection purposes
- forests in which the forest biomass is harvested do not have to be located outside of areas eliminated from the production of agricultural biomass materials, and respective statements of installations producing biofuels, bioliquids and biomass fuels are not necessary.

- Verification schemes

  Economic operators are required to prove compliance with sustainability and GHG emissions savings criteria by means of mandatory independent and transparent audits. For this purpose, verification of compliance might be proven by voluntary national or international schemes approved by the Commission.

  Until now, 15 voluntary and national certification schemes are recognised for verification and applications for approval of further 12 schemes are pending. All schemes can be assessed on the website of the European Commission. However, approval of the scheme by the Commission does not constitute a necessary prerequisite for using the scheme for certification purposes. Member States may decide individually whether they accept a certain scheme, based on criteria outlined at Union level.

2.1.3. Greenhouse Gas Emissions Saving Criteria

In Article 31 as well as Annex V and VI, RED III contains specific rules to calculate greenhouse gas emissions saving from the use of biofuel, bioliquids and biomass fuels. While Annex V focuses on biofuels and bioliquids (i.e., liquid forms of renewable fuels), Annex VI contains rules for biomass fuels (i.e., gaseous or solid forms of renewable fuels). The different stipulated typical and default values as well as the applied methodology vary not only depending on applied technology and feedstocks, but also with regard to the use of the end product, e.g. as transport fuel, for heating and cooling or for the production of electricity. The Commission is empowered to add or revise default values and to modify the methodology by means of a delegated act pursuant to Article 35. Below, the calculation of GHG emissions savings for the production of biomass-based transport fuels will be outlined in more detail.

Annex V lit. C and Annex VI lit. B describe the methodology for calculating greenhouse gas emissions from the production and use of biofuels and biomass fuels respectively as follows:

$$E = e_{ec} + e_l + e_p + e_{td} + e_u - e_{sca} - e_{ccs} - e_{ccr}$$

E = total emissions from the use of the fuel;
e_{ec} = emissions from the extraction or cultivation of raw materials;
e_l = annualised emissions from carbon stock changes caused by land-use change;
e_p = emissions from processing;
e_{td} = emissions from transport and distribution;
e_u = emissions from the fuel in use;
e_{sca} = emission savings from soil carbon accumulation via improved agricultural management;
e_{ccs} = emission savings from CO_2 capture and geological storage; and
e_{ccr} = emission savings from CO_2 capture and replacement.

Subsequently, greenhouse gas emissions savings from biofuels/biomass fuels used as transport fuels are being calculated as follows:

$$SAVING = (E_{F(t)} - E_B) / E_{F(t)}$$

E_B = total emissions from the biofuel/biomass fuels used as transport fuels; and
$E_{F(t)}$ = total emissions from the fossil fuel comparator for transport

The savings values are therefore calculated using as holistic an approach as possible, which also includes indirect emissions, for example from the type of agricultural management and carbon stock changes. Only the emissions generated by the manufacture of machinery and equipment are not included in the calculation.

For calculating GHG emissions savings for different types of biofuels, Annex V stipulates disaggregated default values for e_{ec}, e_p and e_{td} concerning several established biofuels (e.g., sugar beet ethanol, corn ethanol, rape seed biodiesel, etc. as well as several future biofuels that were not or only in negligible quantities on the market in 2016, e.g. wheat straw ethanol, waste wood Fischer-Tropsch diesel, or waste wood dimethylether (DME). However, Annex V does not contain any it does not contain any directly applicable values for the CarbonNeutralLNG process, which is due to the novelty of the technology.

Annex VI (applicable for calculating the GHG impact of biomass fuels) stipulates typical and default values of GHG emissions savings for biomass fuels that are produced with no net-carbon emissions from land-

use change; including woodchips from forest residues and stemwood, when used for electricity or heat. It further determines typical and default values for GHG emissions savings for biomethane for transport, depending on different technological options for the production of biomethane from wet manure, maize (whole plant) and biowaste. Again, the technological options mentioned in the table do not apply for the relevant technology in CarbonNeutralLNG.

(a) Emissions from the extraction or cultivation of raw materials (e_{ec}) and from the fuel in use (e_u)

For calculating emissions from the extraction or cultivation of raw materials, emissions concerning the extraction or cultivation process itself, the collection, drying and storage of raw materials, waste and leakages as well as the production of chemicals or products used in extraction or cultivation are to be included. As the CO_2-emissions of the fuel in use (e_u) are to be counted as zero, the capture of CO_2 in the cultivation of raw materials has to be excluded from the calculation of e_{ec}.

