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Report Highlights:

This report provides an overview of the biofuel use mandates in EU-27 member states, including temporary changes in response to the COVID-19 pandemic and Russia's invasion in Ukraine. It supplements the EU Biofuels Annual Report for 2023.

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Abbreviations and definitions used in this report

% Cal =	percent energy content
% Vol =	percent volume
% Biodiesel =	minimum percentage of biodiesel in total diesel use
% Bioethanol =	minimum percentage of bioethanol in total gasoline use
% Overall =	minimum percentage of biofuels in total fuel use
% GHG Emission Reduction =	Percentage of GHG reductions of total fuel use (fossil and renewable) compared to the hypothetical GHG emissions that would have occurred with the exclusive use of fossil fuels

All of the above refer to fuel use in the transport sector.

Biodiesel =	Fatty acid methyl ester produced from agricultural or waste feedstock (vegetable oils, animal fat, recycled cooking oils) used as transport fuel to substitute for petroleum diesel
Bioethanol =	Ethanol produced from agricultural feedstock used as transport fuel
Cat. 1 (2 and 3) =	Risk categories for animal-by-products as defined in EU Regulation (EC) 1069/2009 , with cat. 1 having the highest and cat. 3 the lowest risk.
Double counting =	Certain biofuels are counted twice against the mandates. This was introduced to support the use of certain biofuels and/or feedstocks. As a result of double counting, less physical volumes of a certain biofuel are needed to fill a mandate, which makes the respective biofuel more attractive than a comparable single counting biofuel. Definition and eligible feedstocks vary by member state (MS).
EC =	European Community or European Commission - depending on the context
ETBE =	Ethyl tert-butyl ether, an oxygenate gasoline additive containing 47% vol ethanol
EU =	European Union
FQD =	EU Fuel Quality Directive 98/70/EC amended by directives 2009/30/EC and (EU) 2015/1513
GHG =	Greenhouse gas
GJ =	Gigajoule = 1,000,000,000 Joule or 1 million KJ
Ktoe =	1000 MT of oil equivalent = 41,868 GJ = 11.63 GWh
MJ =	Megajoule
MS =	Member State(s) of the EU
MWh =	Mega Watt hours = 1,000 Kilo Watt hours (KWh)
N/A =	Not applicable
POME =	Palm Oil Mill Effluent
RED =	EU Renewable Energy Directive 2009/28/EC
RED II =	EU Renewable Energy Directive 2018/2001/EC
RES =	Renewable energy sources
SAF =	Sustainable aviation fuel
SBE =	Spent Bleached Earth
Tall oil =	A by-product of the wood manufacturing industry; qualifies as advanced biofuels feedstock
Tall-oil pitch =	The residue from the distillation of tall oil; qualifies as advanced biofuels feedstock
TME =	Tallow Methyl Ester, biodiesel made from animal fat

Toe = Tons of oil equivalent = 41,868 MJ = 11.63 MWh
UCO = Used cooking oil/ recycled vegetable oil
UCOME = UCO based methyl ester biodiesel
UER = Upstream emission reduction

Introduction:

The 2009 [EU Energy and Climate Change Package](#) set out a 10 percent minimum target for renewable energy consumed by the transport sector to be achieved by all EU member states (MS) in their countries in 2020. The [Renewable Energy Directive \(RED\)](#) laid down detailed provisions on the goals and conditions in the transport sector for the period 2010-2020. In 2018, the European Union adopted the [Renewable Energy Directive II \(REDII\)](#) covering the period 2021-2030. It set a new overall renewable energy target of 32 percent by 2030 and a 14 percent renewable energy target for the transport sector. In 2023, the European institutions agreed on a revision of REDII. The [text](#) still needs to be formally adopted. It is expected that it will enter into force in late 2023 or early 2024. The revised REDIII increases the 2030 target in the transport sector to either 29 percent renewable energy or a GHG intensity reduction of at least 14.5 percent.

Many MS have adopted minimum biofuel use mandates in order to achieve the RED and RED II goals. This report provides an overview of the current and future mandates from the various MS. For information on mandates referring to years prior than 2021 please check our report from 2022¹. Note that Cyprus, Luxemburg, and Malta are not included in this report. The tables represent the status quo as of May 20, 2023. If changes are being discussed but have not yet been adopted, they are mentioned in the text below the tables.

