

POLICY UPDATE

JULY 2023

ICCT **POLICY UPDATES** SUMMARIZE REGULATORY AND OTHER DEVELOPMENTS RELATED TO CLEAN TRANSPORTATION WORLDWIDE.

© 2023 INTERNATIONAL COUNCIL ON CLEAN TRANSPORTATION

Provisions for transport fuels in the European Union's finalized "Fit for 55" package

Chelsea Baldino

In July 2021, the European Commission released the "Fit for 55" package, aimed at achieving the European Union's goal of reducing greenhouse gas (GHG) emissions by 55% in 2030 compared to 1990 levels. At that time, the ICCT published a policy update focusing on the proposals mandating alternative fuels in transport.¹ Since then, each legislative file went through the ordinary legislative procedure between the Council of Member States, European Parliament, and European Commission to amend the files and negotiate a compromise. This policy update provides an overview of the final revision of the recast Renewable Energy Directive (RED III), ReFuelEU Aviation regulation, and FuelEU Maritime regulation. The final provisions of the Alternative Fuels Infrastructure Regulation (AFIR) are described in a separate policy update.²

REVISION OF THE RENEWABLE ENERGY DIRECTIVE

OVERVIEW OF THE 2018 RED II

The recast of the Renewable Energy Directive (RED II) was passed by the European Parliament and Council in 2018.³ Because the RED II is a directive, it must be transposed by Member States into national legislation to take effect. The 2018 RED II includes a 14% target for blending renewable fuels in road and rail fuels in 2030, calculated on an energy basis. The contribution of food- and feed-based biofuels towards this target, as well as towards a 32% overall renewable energy target, is limited to either 7% of road and rail energy or up to 1 percentage point above the 2020 consumption level in a Member State, whichever is lower. Member States are permitted to further reduce this share. Intermediate crops, which can include

- 1 Stephanie Searle, "Alternative Transport Fuels Elements of the European Union's "Fit for 55" Package," (Washington, DC: ICCT, 2021), <https://theicct.org/publication/alternative-transport-fuels-elements-of-the-european-unions-fit-for-55-package/>.
- 2 Marie Rajon Bernard, "European Union Alternative Fuel Infrastructure Regulation," (Berlin: ICCT, 2023), <https://theicct.org/publication/afir-eu-april2023/>.
- 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, *Official Journal of the European Union*, L 328/82, December 11, 2018, https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=uriserv:OJ.L_.2018.328.01.0082.01.ENG&toc=OJ:L:2018:328:TOC.

Acknowledgments: The authors thank Nikita Pavlenko, Chris Malins, Stephanie Searle, Camilla Carraro, Bryan Comer, and Liudmila Osipova for their contributions.

www.theicct.org

communications@theicct.org

[twitter @theicct](https://twitter.com/theicct)

food and feed crops grown within or outside the EU and produced outside the main growing season, are not included in the definition of food and feed crops, and therefore do not count toward the food and feed cap. Additional details on the definition of intermediate crops in the RED II are available in a separate publication.⁴

High indirect land-use change (ILUC) feedstocks, which are defined in a 2019 delegated act, gradually phase out by 2030 from counting towards the transport target.⁵ A feedstock is designated as high ILUC if a significant fraction of the expanded production area of the relevant crop occurs on high carbon-stock land. In the delegated act, only palm oil is identified as a high ILUC feedstock. The Directive requires the Commission to review the criteria for possible amendment by September 1, 2023, which may influence which feedstocks are designated as high ILUC. The Commission is also required to provide a trajectory for the phaseout of these feedstocks. The delegated act also introduces general rules for how to certify feedstock as “low ILUC-risk,” which would not be subject to the general phaseout of support for high ILUC-risk feedstocks. An implementing act from 2022 clarifies the specific rules for determining whether a feedstock is low ILUC-risk.⁶

The RED II includes a 3.5% subtarget for advanced biofuels, which is also calculated on an energy basis. The feedstocks that count towards this target are found in Annex IX, part A, of the Directive and include many types of lignocellulosic material, animal manure, sewage sludge, and algae, as well as select other wastes and residues. Biofuels from these feedstocks may be counted twice in assessing compliance with Member State targets.