For forestry biomass, estimations of emissions may also be derived from the use of averages calculated for geographical areas at national levels instead of actual values.

(b) Emissions from processing (e_p)

As defined in Annex VI lit. B para 11, emissions from processing are to be calculated including emissions from the processing itself as well as waste and leakages and from the production of chemicals and products used in processing.

Concerning the consumption of electricity not produced within the biomass fuel production, generally an average consideration is applied: the GHG emission intensity of the production and distribution of that electricity equals the average emission intensity of the production and distribution of electricity in the defined region. However, producers may use an average value for individual electricity production plants if the electricity used in the production of the biomass fuel comes from an electricity production plant not connected to the electricity grid.

(c) Emissions from transport and distribution (e_{td})

This value includes all emissions from transport of raw and semi-finished materials as well as storage and distribution of finished materials.

(d) Application to CarbonNeutralLNG

As CarbonNeutralLNG focuses on sustainable farmed wood-base biomass from forest residues and biowaste instead of agricultural feed/non-feed crops, emissions from carbon stock changes caused by land-use changes are of minor relevance. Major factors for calculating GHG emissions savings are emissions from the extraction or cultivation of raw materials as well as processing, transport and distribution emissions.

Annex V does not stipulate typical or default values applicable for the CarbonNeutralLNG technology. Although this is also the case for Annex VI, its lit. A defines typical and default values of GHG emissions savings for different types of wood-based biomass fuels, including woodchips and wood pellets from forest residues and stemwood as well as agricultural residues that can provide a rough indication for comparing estimated or calculated GHG emission savings for the technology.

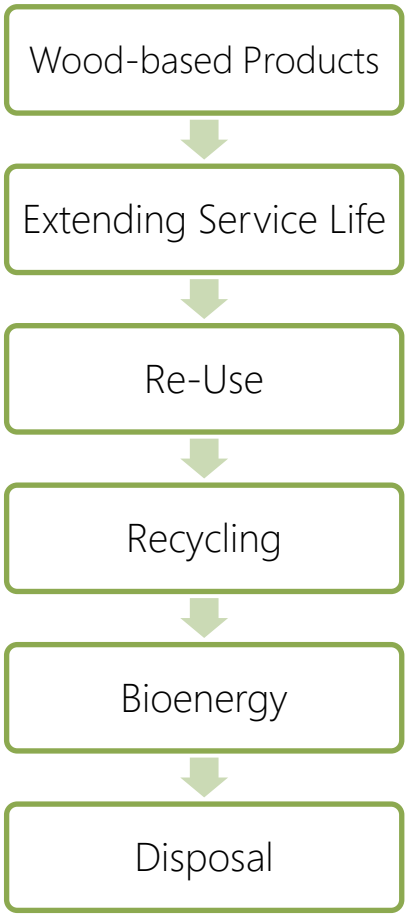
The current rules for calculating GHG emissions, however, do not allow for the full display of the Zero Emissions Approach applied in the CarbonNeutralLNG project due to restricted accountability for the use of renewable electricity in production (only if the respective electricity plant is not connected to the grid).

2.2 Cascading use of biomass

The revision of the Renewable Energy Directive puts further emphasis on resource efficiency of biomass use by substantiating the waste hierarchy established by Directive .... for sources of woody biomass. The **principle of cascading use of biomass** requires member states to prioritise the material use of woody biomass over the use for producing energy.

This applies also to the production of bioLNG: woody biomass is only to be used for producing CarbonNeutralLNG when it is not usable for the production of wood-based products, or recycling. Although the term 'recycling' is not defined in RED III, a systematic interpretation in accordance with Directive (waste) 2008/98/EC shows that the production of bioLNG is not covered by the term 'recycling'. While it generally encompasses measures to reprocess biomass materials into products, materials or substances also for other than their original purposes, energy recovery and the production of materials to be used as fuels are explicitly excluded.[40]

Thus, in order to use woody biomass for producing bioLNG in accordance with the principle of cascading use of biomass, any other material use, including the use of wood chips from forest residues for the production of wood panels and other wooden products,[41] must prove infeasible.



Art. 3 para 3 RED III

- **Focus on support schemes**
  While RED III generally requires member states to 'ensure' the cascading use of biomass, the Directive thereby puts an emphasis on **support schemes.** Accordingly, the directive does **not contain a general restriction or ban** on the energetic use of biomass outside the cascade, but primarily limits the financial support provided by the member states in this respect.