EU Renewable Energy Targets

RED II sets an overall binding renewable energy target of at least 32 percent by 2030 with a 14 percent target for the transport sector, with a clause for a possible upwards revision by 2023. Within the 14 percent transport sector target, food-based biofuels are capped at MS 2020 levels up to one percent higher, but with a maximum cap of seven percent for each MS. If the cap on first generation biofuels in a MS is less than seven percent, the country may reduce the transport target by the same amount (for example, a country with a food and feed crop cap of six percent could set a transport target at 13 percent). Member states can also set a lower limit for conventional biofuels than prescribed in RED II. For advanced biofuels, RED II introduces two different sets of targets for feedstock listed in Part A of Annex IX and feedstock listed in Part B. Feedstock listed in Part A must be supplied at a minimum of 0.2 percent of transport energy in 2022, one percent in 2025, and at least 3.5 percent by 2030. Biofuels produced from feedstock listed in Part B will be capped at 1.7 percent in 2030. Advanced biofuels will be double counted towards both the 3.5 percent target and towards the 14 percent target.

¹ [Biofuel Mandates in the EU by Member State - 2022 Berlin European Union E42022-0044](#)

**Table 1. Advanced Biofuel Sources,
Part A and Part B of Annex IX in RED II**

Part A	Part B
<ul style="list-style-type: none"> • Algae if cultivated on land in ponds or photobioreactors • Biomass fraction of mixed municipal waste • Biowaste from private households subject to separate collection • Biomass fraction of industrial waste not fit for use in the food or feed chain • Straw • Animal manure and sewage sludge • Palm oil mill effluent and empty palm fruit bunches • Crude glycerin • Bagasse • Grape marcs and wine lees • Nut shells • Husks • Cobs cleaned of kernels of corn • Biomass fraction of wastes and residues from forestry and forest-based industries • Other non-food cellulosic material • Other ligno-cellulosic material except saw logs and veneer logs 	<ul style="list-style-type: none"> • Used cooking oil (UCO) • Some categories of animal fats

**Table 2. Advanced Biofuel Sources,
Part A and Part B of Annex IX, Mandates and Cap**

	Part A Mandates (% cal)	Part B Cap (% cal)
2022	0.2	
2025	1	
2030	3.5	1.7

In the revised REDIII, advanced biofuels from the feedstock listed in Annex IX and renewable fuels of non-biological origin can still be double counted towards the targets.

EU-wide Greenhouse Gas (GHG) Emission Reductions

The [Renewable Energy Directive \(RED\)](#) stipulated that biofuels can only be counted against EU and/or member state targets if they fulfill the following minimum greenhouse gas (GHG) reduction requirements:

	Table 3. RED Minimum % GHG Emission Reductions of Each Biofuel Compared to the Respective Fossil Fuel
2009-2017	35%
2018 and onwards	50% for biofuels produced in operations that started production on or before Oct 5, 2015. 60% for biofuels produced in operations that started production after Oct 5, 2015.

Source: Art. 7 b of *EU Directive 98/70/EC* as revised by *Directive (EU) 2015/1513*
<http://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1502451943595&uri=CELEX:01998L0070-20151005>

The *Fuel Quality Directive (FQD)* ([Directive 2009/30/EC](#)) complemented the RED and mirrored some of the RED's content such as the sustainability criteria. A key requirement in article 7a of the FQD is that all **fuel suppliers must meet a six percent reduction in GHG emissions by 2020 across all fuel categories supplied to the market**. This is designed to be consistent with the 10 percent minimum use target for biofuels and shift demand towards biofuels with higher GHG savings. In addition, the FQD limits ethanol blends to 10 percent or less when ethanol is used as an oxygenate, and places limits on palm oil and soy oil content of biodiesel. The Commission did not increase the GHG reduction target in the FQD for the time beyond 2020. Instead, the Commission addressed the issue of the decarbonization of transport fuels after 2020 in RED II.

RED II introduced new GHG emission criteria that biofuels used in transport must comply with to be counted towards the overall 14 percent target. The European Commission is allowed to revise and update the default values of GHG emissions when technological developments make it necessary. Economic operators have the option to either use default GHG intensity values provided in RED II or to calculate actual values for their pathway.