The contribution of feedstocks listed in Annex IX, part B may also be counted twice towards targets. These feedstocks, which are used cooking oil and category 1 and 2 animal fats, are limited to 1.7% of transport energy in each Member State, although Member States may request to set a higher cap depending on feedstock availability. In 2023, the European Commission published a draft amendment to add feedstocks to both parts of the Annex IX list. At the time of publication of this policy update, the final version has not been published.

The RED II also includes a 4x multiplier for renewable electricity used in vehicles towards the 14% transport energy target and a 1.2x multiplier for renewable fuels used in aviation and maritime, except for food- and feed-based biofuels.

In addition to biofuels and renewable electricity used in vehicles, renewable fuels of nonbiological origin (RFNBOs)—which include hydrogen and e-fuels produced via electrolysis using renewable electricity—may also be used to meet the 14% energy target. In 2023, the Commission published a delegated act with rules on how to ensure that the electricity used to produce RFNBOs is “fully renewable.”⁷ These rules are intended to ensure that the renewable electricity used in RFNBO production is in addition to the renewable electricity used to meet the overall renewable energy

4 Stephanie Searle, “Intermediate crops in the Renewable Energy Directive,” (Washington, DC: ICCT, 2021), <https://theicct.org/publication/intermediate-crops-in-the-renewable-energy-directive/>

5 Commission Delegated Regulation (EU) 2019/807 of 13 March 2019 supplementing Directive (EU) 2018/2001 of the European Parliament and 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, *Official Journal of the European Union*, L 133/1, March 13, 2019, http://data.europa.eu/eli/reg_del/2019/807/oj. More information on the Delegated Act can be found in Stephanie Searle, “The European Commission serves up real limits on palm biofuel,” *ICCT Staff blog*, March 20, 2019, <https://theicct.org/the-european-commission-serves-up-real-limits-on-palm-biofuel/>

6 Commission Implementing Regulation (EU) 2022/996 of 14 June 2022 on rules to verify sustainability and greenhouse gas emissions saving criteria and low indirect land-use change-risk criteria, *Official Journal of the European Union*, L 168/1, June 14, 2022, http://data.europa.eu/eli/reg_impl/2022/996/oj

7 Commission Delegated Regulation 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, February 10, 2023, https://energy.ec.europa.eu/publications/delegated-regulation-union-methodology-rfnbos_en

targets and is not diverted from more efficient uses.⁸ Producers of RFNBO are required to have power-purchase agreements with renewable power generators except when the grid-average electricity for the region is greater than 90% renewable electricity. Until December 31, 2029, RFNBO producers must demonstrate temporal correlation, meaning that the renewable electricity was produced within the same calendar month as the hydrogen; starting January 1, 2030, they must demonstrate that the renewable energy was produced within the same hour as the hydrogen. There is also a geographic correlation requirement: hydrogen must be produced in the same bidding zone or a nearby bidding zone as the renewable electricity installation. If the average GHG intensity of grid electricity in the local bidding zone is higher than 18 g CO₂e/MJ, then the producer must also demonstrate that the renewable energy production is “additional.” (The additionality criteria specify that a renewable electricity facility must not receive state aid and must not go into operation earlier than 36 months before RFNBO production begins). These additionality rules do not apply to RFNBO producers that begin operations before Jan. 1, 2028, and this exemption expires for those producers on Jan. 1, 2038.

Member States may also opt to count recycled carbon fuels (RCFs), which include fuels produced from industrial flue gases and waste plastics, towards their transport target. Another delegated act published in 2023 sets the GHG reduction requirement for RCFs at 70% below the fossil comparator, the same as for RFNBOs.⁹ It also provides detailed information on how producers should calculate GHG emissions from RFNBOs and RCFs. The methodology establishes the GHG accounting for CO₂ captured and incorporated into fuel, such as in the e-fuel production process. Here, fossil-sourced CO₂ captured from power stations in RCF and RFNBO production counts as zero emissions until 2036, and until 2041 for all other fossil industrial sources. After 2041 facilities will need to source CO₂ from direct air capture or biomass combustion, but the biomass may not be combusted strictly as a carbon source.