- **Exceptions to guarantee security of supply**
  With regard to the prevailing national specificities, member states are able to implement derogations from the cascading principle under 'duly justified circumstances', including purposes of securing energy supply. An exceptional shortage of fossil LNG thus may enable member states to support the production of bioLNG using woody biomass resources outside of the cascade.

[40] Art 3 para 17 Directive 2008/98/EC: recycling' means any recovery operation by which waste materials are reprocessed into products, materials or substances whether for the original or other purposes. It includes the reprocessing of organic material but does not include energy recovery and the reprocessing into materials that are to be used as fuels or for backfilling operations.

[41] See Camia A., Giuntoli, J., Jonsson, R., Robert, N., Cazzaniga, N.E., Jasinevičius, G., Avitabile, V., Grassi, G., Barredo, J.I., Mubareka, S., The use of woody biomass for energy purposes in the EU, EUR 30548 EN, Publications Office of the European Union, Luxembourg, 2021, doi:10.2760/831621, JRC122719, p. 48; and European Commission, Directorate-General for Internal Market, Industry, Entrepreneurship and SMEs: Guidance on cascading use of biomass with selected good practice examples on woody biomass, Publications Office, 2018, doi:10.2873/68553, p. 14.

3. Environmental Impact Assessment Procedures

3.1 EIA Directive

As a part of the permit procedure for renewable energy projects which are likely to have significant effects on the environment have to undergo mandatory Environmental Impact Assessment (EIA). For some projects, the directive itself provides for mandatory assessments;[42] e.g.:

- Pipelines with a diameter of more than 800 mm and a length of more than 40 km for the transport of gas, oil, chemicals
- Thermal power stations and other combustion installations with a heat output of 300 megawatts or more
- Waste disposal installations for the incineration or further specified chemical treatment[43] of non-hazardous waste with a capacity exceeding 100 tonnes per day.

For other specific projects, it is up to the member states to determine whether, above a certain threshold or on the basis of a case-by-case examination, the project is subject to mandatory assessment.[44] This applies, i.a., to:

- Industrial installations for the production of electricity, steam and hot water
- Industrial installations for carrying gas, steam and hot water
- Installations for hydroelectric energy production
- Installations for the harnessing of wind power for energy production (wind farms)

Accordingly, the construction of plant to produce bioLNG from biomass[45] as well as the construction of other renewable energy plants (e.g. hydroelectric energy production or wind farms) fall under the scope of the EIA directive. The exact threshold values and precise regulations as to the size of a project above which it is subject to mandatory EIA vary from Member State to Member State. Depending on the exact technical characteristic, biogas or biofuel projects may already be subject to mandatory EIA under Annex I, so that the Member States have no discretion in this respect. [46]

In addition to nature conservation projects and the associated nature impact assessment, the obligation to carry out EIAs, which are accompanied by a comprehensive survey of environmental impacts as well as participation rights for the affected public, is considered as a significant cause of delay to permit procedures. Thus, recent measures of the EU aim at avoiding EIA procedures for individual installations and shift such impact assessments to SEA at the planning level.

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[42] Projects listed in Annex I EIA Directive.
[43] See Annex I D 9 Waste Directive.
[44] Projects listed in Annex II EIA Directive
[45] For biogas plants, see also Parliamentary question - P-003441/2022(ASW) (25.11.2022), available at https://www.europarl.europa.eu/doceo/document/P-9-2022-003441-ASW_EN.html.
[46] European Commission, Directorate-General for Environment: Guidance on Interpretation of definitions of project categories of annex I and II of the EIA Directive, Publications Office, 2015, doi:10.2779/5854181, p. 10.

3.2 Temporary Emergency Regulation

3.2.1. Background and temporal scope of application

In response to the Russian war of aggression against Ukraine and the resulting disruption to the global energy market, the European Commission adopted a plan in May 2022 to reduce the EU's dependence on Russian gas imports and strengthen the European Union's energy independence ("REPowerEU")[47]. This included a proposal for a further amendment to RED II, intending to oblige the Member States to designate "go-to"-areas for renewable energies in which simplified permit procedure requirements apply.