Table 4. Greenhouse gas savings thresholds in RED II			
Plants started/start operations	Transport biofuels	Transport renewable fuels of non-biological origin	Electricity, heating and cooling
Before October 2015	50%	-	-
After October 2015	60%	-	-
After January 2021	65%	70%	70%
After January 2026	65%	70%	80%

Mandate Changes in Response to Crisis

Russia's invasion in Ukraine in February 2022 resulted in a steep increase in energy and agricultural commodity prices, which in turn increased inflation. As a response and to alleviate inflationary pressure for their consumers and compliance pressure on industry some countries decided to temporarily reduce biofuel mandates or the penalties for not fulfilling the mandates for their territory:

- **Croatia** removed some of the penalties for not achieving the blending thresholds for fuel distributors. This measure was valid from March through December 31, 2022. From January through June 2023, the penalties were reinstated but at a very low level.
- **Czech Republic** made blending mandates voluntary as of July 1, 2022. This measure was part of a legislative package adopted by the Czech government in May 2022. However, the obligation for suppliers to reduce the GHG emissions remains in place.
- **Finland** temporarily reduced its 2022 and 2023 mandates to alleviate high fuel prices for consumers.
- **Latvia** suspended mandatory blending of biofuels for the period of July 1, 2022, through December 31, 2023. During this period, biofuel blending in gasoline and diesel is voluntary.
- **Poland** set the minimum level of fulfilment of the National Indicative Target (NIT) in 2023, which entitles the operators to use the substitution fee mechanism, at 80 percent (maintaining the reduced level as in 2020-2022). The new legislation also extended the possibility of using the 0.82 reduction factor for another year, lowering the mandatory blending for diesel fuel to 5.2 percent (the limit set at 6.2 percent level, but reduced in 2020 to 5.0 percent), and raising to 0.9 percent the limit on the possibility of using HDRD in meeting the NIT. The amendment also raised the limit on the use of biocomponents produced from certain raw materials such as algae, bio-waste, biodegradable municipal waste, straw, biomass fractions from forest management, among others to 0.5 percent (from 0.45 percent in 2020-22).
- **Sweden** froze annual increases to the GHG emissions reduction targets in 2023.

Additional measures that are being discussed but not yet confirmed include:

- **Germany's** Ministry of the Environment has put forward a proposal to phase-out crop-based biofuels and increase multiple counting options for non-biomass renewable fuels to alleviate pressure on global food security. At the time of writing no decision has been made.
- **Sweden** is discussing lowering the GHG reduction targets for 2024-2026.

Mandates by Member State:

To provide context, current, expired, and future mandates are listed below, by member state in alphabetical order. Mandates based on energy content are expressed in % cal, volume-based mandates in % vol, and GHG saving mandates in % GHG emission reduction (compared to the hypothetical GHG emissions that would have occurred with the exclusive use of fossil fuels). **For easy reference, mandates applicable in 2023 are in bold.**

Austria

	Overall Percentage (energy content, % cal)	Biodiesel (% cal)	Bioethanol (% cal)	Advanced Biofuels (% cal)	GHG Emission Reduction (%) ¹⁾	Cap on crop-based biofuel (% cal)	Multiple Counting
2021	5.75	6.3	3.4	0.5 ²⁾	6	7³⁾	No
2022	5.75			0.5 ²⁾	6		
2023	None			0.2	6		
2024				0.2	7		
2025				1	7.5		
2026				1	8		
2027				1	9		
2028				1	10		
2029				1	11		
2030				3.5	13		

Source: FAS Vienna based on [Austrian Fuels Order 2012](#), (with its 2014, 2017, 2018, 2020, and 2022 amendments)

- 1) To reach the GHG reduction target the following may be taken into account:
 - Emission credits from upstream emission reduction (UER) projects (in 2023 only and up to a maximum of 1 percent).
 - electric power from renewable energy sources used for electrically powered motor vehicles may also be taken into account (multiple counting x4 for renewable electricity in road transport).
- 2) The substitution target can be reduced upon request if advanced biofuels are not available in sufficient amounts.
- 3) Palm oil-based biofuels are excluded since July 1, 2021.