TRANSPORT ENERGY CHANGES IN THE RED III

The RED III raises the ambition of the overall renewable energy target for transportation, providing Member States with the option of converting the energy target to a GHG intensity target, and introduces a new combined target for RFNBOs and advanced biofuels.

The RED III replaces the 14% target for renewable energy in transport with either a 14.5% GHG intensity reduction target for transport for 2030 or a 29% renewable energy target; Member States may choose either target. The RED III expunges the 6% GHG target in 2020 in the Fuels Quality Directive and all its related articles, as well as in the corresponding Council Directive on related calculation methods and reporting requirements.¹⁰ The RED III also expands the scope of the target, previously calculated only as a percentage of road and rail fuels, to fuel supplied for international maritime transport and aviation. The amount of energy considered to be supplied to the maritime sector will not exceed 13% of the total consumption

8 When a RFNBO producer receives their renewable electricity via a direct connection between the renewable electricity production and the fuel production site, the RFNBO counts as additional, or “fully renewable.” See Chelsea Baldino and Stephanie Searle, “GO big or GO home with e-fuels and hydrogen” *ICCT Staff blog*, June 14, 2021, <https://theicct.org/go-big-or-go-home-with-e-fuels-and-hydrogen/>

9 Commission Delegated Regulation supplementing Directive (EU) 2018/2001 of the European Parliament and of the Council by Establishing a Minimum Threshold for Greenhouse Gas Emissions Savings of Recycled Carbon Fuels and by Specifying a Methodology for Assessing Greenhouse Gas Emissions Savings from Renewable Liquid and Gaseous Transport Fuels of Non-Biological Origin and from Recycled Carbon Fuels, February 10, 2023, https://energy.ec.europa.eu/publications/delegated-regulation-minimum-threshold-ghg-savings-recycled-carbon-fuels-and-annex_en

10 Council Directive (EU) 2015/652 of 20 April 2015 Laying Down Calculation Methods and Reporting Requirements Pursuant to Directive 98/70/EC of the European Parliament and of the Council Relating to the Quality of Petrol and Diesel Fuels, *Official Journal of the European Union*, L 107/26, April 25, 2015. <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32015L0652&from=EN>

of energy in the transport sector, except for Cyprus and Malta, where the amount of energy consumed in maritime transport shall not exceed 5%. The GHG reduction thresholds to determine eligibility for biofuels and RFNBOs remain unchanged.

The RED III introduces a combined 5.5% advanced biofuel and RFNBO target in 2030, calculated on an energy basis, with an interim target of 1% in 2025. There is a 2x multiplier for all feedstocks counting towards this target, however, so it is effectively a 2.75% energy target. The Directive states that biogas injected into the national transmission and distribution infrastructure may count towards the target.

The RED III includes several subtargets and incentives to promote the deployment of RFNBOs. Any renewable fuel used towards the FuelEU Maritime and ReFuelEU regulations may also be used towards the overall target and subtargets, where relevant. The Directive includes a 1% minimum share of RFNBOs in transport by 2030. Member States with maritime ports should aim to ensure that the share of RFNBOs in maritime energy is 1.2%. Further, the RED III introduced a 2x multiplier for RFNBOs towards the overall policy target. The RFNBOs that count towards the target include those used directly in transport, those used in biofuel production, and renewable hydrogen used in petroleum refining.¹¹ RFNBOs used in biofuel production may not contribute to a lower GHG intensity score for the biofuel if they are counted separately (i.e., the GHG intensity of the biofuel would be calculated as if those inputs were fossil-based). The RED III incorporates the delegated act rules on additionality, temporal correlation, and geographic correlation for RFNBO production, but requires the Commission to submit a report to the European Parliament and the Council assessing its impact on production costs, GHG savings, and the energy system by July 1, 2028. Depending on the report's conclusions, the Commission may adopt a delegated act modifying the methodology. The renewable electricity used for producing RFNBOs is counted towards the targets for the sector where the RFNBOs are consumed.¹²