As the legislative process to amend RED II had not yet been completed by the end of 2022, the Council adopted Council Regulation (EU) 2022/2577 of 22 December 2022 establishing a framework for the accelerated development of the use of renewable energy (Emergency Regulation) on a proposal from the Commission. The Regulation is based on the emergency powers under Article 122(1) TFEU and should contribute to ensuring security of supply in the European Union and reducing dependence on gas imports from Russia. To this end, the Regulation provides for temporary emergency provisions to speed up the procedure for granting permits for the production of energy from renewable energy sources. Originally, the Emergency Regulation was to expire 18 months after its entry into force, i.e. on 30 June 2024; Council Regulation (EU) 2024/223 of 22 December 2023 amending Regulation (EU) 2022/2577 establishing a framework for the accelerated development of the use of renewable energy - also based on Art 122 (1) TFEU - amended parts of the Emergency Regulation and extended it by one year. Both legal acts underline that the guiding principle and driver of the energy transition is no longer just combating global climate change, but also the Union's energy dependency and ensuring security of supply.

The Emergency Regulation lays down temporary emergency rules to fast-track permit process for the production of energy from renewable energy sources, with particular attention to certain renewable energy technologies or certain types of renewable energy projects that can accelerate the development of renewable energy in the Union in the short term, other than biomass (e.g. solar energy systems and heat pumps). In addition, the Emergency Regulation lays down general rules to speed up permit procedures, e.g. by clarifying that the expansion of renewable energy is in the overriding public interest, and allowing derogations and exemptions from provision aiming at environmental, nature and biodiversity protection.

3.2.2. Overriding public interest

First, the Emergency Regulation clarifies by a rebuttable presumption that the planning, construction and operation of installations and facilities for the production of energy from renewable sources and their connection to the grid, the grid itself and the storage facilities are in the overriding public interest and serve public health and safety, thus allowing for exemptions under the habitats and birds protection regimes.[48] This presumption applies as long as there is no clear evidence that those projects have major adverse effects on the environment which cannot be mitigated or compensated for[49] and, according to

[47] On the significance of biomethane for the purpose of REPowerEU, see de Almeida L, van Zeben J: The EU's circular energy system and the Green Deal. In Law in the EU's Circular Energy System, pp. 1-15. Edward Elgar Publishing. 2023, doi:10.4337/9781802205879.00008.

[48] See Art 6 para 4 and Art 16 para 1 (c) Habitats Directive (Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora, OJ L 1992/206, 7); Art 4 para 7 Water Framework Directive (Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for Community action in the field of water policy, OJ L 2000/327, 1), and Art 9 para 1 (a) Birds Directive (Directive 2009/147/EC of the European Parliament and of the Council of 30 November 2009 on the conservation of wild birds (Codified version), OJ L 2010/20, 7.

[49] See Recital 8 Emergency Regulation.

the wording, extends to both the expansion of renewable energy and the expansion of the grid. This is intended to allow such projects to benefit, where necessary, from a simplified assessment for specific derogations foreseen in the relevant Union environmental legislation with immediate effect. The Member States are authorised to limit the presumption in accordance with their National Energy and Climate Plans to certain types of technologies or projects with certain technical characteristics.

According to Article 3(2) of the Emergency Regulation, in the case of projects of overriding public interest within the meaning of Article 3(1) of the Emergency Regulation, Member States shall ensure that the construction and operation of plants and facilities for the production of energy from renewable sources and the associated expansion of the grid infrastructure are given priority in the planning and permitting procedure when weighing up the legal interests on a case-by-case basis. In addition, the member states are authorised to give priority to projects other than those mentioned in Art. 3 para. 1 of the Emergency Regulation in the case-by-case assessment of legal interests (cf. the wording "at least"): the member states can therefore - by means of national regulations - also prioritise projects that are comparable to those mentioned in Art. 3 para. 1 of the Emergency Regulation.

As part of the balancing of interests, which must still be carried out, projects within the meaning of Art. 3 para. 1 of the Emergency Regulation and other projects prioritised by the respective member state are given greater weight ("priority") than other, opposing environmental interests. However, the restriction that, with regard to species protection, projects are only given priority if and to the extent that appropriate species conservation measures contributing to the maintenance or restoration of the populations of the species at a favourable conservation status are undertaken and sufficient financial resources as well as areas are made available for that purpose.[50]

3.2.3.Acceleration of permit procedures

The Emergency Regulation further authorises Member States to provide for exemptions from mandatory EIA and mandatory assessments of species protection under three (cumulative) conditions:

- exemptions can only be provided for renewable energy projects and projects in the field of energy storage and electricity grids that are necessary for the integration of renewable energy into the electricity system
- the project has to be located in a renewable energy area or a grid infrastructure area that is necessary for the integration of renewable energy into the energy system and this area has been subject to a Strategic Environmental Assessment (SEA)[51]
- the competent authority must then ensure that - based on the available data - suitable and proportionate mitigation measures are taken to ensure compliance with species and birds protection[52]

The applicability of the acceleration provisions of the Emergency Regulation therefore requires action by the respective member state: only if it has designated areas for renewable energy or grid infrastructure areas in plans and these plans have undergone a SEA can the Member State concerned provide for exemptions from the environmental impact assessment and species protection assessments for projects realised in these areas.