Penalties

Failing to meet the mandates is sanctioned with the following penalties:

Mandate	Penalty
Energetic	43 Euro per GJ under supplied
GHG reduction 2023	600 Euro per MT CO ₂ eq for the first 5 percent and 15 Euro per MT CO ₂ eq for the last percent of unmet GHG reduction target
GHG reduction 2024 and onwards	600 Euro per MT CO ₂ eq of unmet GHG reduction target

In addition to penalties, there is a tax incentive for biofuels. For gasoline with a minimum content of biogenic substances of 46 liters per 1,000 liters, the reduced mineral oil tax is EUR 482 per 1,000 liters (regular tax rate = EUR 515). For diesel with a minimum content of biogenic substances of 66 liters per 1,000 liters, the reduced mineral oil tax is EUR 397 per 1,000 liters (regular tax rate = EUR 425). Pure biofuels in transportation are fully exempt from the mineral oil tax.

Belgium

	Overall Percentage (% cal)	Biodiesel (% cal)	Bioethanol (% cal)	Double Counting
2021	9.55	6.5	6.5	Max 0.6 %
2022	10.2	6.5	6.5	Max 0.95 %
Since January 1, 2023	10.5	5.7	5.7	Max 0.95%

Source: FAS USEU based on [Law of July 7, 2013](#); [Law of July 21, 2017](#); Law of May 4, 2018; Law of December 27, 2021

Since the increase of the bioethanol mandate at the beginning of 2017, the majority of Belgian gasoline is E10, with the exception of a remnant market for bioethanol-free gasoline for older cars and small engines like lawnmowers.

Penalties

Failing to meet the mandates is sanctioned with the following penalties:

Mandate	Penalty
Energy	€1400 per 34 GJ undersupplied.

Source: [ePure](#)

Bulgaria

Biodiesel (% vol)		Bioethanol (% vol)		Advanced Biofuels (% cal)	Cap on crop- based biofuels (% vol)	Multiple Counting
Since June 1, 2012	6 ¹⁾	March 1, 2019	9	-	-	No
		April 1, 2019	9	0.05	7	

Source: FAS Sofia

1) Since April 1, 2019, the mandate is kept at six percent biodiesel, however, at least one percent of the volume of the biodiesel should be advanced biodiesel.

In 2018, (Official Gazette 91/November 2, 2018) Bulgaria's Parliament amended the nation's Renewable Energy [Law](#) to transpose Directive 2015/1513/EU into national law. The legislation introduced sustainability criteria (traceability) for advanced biofuels. Adopted changes are in Article 47 of the *Bulgarian Renewable Energy Law* and enforced since April 1, 2019. The institution supervising the quality of fuel, biofuel mandates, and advanced biofuels on the market is the [Agency](#) for Metrological and Technical Surveillance under the Ministry of Economy. Per the current legislation, the maximum blend with conventional fuel cannot exceed seven percent for biodiesel, and ten percent for bioethanol, to be in line with the EU fuels' quality regulations FQD.

Transposition of RED II into the national law was scheduled for June 2021. However, due to the political stalemate with two Parliamentary elections in 2022 and one in April 2023, the work on the new law was delayed. The proposal includes an increase of the target to 14 percent renewable energy in transportation by 2030 (compared to the current 10 percent target), to be achieved by the incorporation of more advanced biofuels. This includes second generation bioethanol, new production capacities, and more electricity in the renewable energy mix. However, due to the current challenging energy situation and industry's demand for an abolishment and/or temporary cancellation of biofuel mandates, these plans may change. The transposition of RED II into the national law is expected to be debated later this year with the goal to have it finalized before the end of 2023.