The RED III maintains the 2x multiplier for all Annex IX feedstocks, the 4x multiplier for renewable electricity supplied to road vehicles, and the 1.5x multiplier for renewable electricity supplied to rail. It also maintains the 1.2x multiplier for aviation and maritime fuels but applies it only to advanced biofuels. The Directive adds a 1.5x multiplier for RFNBOs supplied to the maritime and aviation sectors. These multipliers apply when Member States assess compliance with the 5.5% target for advanced biofuels and RNFBOs, and to the transport sector target if Member States assess compliance based on the 29% renewable energy target rather than the 14.5% GHG emissions reduction target. Because of the multipliers, the 29% energy target could be met with significantly less than 29% actual renewable energy.

While the 4x multiplier for renewable electricity used in road transport does not apply when Member States demonstrate compliance using a GHG reduction target, the fossil fuel comparator for electric charging is set higher than the comparator value for liquid and gaseous fuels. The comparator of 94 g CO₂e/MJ for all other transport fuels represents the GHG intensity of the average liquid fossil fuel mix in the EU, while 183 g CO₂e/MJ represents the GHG intensity of fossil-derived electricity. Because renewable electricity used in vehicles is assumed to have zero GHG emissions, the GHG saving is calculated as 183 g CO₂e/MJ - 0 g CO₂e/MJ = 183 gCO₂e/MJ. This means that each energy unit of renewable electricity supplied to electric

¹¹ E.g., renewable hydrogen used for vegetable oil hydrotreating or renewable methanol used in transesterification of biodiesel.

¹² Member States may develop a cooperating agreement with another Member State so that all or part of the renewable energy used to produce RFNBOs is counted towards the overall renewable energy target in the Member State where the fuel was produced. The agreement needs to be submitted to the European Commission to prevent double counting of the electricity used in RFNBO production towards two Member States' targets.

vehicles would make a contribution towards the 14.5% GHG target about four times as large as would be made by a food-based biofuel achieving the minimum required 50% GHG savings (half of 94 g CO₂e/MJ, i.e., 47 g CO₂e/MJ).¹³ Thus, the relative contribution of electric vehicles to renewable electricity targets is comparable whether the Member State demonstrates RED III compliance through GHG intensity or through renewable energy.

The RED III requires Member States to establish a mechanism for public recharging stations to receive exchangeable credits for renewable electricity supplied to electric vehicles. Member States are also permitted to include private charging in this mechanism if they can prove the renewable electricity supplied to those points is provided solely to electric vehicles.

The RED III retains the cap on food- and feed-based fuels. The cap remains the lower of 7% or of the 2020 share of food and feed biofuels in transport energy in each Member State plus 1%. As in the RED II, Member States may reduce the transport target if they adopt a food- and feed-based biofuel cap lower than 7%. In the RED III, Member States shall consider food- and feed-based biofuels to have 50% GHG savings in making this adjustment and may reduce their applicable GHG target accordingly. Intermediate crops remain exempt from the food and feed cap.

The 1.7% cap on Annex IX, part B feedstocks, which include waste oil biofuels, also remains. The RED III newly empowers the Commission to adopt delegated acts to increase this cap, subject to a feedstock availability assessment. This provision may be particularly relevant if the Commission uses delegated acts to extend the set of feedstocks listed in Annex IX, part B.

As in the RED II, the Commission must review the criteria defined in the high-ILUC delegated act by September 2023. The RED III requires that this review assess whether to reduce the threshold of the maximum share of average annual expansion of the global production area in high carbon-stock land before a feedstock is classified as high ILUC-risk. The Commission is also required to review the data underpinning the delegated act and update the act when necessary.

Table 1 summarizes the major changes to transport fuels policy in the RED III, compared to the 2018 RED II. The deadline for Member State transposition is 18 months from entry into force of the Directive.

¹³ The 50% GHG savings threshold refers to biofuel installations predating 2015; later installations have a higher GHG savings.