[50] See Art 3 para 2 Emergency Regulation.
[51] See Directive 2001/42/EC
[52] Art 12 para 1 Habitats Directive and Art 5 Birds Directive.

Mitigation measures must be determined on the basis of existing data; additional surveys or assessments to determine suitable and proportionate mitigation measures are excluded. If such measures are not available, the competent authority must ensure that the operator pays financial compensation for species protection programmes to ensure or improve the conservation status of the species concerned. Hence, the assessment of alternatives provided for a derogation from environmental provisions of Union law is severely restricted: alternatives are only to be examined to a very limited extent under the Emergency Regulation; as a rule, the alternative assessment will only lead to minor optimisations to the respective project.

In general, the Emergency Regulation thus makes it considerably easier to derogate from provisions on habitat protection, species protection and water protection: the balancing of opposing interests (protection of biodiversity or environmental protection vs. climate protection or energy transition) to be carried out in the event of a derogation is significantly predetermined by the legal presumption of an overriding public interest or an interest in health and safety; as a rule, the interests in habitat protection, species protection

Consequently, the Emergency Regulation authorises the Member States to make particularly drastic interventions in existing protection standards: Member States can determine the (complete) cancellation of the species protection assessment in certain areas designated by them that have been subject to a strategic environmental assessment. In this case, mitigation measures must be taken or, if such measures are not available, the operator is obliged to pay financial compensation. For the first time, it is now possible to derogate prohibitions under species protection law by means of financial payments.

However, these exemptions only apply to renewable energy installations, not nature and biodiversity protection regulations applicable for the harvesting of biomass.

3.3 RED III

The latest amendment of the Renewable Energy Directive, adopted at the end of last year, provides for significant improvements to permit procedures for renewable energy projects. The relevant provisions are intended to significantly speed up the permit procedures. In particular, the following measures comprise of

- Standardisation of the 'overriding' public interest in the expansion of renewables
- Coordinated Mapping of potentials for the expansion of renewables
- Designation of acceleration areas
- Strict deadlines for the maximum duration of the administrative permit procedures

As already envisioned in the Emergency Regulation, these measures shift the assessment of the potential environmental impact of a project to the planning level: the relevant expected environmental impacts of a renewable energy project already have to be assessed when the acceleration areas are designated; in the subsequent project-related permit procedure, only a significantly reduced assessment of the environmental impact of a project is carried out.

3.3.1. Identification of renewable energy potentials

RED III initially obliges the Member States to carry out a coordinated mapping of areas for the expansion of renewable energies and the associated infrastructure (in particular grid and storage facilities) by 21 May 2025. Potentials must be taken into account at least to the extent necessary to achieve the national contributions to the overall EU target by 2030.

Existing spatial planning documents can be used to identify the areas; in addition, coordination between all relevant national, regional and local authorities and entities, including network operators, shall be ensured.

A particular focus should be placed on taking into account the potential for multiple utilisation of the areas concerned. For example, artificial and built surfaces should also be prioritised for energy generation purposes.

- **Mandatory Assessment of national forest biomass resources**
  RED III also contains binding requirements for the assessment of biomass potentials. Until 30 June 2024, member states shall assess the domestic supply of forest biomass available for energy purposes in 2021 – 2030. This this analysis is part of the National Integrated Energy and Climate Plans and subject to mandatory progress reporting by the member states.