Croatia

	Overall Percentage (% cal)	Biodiesel (% cal)	Bioethanol (% cal)	Double Counting
2020-2029^{1),2)}	8.81	7.49	1.00	Advanced and waste-based biofuels
2030 ^{3),4)}	14 ⁵⁾			

Source: FAS Zagreb based on

- 1) *National Action Plan for Renewable Energy Sources* to 2020, https://mzoe.gov.hr/UserDocsImages/UPRAVA%20ZA%20ENERGETIKU/Strategije,%20planovi%20i%20programi/National_Action_Plan%20for%20Renewable%20Energy%20Sources%20to%202020.pdf
- 2) *Act on Biofuels for Transport* (Official Gazette 65/09, 145/10, 26/11, 144/12, 14/14, 94/18, 52/21), <https://www.zakon.hr/z/189/Zakon-o-biogorivima-za-prijevoz>
- 3) *The Integrated National Energy and Climate Plan* (NECP) for the Republic of Croatia (2021-2030), https://energy.ec.europa.eu/documents_en?f%5B0%5D=document_title%3ACroatia
- 4) European Commission, Assessment of the final national energy and climate plan of Croatia 2021, [Documents \(europa.eu\)](https://energy.ec.europa.eu/documents_en?f%5B0%5D=document_title%3ACroatia)
- 5) The 13.2 percent according to the NECP (2021-2030) was amended to 14 percent.

The new *Law on Amendments to the Act on Biofuels for Transport* entered into force on May 22, 2021. According to the *Integrated National Energy and Climate Plan for the Republic of Croatia* (2021-2030) (NECP), Croatia aims to have a share of renewable energy sources (RES) in gross final energy consumption at 36.4 percent and the share of RES in final energy consumption in transport at 13.2 percent (later amended to 14 percent) by 2030. Due to high inflation caused by COVID-19 and Russia's invasion in Ukraine in March 2022 the Croatian Government removed some of the penalties for not achieving the blending thresholds for fuel distributors. This measure was valid until the end of 2022. From January 1, 2023, penalties are defined by the *Amendment to the Government Decree on Penalties for the Environment* for not Placing Biofuels on the Market and for not Reducing Greenhouse Gas Emissions “(https://narodne-novine.nn.hr/clanci/sluzbeni/2022_12_156_2528.html). This Government Decree will be valid until June 30, 2023.

Penalties (January 1 – June 30, 2023)

Failing to meet the mandates is sanctioned with the following penalties:

Mandate	Penalty
Energy % from Biofuels (0%-3%, 3.01%-5%, >5%)	0.001327 EUR/MJ under supplied
GHG reduction (0%-2%, 2.01%-6%)	0.001327 EUR/kgCO ₂ under allocated

Czech Republic

RED II obligations for 2021 - 2030 were transposed into national law with the *Act on Supported Energy Sources and Amendments to Certain Other Acts no. 382 Coll.*, that entered into force on September 15, 2021. The *Act on Air Protection no. 201/2012*, as later amended (by 284/2021, 282/2021, 261/2021) sets the following renewable energy mandates in transport:

	Renewable energy in transport (% cal)	Advanced biofuels biomethane bioLPG (% cal)	Minimum GHG emission reduction (%)	Biodiesel (% vol)	Bioethanol (% vol)	Double counting ¹⁾
2021	-	-	6	-	-	Yes applies only to shares of advanced biofuels raw material IX.A, to biofuels raw material IX.B and to advanced biomethane and bioLPG
2022		0.22				
- 2024						
2025						
2030	9.5	1.07				

Source: FAS Prague

¹⁾ According to the Act on Supported Energy Sources and Amendments to Certain Other Acts No. 382 Coll., with effect from September 15, 2021.

The individual blending mandates were suspended as of July 2022. This legislation was part of a legislation package that was adopted by the Czech government in May 2022 to address the soaring prices of motor fuels. The obligation to reduce GHG emissions remains in place.

Penalties

Failing to meet the mandates is sanctioned with the following penalties:

Mandate	Year	Penalty
GHG reduction	Since 2009	10 CZK per kg CO ₂ eq reduction not achieved
Advanced biofuel	Since 2022	2 CZK per MJ that was not supplied
Renewable energy	2030 and onwards	1 CZK per MJ that was not supplied

Denmark

	Overall Percentage (% cal)	GHG emission reduction (%)	Cap on crop-based biofuels (% vol)	Advanced Biofuels ²⁾ (Annex IX-A) (% cal)	Multiple Counting
2021	7.6			0.9	
2022-2024		3.4	Biofuels based on palm oil and soy phased out by 2022¹⁾	0.2	x 2 for advanced biofuels; x 4 for renewable electricity in road, x 1.5 in train; x 1.2 for aviation and maritime fuels
2025-2027		5.2	All High-ILUC-risk biofuels phased out by 2025	1	
2028-2029		6		1	
2030		7		3.5	

Source: FAS The Hague based on ePure

1) Unless certified low-ILUC-risk.