Table 1. Summary of major changes to transport fuels policy in the Renewable Energy Directive

	2018 RED II	2023 RED III
Renewable energy in transport	14% energy target (out of road and rail fuels)	14.5% GHG intensity reduction target or 29% renewable energy target (out of all energy supplied to transport)
Advanced biofuels (Annex IX, part A)	3.5% (out of road and rail fuels, with multiplier)	5.5% of a combination of both fuel types, with a 1% RFNBO minimum (out of all energy supplied to transport)
Renewable fuels of nonbiological origin (RFNBOs)	No target	
Waste oils (Annex IX, part B)	1.7% cap (out of all energy supplied to road and rail)	1.7% cap (out of all energy supplied to transport)
Food- and feed-based biofuels	Cap at whichever is lower: 7% or 2020 consumption in each member state + 1% (out of road and rail fuels)	Cap at whichever is lower: 7% or 2020 consumption in each member state + 1% (out of all transport energy consumption)
Multipliers	<ul style="list-style-type: none"> • 2x for advanced biofuels and waste oils • 4x for renewable electricity used in vehicles • 1.5x for renewable electricity in rail • 1.2x for aviation and maritime fuels, except food- and feed-based biofuels 	Towards the overall 29% renewable energy target and all applicable subtargets for either an energy target or GHG target: <ul style="list-style-type: none"> • 2x for advanced biofuels, RFNBOs, and waste oils • 4x for renewable electricity in vehicles • 1.5x for renewable electricity in rail • 1.2x for advanced biofuels and 1.5x for RFNBOs in aviation and maritime sectors
Fossil comparator	<ul style="list-style-type: none"> • 94 gCO₂e/MJ for all transport energy 	<ul style="list-style-type: none"> • 183 g CO₂e/MJ for electricity used in vehicles • 94 g CO₂e/MJ for all other energy used in transport

REFUELEU AVIATION

The ReFuelEU Aviation regulation will provide EU-wide blending targets for renewable fuel in aviation, known as sustainable aviation fuel (SAF), from 2025 to 2050 according to the schedule presented in Table 2. The shares of SAF are calculated on a volume basis; this differs from the accounting in the RED II, which is on an energy basis.

Fewer types of biofuel feedstocks may be used to produce SAF compared to the RED III. All biofuels that meet the RED III’s sustainability criteria may be used to produce SAF, except food- and feed-based fuels as defined in the Directive, intermediate crops, palm fatty acid distillate and all other palm- and soy-derived materials, and soap stock and its derivatives. However, if any of these materials are included in Annex IX, part B, then they can count towards the SAF targets. As of July 2023, only the draft list of Annex IX feedstocks has been released; the draft list includes intermediate crops grown in areas where the production of food and feed crops is limited to one harvest, the intermediate crops do not create additional demand for land, and soil organic matter is maintained.¹⁴ Thus, these types of intermediate crops would count towards ReFuelEU’s SAF targets. Further, any biofuels produced from feedstocks other than those in Annex IX, parts A or B are capped at a maximum of 3% towards the SAF targets. Unlike the RED III, there is no cap on waste oils and fats in ReFuelEU.

The regulation also includes a separate subtarget for synthetic aviation fuels, which are defined as drop-in RFNBOs, also known as power-to-liquids, which comply with the RED III’s GHG savings thresholds and the sustainability criteria in Article 30. Hydrogen that qualifies as a RFNBO in the RED III, along with low-carbon aviation

¹⁴ European Commission, “Biofuels- updated list of sustainable biofuel feedstocks, Draft,” 2022, https://ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/13484-Biofuels-updated-list-of-sustainable-biofuel-feedstocks_en

fuels produced from nuclear energy, count towards the overall SAF target, and also very likely towards the synthetic aviation fuels subtarget, although the language on how it will be credited is unclear.

Table 2. Requirements for minimum volume shares of SAF and synthetic aviation fuels in ReFuelEU by year

Effective dates	Sustainable aviation fuel	Synthetic aviation fuels
January 1, 2025	2%	
January 1, 2030	6%	
January 1, 2030 – December 31, 2031		Average share of 1.2%, with a minimum share of 0.7% in each year
January 1, 2032 – to December 31, 2034		Average share of 2%, with minimum shares each year of 1.2% from January 1, 2032, until December 31, 2033, and 2% from January 1, 2034, to December 31, 2034
January 1, 2035	20%	5%
January 1, 2040	34%	10%
January 1, 2045	42%	15%
January 1, 2050	70%	35%

Since ReFuelEU is a regulation, not a directive, it is directly binding on obligated parties. Non-compliance will be met with penalties, to be applied by Member States.