3.3.2. Renewables acceleration areas

(a) Designation of new renewables acceleration areas

Following the mapping of renewables potential, those areas in which it can be assumed that the construction of one or more types of renewable energy installations is unlikely to have a significant environmental impact are to be identified and designated as a sub-type of potential areas, that is as 'renewables acceleration areas'. The Member States are free to exclude plants for the combustion of biomass as well as hydropower plants for this purposes. As part of the identification and designation of these areas, the Member States must give priority to artificial and sealed surfaces such as roofs and facades of buildings, transport infrastructure areas, car parks, farms, landfill sites and the like. In addition, acceleration areas may not be located in NATURA 2000 areas or other areas designated under national nature conservation programmes or on main bird migration routes; this again excludes artificial and built-up areas (e.g. car parks).[53]

All appropriate and proportionate instruments and data sets shall be used for the designation of the areas in order to assess the environmental impact of installations for the production of energy from renewable sources. In addition, as part of the designation of the acceleration areas, suitable rules for effective mitigation measures must be defined for the respective areas, with the help of which possible negative environmental impacts can be avoided or, if this is not possible, significantly reduced. These must be geared to the specific characteristics of the respective areas, the type or types of technologies for which these areas are to be designated and the environmental impacts identified. The procedure for designating fast-track areas must include a SEA and, if necessary, a nature impact assessment.[54]

[53] See Art 15c para 1 RED III.
[54] See Art 15c para 2 RED III.

Overall, the fast-track areas do not have to encompass all of the potential required to achieve the national objectives, but must nevertheless be of a "significant size" in order to "contribute" to the national objectives.[55]

(b) Pre-existing areas

By 21 May 2024, the Member States can declare certain areas that have been qualified as particularly suitable for the accelerated use of one or more renewable energy technologies on the basis of national provisions as acceleration areas. For this purpose, the relevant plans for the designation of the areas must have previously undergone a strategic environmental assessment and, if applicable, a nature impact assessment. In addition, the areas in question must be outside Natura 2000 and national nature conservation areas and outside designated bird migration routes. Finally, it must also be ensured that appropriate and proportionate rules and measures are applied to the projects concerned within the areas in order to counteract possible adverse environmental impacts.[56]

3.3.3. Overriding public interest

Based on Art 3 Emergency Regulation, RED III now also contains a provision stating that the expansion of renewable energy is in the 'overriding public interest' (Art 16f RED III). This applies until climate neutrality is achieved and, moreover, irrespective of whether the project in question is located inside or outside acceleration zones. In this context, it should be noted that, unlike the Emergency Regulation[57], RED III no longer explicitly standardises the consequences of the 'overriding' public interest for the balancing of interests.

3.3.4. Projects outside of renewables acceleration areas

Regulations designed to streamline the permitting procedure also apply to projects outside of acceleration areas. Firstly, it is stipulated that if an EIA or assessment of nature or species protection is required, this is carried out in a single procedure that combines all relevant assessments for the project in question. Prior to the assessment, the authority must issue an opinion on the scope and level of detail of the information that the project applicant must include in the environmental impact assessment report (environmental impact statement), taking into account the documents submitted by the project applicant. Subsequently, no further information may be requested.[58]

Furthermore, if the "necessary" mitigation measures have been taken as part of a project, killing and disturbance within the meaning of the Habitats and Birds Directives are not considered intentional. The term "necessary" measure is not directly defined in more detail; however, it can be assumed that killing or disturbance is still to be expected despite the measures taken, otherwise the subsequent clarification would be invalid. This results in a reduction in the standard of protection in accordance with the Habitats Directive and the Birds Directive, even outside of areas subject to special protection measures.

[55] Art 15c para 3 RED III.
[56] See Art 15c para 4 RED III.
[57] Art 3 para 2 Emergency Regulation.
[58] See Art 16b RED III.

3.3.5. Duration of permit procedures

For projects inside and outside of acceleration zones as well as for certain technologies (solar energy plants, heat pumps) and repowering, RED III standardises deadlines within which the approval procedure must be completed. This includes all relevant administrative authorisations for the construction, repowering and operation of installations.[59]

It should be noted that the term 'permit-granting procedure' only covers the procedure at administrative authority level, starting with the confirmation of the completeness of the authorisation application through to the issuing of the decision by the competent authority; court proceedings, on the other hand, are not included in the relevant duration of the procedure.[60] In this context, appeals and legal remedies are subject to the most expeditious administrative and judicial procedure that is available at the relevant national, regional and local level.[61] Administrative decisions in the context of the authorisation procedures referred to in RED III must also be made publicly accessible.[62]

(a) Inside renewables acceleration areas

Within fast-track areas, authorisation procedures may not take longer than 12 months; however, in 'cases duly justified by exceptional circumstances', an extension of a maximum of 6 months is permitted.