2) The use of biofuels produced from Annex IX-B feedstock is capped at 1.7 percent.

Crop-based biofuels:

All high-ILUC-risk biofuels should be phased out no later than 2025. Biofuels based on palm oil (and its by-products, incl. PFAD) and soy are excluded from 2022, unless certified low-ILUC-risk.

Annex IX biofuels:

With the introduction of the CO₂ reduction requirement from 2022, there is no longer an obligation on fuel suppliers to ensure a minimum share of Annex IX-A biofuels. Denmark must still meet the minimum RED II mandates for Annex IX-A biofuels. The use of biofuels produced from Annex IX-B feedstock is capped at 1.7 percent.

Penalties: Fuel suppliers failing to fulfil the GHG reduction quotas may be fined and imposed criminal liability.

Estonia

	Overall Percentage (% cal)	Advanced Biofuels (% cal)	Cap on crop-based biofuel (% cal)	Double Counting
2022	7.5	0.5	4.5	Yes
2023		0.5	2.5	
2024 - 2027		0.5	0.5	
2028	8.5			

Source: FAS Warsaw based on the Estonian *Liquid Fuel Act* passed on January 29, 2003, last amended on February 15, 2023

Penalties

Failure to comply with the obligation concerning the share of biofuel released for consumption can be fined with:

Committed by	Penalty
Natural person	Up to 300 fine units
Legal entity	Up to 10,000,000 Euros

Source: § 33 of [Liquid Fuel Act of 2003 as amended in February 2023](#)

Finland

	Overall Percentage (% cal)	Advanced biofuel	Cap on crop-based biofuel¹⁾ (% cal)	Multiple Counting
2022	12	2	2.6 High ILUC: 0	No
2023	13.5	2		
2024	28	4		
2025	29	4		
2026	29	6		
2027	30	6		
2028	31	8		
2029	32	9		
from 2030	34	10		

Source: FAS The Hague based on ePure

1) Applicable since July 1, 2021. Biofuels produced from Annex IX- B feedstock are not capped.

Penalties

Failing to meet the mandates is sanctioned with the following penalties:

Mandate	Penalty
Biofuel	€0.04 per MJ (\approx €1,675/toe) of missing biofuel
Advanced biofuels	€0.03/MJ (\approx 1,260/toe) of missing advanced biofuel

Source: ePure

In April 2022, the Finnish government decided to temporarily reduce its 2022 overall obligations from 19.5 percent to 12 percent.

France

	Bioethanol (% cal)		Biodiesel (% cal)		Double Counting
		Advanced (% cal)		Advanced (% cal)	
2021-2022	8.6	-	8	-	Yes¹⁾
2023-2027		1.2		0.4	
2028 and onwards		3.8		2.8	

Source: FAS Paris

1) Double counting for cellulosic biofuels and waste biofuels produced from the feedstocks listed in Annex IX of Directive 2009/28/EC except tall oil and tall oil pitch.

Cap on certain feedstocks

From 2019, the share of energy that can be taken into account is limited to a maximum of:

- 7 percent for conventional biofuels including biofuels produced from palm oil fatty acid distillates
- 0.9 percent for used cooking oil and animal fats
- 0.6 percent for tall oil and tall oil pitch
- 0.2 percent for sugar plant residues and starch residues extracted from starch-rich plants (0.4 percent from 2020)
- Palm oil is excluded since January 1, 2020
- Soybean oil is excluded since January 1, 2022

Some eligible products, obtained from raw materials derived from biomass not intended for human consumption, can be taken into account with twice their energy value for the determination of the renewable energy share in a scheme called “double counting”. Double counting promotes the emergence of advanced biofuels, whose incorporation mandates will increase from 2023 onward.

Article 43 of the Energy Transition Law for Green Growth states that priority should be given to the development of advanced biofuels while preserving investments made in conventional biofuel production.

Penalties

Article 32 of the 2005 Finance Act introduced a tax (renamed *Taxe Incitative relative à l'Incorporation de Biocarburants*, biofuel incorporation incentive tax, in the 2019 Finance Act) penalizing operators who release a proportion of biofuels below the incorporation targets. The operator is taxed on the difference between the national target percentage of renewable energy incorporation and the proportion of renewable energy contained in the products.