Aviation fuel suppliers are required to supply SAF. They must report the amount and type of SAF supplied at each EU airport, as well as the content of naphthalenes, aromatics, and sulfur in each batch of fuel. There are also complementary obligations and reporting requirements for aircraft operators and the EU airport managing body. Aircraft operators are required to report their total fuel requirement per airport, their yearly tanked and nontanked fuel quantity, the quantity of SAF purchased at EU airports, and their total flights and flight hours covered by the regulation.¹⁵ To prevent “tankering,” aircraft operators are obligated to uplift at least 90% of their yearly fuel demand at EU airports. Tankering occurs when aircraft operators carry extra fuel from outside the EU to reduce the amount of SAF and synthetic aviation fuel they must purchase at EU airports. The EU airport managing body is required to facilitate aircraft operators’ access to SAF.

ReFuelEU only applies to commercial air transport flights. Compliance is mandatory for airports with passenger traffic higher than 800,000 passengers or freight traffic higher than 100,000 metric tons in the previous reporting period. The regulation does not apply to airports situated in outermost regions, as defined in the Treaty on the Functioning of the European Union. The fines for aviation fuel suppliers not meeting the overall SAF target must be at least two times the difference between the average yearly price of SAF and conventional aviation fuel per tonne, multiplied by the quantity of aviation fuel not complying with the SAF mandates. For failing to meet the synthetic fuel subtarget, the fine must be at least two times the difference between the yearly average price of synthetic fuel and conventional jet fuel. The fines for aircraft operators must be at least twice as large as the price of aviation fuel per unit fuel not tanked in the EU, although exceptions are allowed under unforeseeable circumstances. If aviation fuel suppliers fall short of their obligation for one reporting period, they are required make up the shortfall and are still subject to fines. Member States are encouraged to invest the revenue from fines in research and innovation for SAF.

¹⁵ An aircraft operator is an entity that operates at least 500 commercial passenger flights or 52 commercial all-cargo air transport flights in the previous reporting period.

The ReFuelEU regulation is expected to come into force on January 1, 2024, but the SAF targets do not apply until January 1, 2025. The policy includes a flexibility mechanism for 2025 to 2034, allowing fuel suppliers to report their SAF blending as a weighted average over all the aviation fuel supplied across EU airports for that reporting period. By July 1, 2024, the Commission must assess possible additions to this flexibility mechanism, such as a book-and-claim system.

FUELEU MARITIME

The FuelEU Maritime regulation introduces GHG intensity reduction requirements for the energy used on board by ships, based on a reference value of 91.16 g CO₂e/MJ. The GHG intensity of the energy must gradually decline from 2025 to 2050 according to the following schedule:

- » -2% in 2025
- » -6% in 2030
- » -14.5% in 2035
- » -31% in 2040
- » -62% in 2045
- » -80% in 2050

Like ReFuelEU, FuelEU Maritime will be implemented by the European Commission and be directly binding on ship operators. It will be applied at the fleet level, where individual ships in the same fleet may pool their compliance requirements. It applies to all energy used on ships at EU ports of call and on voyages between EU ports of call, to half of the energy used on voyages between an EU port and a third country, and on voyages between EU ports of call where one of the ports is in an “outermost region.” The proposed regulation applies to ships with a gross weight above 5,000 tonnes, with several exceptions. Any ships using zero-emission technologies are excluded from compliance. The Commission is required to define the types of technologies that qualify as zero-emission via delegated acts. Exempt from the regulation: passenger ships, ships travelling between outermost regions, warships, fishing ships, wooden ships of a primitive build, ships not propelled by mechanical means, or ships owned or operated by governments for noncommercial purposes.