For projects concerning

- Repowering of installations for the generation of renewable energy,
- new installations with an electricity generation capacity of less than 150 kW,
- energy storage facilities at the same site (including facilities for storing electricity and heat)
- their grid connection

the respective permit procedure must not take longer than 6 months. Again, an extension, in this case by 3 months, is possible in cases duly justified by exceptional circumstances. The directive also provides examples of the latter that may justify an extension: for example, an extension should be possible for overriding safety reasons if a repowering project has a significant impact on the grid or the original capacity, size or output of the installation.[63]

(b) Outside of renewables acceleration areas

A maximum duration of 2 years is provided for renewable expansion projects that are located outside of acceleration areas. Here too, an extension of a maximum of 6 months is permitted in cases where this is duly justified by exceptional circumstances. This applies in particular to those cases in which the circumstances require longer periods for the examinations required under the applicable environmental regulations of the Union.[64]

For those projects for which shorter deadlines are already provided for within fast-track areas, shorter deadlines also apply outside fast-track areas, namely a maximum duration of the permit procedure of 12 months; again with the possibility of an extension of a maximum of three months.[65]

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[59] See Art 16 para 1 RED III.
[60] Art 16 para 8 RED III.
[61] Art 16 para 6 RED III.
[62] Art 16 para 9 RED III.
[63] See Art 16a RED III.
[64] Art 16b para 1 RED III.
[65] See Art 16b para 2 RED III.

3.3.6. Assumption of Approval

For certain individual stages ("specific intermediate administrative steps") of the authorisation procedure in fast-track areas as well as for certain types of renewable energy installations, a fictitious authorisation is also provided for; however, this is only insofar as the national law of the Member States concerned provides for the principle of administrative tacit approval.[66]

This includes, for example, the procedural stage for checking the completeness of the application documents as well as the screening process. However, for projects concerning renewable energy installations within fast-track areas that are not already covered by a technology-specific presumption of authorisation, the final decision on the outcome of the authorisation procedure must be made explicitly; tacit consent is not possible here.[67]

[66] Art 16a para 6 RED III.
[67] Art 16a para 6 RED III.

4. Key recommendations

1. Improving targets concerning renewable energies with regard to the envisioned energy carrier and targeted sectors

   The CarbonNeutralLNG project identified the maritime sector as a promising potential sector for using the produced fuel in order to decarbonise the sector. However, RED III currently only stipulates targets for the use of RFNBOs in the maritime sector. Additional targets aiming at raising the share of advanced biofuels for shipping may contribute to cover the increasing demand of liquid fuels for example for ferries and cruise ships, thus contributing to decarbonization efforts. The same applies for example for sub-targets of RFNBOs in the industry.

2. Allowing for improved representation of the applied Zero Emissions Approach when calculating GHG emissions savings from CarbonNeutralLNG use

   At the moment, the rules for calculating GHG emissions savings for biofuels do not allow for the representation of the Zero Emissions Approach envisioned in CarbonNeutralLNG. While this is intended to avoid double-counting of renewable energy, it prevents the effective implementation of such innovative approaches, as the legal framework in general does not distinguish between renewable and non-renewable sources of energy supply for the biomass plants, for example. Better representation of the Zero Emissions Approach at a regulatory level might raise incentives for the deployment not only of the biofuel production technology itself, but a fully carbon-neutral Life Cycle of the CarbonNeutralLNG.

3. Renewable energy purchase agreements for combination of wind/PV/water and biomass

   In line with this, the possibility of being able to ensure the sustainability of the energy used by means of contractual solutions should also be granted for advanced biofuels in particular. Currently, the use of renewable energy plants for supplying electricity to the biomass plant may only be considered if the respective plant is not connected to the grid. However, this may significantly impede the effective deployment of the renewable power plant, especially if electricity should only be used for the bioLNG production in times of overabundance of the renewable energy source.
   Alternatively, and in parallel to the regulations governing the sustainable production of RFNBOs,[68] the use of fully renewable electricity for the production could also be secured by making use of

[68] See Article 3 and Article 4 Commission Delegated Regulation (EU) 2023/1184 of 10 February 2023 supplementing Directive (EU) 2018/2001 of the European Parliament and of the Council by establishing a Union methodology setting out detailed rules for the production of renewable liquid and gaseous transport fuels of non-biological origin, OJ L 2023/157,11, for more details. See also Hancher, L: EU energy governance—moving targets and flexible ambitions between opacity and opportunism? Yearbook of European Law, 2022, 41, 162-196, doi:10.1093/yel/yeac010.

renewable energy purchase agreements in which the producer of bioLNG agrees to purchase renewable energy directly from a producer or other, similar conditions.