Germany

	Overall Percentage¹⁾ (% cal)	Advanced Biofuels³⁾ (% cal)	GHG Emission Reduction¹⁾ (%)	Cap on crop-based biofuel³⁾ (% cal)	Double Counting²⁾
2021		0.1 ⁴⁾	6.0	6.5	No

Sources: FAS Berlin based on

1) *Federal Act on Protection against Air Pollution* (Bundes-Immissionsschutzgesetz) in the version of 2013

2) Double counting expired at the end of 2014 with the transition to a GHG reduction mandate. Since then, HVO and UCO-based biodiesel enjoy competitive advantages based only on their higher GHG reduction compared to first generation biofuels

3) *38th Implementation Ordinance on the Federal Act on Protection against Air Pollution*

4) Companies that put on the market 10 PJ or less of biofuels in the previous year are exempted

Germany transposed the RED II directive into national law with the *Law for the Further Development of the Greenhouse Gas Reduction Mandate* of September 24, 2021. This law amends the existing mandates and feedstock caps, introduces additional mandates for advanced biofuels and sustainable aviation fuel, and allows for additional compliance options.

	GHG Emission Reduction¹⁾ (%)	Advanced Biofuels²⁾ (% cal)	Cap on crop-based biofuel²⁾ (% cal)	Cap on UCO- and animal fat-based biofuels²⁾ (% cal)	Cap on feedstocks with high ILUC risk^{2), 5)} (% cal)	Multiple counting	Sustainable Aviation Fuel^{1) 6)} % Cal
2022	7	0.2 ³⁾	4.4	1.9	0.9	See table below	-
2023	8	0.3⁴⁾			0		
2024	9.25	0.4 ⁴⁾					
2025	10.5	0.7					
2026	12	1					
2027	14.5	1					
2028	17.5	1.7					
2029	21	1.7					
2030	25	2.6			2		

Sources: FAS Berlin based on [Federal Act on Protection against Air Pollution](#) and [38th Implementation Ordinance on the Federal Act on Protection against Air Pollution](#) (both in German language)

1) Federal Act on Protection against Air Pollution

Until 2026, emission credits from upstream emission reduction (UER) projects may be taken into account to comply with the GHG reduction mandate.

2) 38th Implementation Ordinance on the Federal Act on Protection against Air Pollution

3) Companies that put on the market 10 PJ or less of biofuels in the previous year are exempted

4) Companies that put on the market 2 PJ or less of biofuels in the previous year are exempted

5) Effectively, this means that starting in 2023, biofuels based on palm oil feedstock no longer count against the mandates.

6) Only non-biomass-derived sustainable aviation fuel (SAF) is eligible for counting against this mandate

Multiple counting

Compliance Option	Conditions	Factor
Advanced biofuels ¹⁾	Volumes that exceed the mandate	2
Hydrogen and PtX fuels ²⁾	If not derived from biomass	2
Electricity	For road e-vehicles	3

Sources: FAS Berlin based on

1) *38th Implementation Ordinance on the Federal Act on Protection against Air Pollution*

2) *Federal Act on Protection against Air Pollution*

Penalties

Failing to meet the mandates is sanctioned with the following penalties:

Mandate	Year	Penalty
Energetic	2009-2014:	Biodiesel: 19 Euro per GJ under allocated Bioethanol: 43 Euro per GJ under allocated
	2015 – 2021	0.47 Euro per kg CO ₂ eq under allocated reduction
GHG reduction	Since 2022	0.60 Euro per kg CO ₂ eq under allocated reduction
	Since 2022	70 Euro per GJ under allocated
SAF	Since 2022	70 Euro per GJ under allocated

Source: FAS Berlin based on *Federal Act on Protection against Air Pollution*

Proposed changes

In May 2022, in response to Russia's invasion in Ukraine and in an effort to reduce the share of crops that are used to produce biofuels the German Federal Ministry of the Environment and Consumer Protection (BMUV) issued a working paper that proposed to:

- tighten the cap on crop-based biofuels and phase out agricultural feedstocks altogether by 2030;
- increase the multiplication factors for other compliance options;
- postpone the phase out of UER measures from the end of 2026 to 2028.