Fuels that count towards FuelEU Maritime include biofuels, biogas, RFNBOs, and RCFs, as defined in the RED, and any fuels that have been certified according to EU legislation for the internal renewable and natural gases markets and in hydrogen markets, referred to as the gas Directive.¹⁶ All other fuels are considered to have the same emission factors as “the least favourable fossil fuel pathway for this type of fuel.” Annex II of the regulation provides GHG intensities of various fuels, broken out into well-to-tank and tank-to-wake emissions. Food- and feed-based fuels will be assigned the least favorable of all fossil pathways, excluding them from counting toward FuelEU Maritime. Certain fossil pathways, such as some LNG pathways, however, will be assigned emissions factors that are low enough for them to count toward FuelEU Maritime.

The proposed gas Directive includes low-carbon gas, which could include hydrogen produced from fossil fuels with carbon capture and storage. Low-carbon gases, including from fossil fuels, will qualify toward FuelEU Maritime as long as they remain in the final gas Directive and the Commission produces a methodology for

¹⁶ For more information on the Gas Directive, see Yuanrong Zhou and Chelsea Baldino, “Defining low-carbon gas and renewable gas in the European Union,” (Washington, DC: ICCT, 2022), <https://theicct.org/publication/defining-low-carbon-and-renewable-gas-oct22/>

calculating their GHG emissions intensity. GHG emission factors for biofuels, biogas, RFNBOs, and RCFs are calculated following the methodology in the RED II delegated act described in this paper and must also meet the RED III's sustainability criteria, including GHG emission reduction thresholds. The regulation also includes a reward factor based on the contribution of wind as a substitute source of energy. That reward factor, which ranges from 0.99 to 0.95, is then multiplied by the ship's fuel emissions intensity.

RFNBOs receive a 2x multiplier towards the GHG reduction target from 2025 through 2033. If in January 2031 the share of renewable fuels of nonbiological origin is lower than 1% of the energy used by a ship, excluding energy from onshore power, then starting in 2034 there is a 2% target for the ship to use any renewable fuels meeting the same GHG reduction requirement as for RFNBOs in the RED III. (The GHG reduction requirement for RFNBOs in RED III is 70%, excluding reductions produced from feedstocks in the RED II's Annex IX, part B.) If, however, the ship uses 2% RFNBOs by January 2033, then the mandate no longer applies. This mandate would include fuels produced from palm fatty acid distillate; soap stock and derivatives; intermediate crops falling outside the definition in Annex IX, part B—which could include food and feed crops produced in regions outside the EU with multiple growing seasons—and edible animal fats (category 3). We addressed sustainability issues with these fuels in a 2022 briefing paper.¹⁷ Further, the Commission must monitor the blending of RFNBOs and publish an assessment. If the Commission determines that there is “insufficient production capacity and availability to the maritime sector, uneven geographical distribution or a too high price” for RFNBOs, the target no longer applies.

Surpluses from overcompliance with the GHG intensity targets for one reporting period (such as a calendar year) may be banked for use in the next reporting period. Ship operators may incur a deficit of up to 2% of the GHG intensity limit in one year, but must make up the deficit plus 10% in the subsequent year. This cannot be done in two consecutive years. A noncompliance penalty is calculated according to the magnitude of the emissions deficit accrued over the year.

The FuelEU Maritime proposal introduces additional requirements for connecting to power when at berth. With some exceptions, in 2030, all container and passenger ships must use onshore power for all energy needs when at berth in a port covered by the AFIR. From 2035, this requirement extends to ports not covered by the AFIR should there be adequate onshore power. Between 2030 and 2035, Member States may require ships to connect to onshore power in ports not covered by the AFIR after consulting with stakeholders and notifying the Commission a year beforehand. The noncompliance penalty for this provision is 1.5 multiplied by the total electric power demand of the ship at berth and by the rounded-up hours spent at berth.

The FuelEU Maritime regulation will come into force following its publication in the Official Journal of the European Union and will apply starting January 1, 2025. The articles describing companies' monitoring plans go into force on August 31, 2024.

¹⁷ Chelsea Baldino and Jayant Mukhopadhyaya, “Considerations for the ReFuelEU aviation triologue,” (Berlin: ICCT, 2022), <https://theicct.org/publication/refueeu-definitions-trilogue-sep22/>.