4. Standardised verification for cascading principle

RED III contains several facilitations for verifying compliance with sustainability criteria concerning the origin of biomass. However, the application of the cascading principle further restricts the use of woody biomass for energetic purposes, as the production of biofuels. In order to simplify verification of compliance with the cascading principle and the waste hierarchy, standardised verification procedures and certifications or derogations could be made available for types of woody biomass with restricted potential for re-use, thus limiting administrative efforts for types of biomass that only provide limited potential for non-energetic usages.

5. Acceleration for plants combining different technologies

At the moment, plans and strategies for the expansion of renewables focus either on one or several specific technologies (e.g., wind and/or PV) with different criteria for the respective technologies, but do not explicitly address combined or juxtaposed hybrid plants producing several types of renewable energy at one location, as for example a wind turbine next to a plant for producing biomass-based fuels.

A stronger focus on innovative hybrid technologies in the planning and permitting phases could avoid long-distance transports and thus further contribute to emissions savings and pave the way for the deployment of technological enhancements.

6. Assess madatory use of sustainable biomass in permit procedures

RED III stipulates that sustainable biomass is only derived from countries ensuring that, i.a., installations producing biofuels, bioliquids and biomass fuels from forest biomass, issue a statement of assurance, underpinned by company-level internal processes, that the forest biomass is not sourced from the lands eliminated for agricultural and forest biomass production. However, the current provision verbally only addresses the countries in which forest biomass was harvested. At the same time, the directive does not directly limit the use of non-sustainable biomass resources. This leads to an imbalance depending on whether a state also aims to produce sustainable biomass or only plans to produce biofuels from biomass. In the latter case, no rules concerning the *mandatory* use of sustainable biomass apply to the producer. Additional incentives could be created for this, for example at the level of the permit procedure.

7. Addressing inconsistencies concerning exemptions for security of supply when applying the cascading principle and other sustainability principles

Concerning the application of the cascading principle, Member States are allowed to implement exemptions with regard to the prevailing national specificities and under 'duly justified circumstances'. This includes purposes of securing energy supply, so that an exceptional shortage of fossil LNG may enable Member States to support the production of bioLNG using woody biomass resources outside of the cascade. However, similar exemptions do not apply to sustainability criteria concerning the origin of biomass. Consequently, there is an imbalance

between different sustainability requirements for the use of woody biomass. Additional exemptions for reasons of securing energy supply could also be applied to sustainability criteria concerning the origin of biomass.

8. Integrated identification and assessment of bioLNG potentials

RED III obliges Member States on the one hand to identify their national potentials for the deployment of different renewable energy sources on a spatial level, but only with regard to the respective installations. On the other hand, Member States have to assess their national forest biomass resources within the NECP, but not on a spatial level and in a different process. Aligning and integrating both assessments with regard to potentials for bioLNG production may further facilitate the expansion of the technology and creates synergy effects for both assessments.

9. Acceleration of judicial review

Current measures to accelerate permit procedures only focus on the administrative levels, but do not include FRISTEN for the subsequent judicial review. Additional provisions with regard to the judicial review for renewable energy projects in general might further accelerate the regulatory processes and therefore contribute to the faster expansion of renewables. For example, this could either be achieved by implementing further time limits or by excluding suspensory effects of legal remedies if projects were approved by the competent authority in the first instance. Plants for producing bioLNG as well as other renewable energy plants contributing carbon-neutral electricity to the process would benefit from such fast-track procedures.

10. Raising public awareness and acceptance

Lastly, further efforts for raising public awareness and acceptance through information, education and participation can contribute to the acceleration of permit procedures, especially for innovative, less-known technologies. Public resistance to these projects will decline with acceptance of the technologies in question and awareness of the need for decarbonization. Both are seen as key factors in the acceptance of the projects in question and thus the rapid expansion of the respective renewable energy technologies.[69]

[69] See also Art 15d RED III, which emphasises the duty of the Member States to promote public acceptance of renewable energy projects by means of direct and indirect participation. On public support specifically as well as recommendations concerning improvements for biomethane permit procedures and best practice examples, also see Biomethane Industrial Partnership, Task Force 2: Report on Accelerating Biomethane Permitting, https://bip-europe.eu/wp-content/uploads/2023/10/BIP_Task-Force-2_Accelerating-biomethane-permitting_Oct2023.pdf. However, due to their publishing date, these recommendations did not yet take into account amendments of RED III to permitting procedures.

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