In January 2023, the informal proposal was put forward as draft law that is still in the legislative process. However, it remains to be seen whether the law will be adopted since 1) the prices on the commodity markets have dropped considerably and 2) in the near term it will be difficult to reach Germany's climate goals without biofuels.

Greece

	Overall Percentage (% cal)	Biodiesel (% cal)	Bioethanol (% cal)	Multiple Counting
Since 2020	10.0	7.0	3.3	No

Source: FAS Rome

In 2012, decision 4062 (FEK 70/A/30.3.2012) harmonized the Greek legislation with European Commission Directive 2009/28/EC. As a result, the increased mandate of 10 percent in 2020 can be met either by domestic production or imports. Note: The previous lower mandate was only allowed to be filled through domestic production.

[Law 3054/2002](#) and its amendments mandates that producers and distributors of petrol and diesel must blend their fuels with a certain amount ("quota") of biofuels. The quota is specified in the "distribution scheme," reviewed every year, and set at seven percent for 2019 and 2020. This translates into 133 million liters for 2020 and 110 million liters for 2021.

Hungary

	Renewable energy in transport (% cal)	Biodiesel (% cal)	Bioethanol (% cal)	Advanced Biofuels (% cal)	Double counting
2021	6.2	8.2	6.1	-	Biofuels derived from feedstock listed in Annex 2 of the Government Decree No. 279/2017 (in Hungarian)
2022-2023		8.4	6.1	0.2	Biofuels derived from feedstock listed in Annex 2 of the Government Decree No. 821/2021 (in Hungarian)

Source: FAS Budapest

Hungary has set the target of a minimum 14 percent share of renewable energy in transport by 2030. This obligation entered into force with [CXVII/2010 Act](#) (in Hungarian) on promoting the use of renewable energy and the reduction of GHG emissions of energy used in transport. To meet this requirement, Hungary increased the share of crop-based biofuels to roughly seven percent, and the share of advanced biofuels produced from waste and biogas will grow to 3.5 percent of energy consumption in

transport according to the [National Energy and Climate Plan](#). The remaining share of the target will be achieved through an increase of electricity use in transport as GHG emissions should be reduced by at least 40 percent by 2030, compared to 1990. This means, gross GHG emissions may not exceed 56.19 million MT CO₂ equivalent in 2030.

Penalties

Penalties imposed on fuel distributors for failing to meet the six percent GHG emissions reduction mandate stipulated in [CXVII/2010 Act](#) (in Hungarian).

Year	Penalty/MT CO ₂ equivalent under allocated reduction	
Since 2020	If GHG reduction in energy units is 0-4%	If GHG reduction in energy units is 4-6%
	HUF 100,000	HUF 10,000

Ireland

	Overall Percentage (% vol)	Annex IX biofuels (% cal)	Multiple Counting
2022	15		x2 for Annex IX biofuels; x4 for renewable electricity in road, x1.5 in train; x1.2 for aviation and maritime fuels
2023	17	0.3	
2024	21	0.3	
2025	25	1	
2026	29	1	
2027	34	1	
2028	39	1	
2029	44	1	
2030	49	3.5	

Source: FAS London and ePure

Bioethanol

Ireland's *Climate Action Plan* sets out an ambition to reach a blend of E10 by 2025. Ireland began its E10 roll-out in April 2023 as one of several measures introduced to achieve a government target of 51 percent reduction in transport emissions by 2030.

Ireland's [Consultation Draft Renewable Transport Fuel Policy](#) of March 2023 includes a discussion on the future use of a minimum percentage of ethanol in gasoline as a policy instrument to assist it in reaching climate targets.

Advanced Biofuels

To meet EU targets, Ireland is proposing to increase the advanced biofuel obligation to one percent in 2024, and 1.5 percent in 2025, subject to consultation on draft regulations.

Penalties

Failing to meet the mandates is sanctioned with the following penalties:

Mandate	Penalty
Energetic	Overall Biofuel mandate: Buy-out price 0.05 Euro/MJ Advanced Biofuel mandate: Buy-out price 0.08 Euro/MJ + Tax incentive: The Mineral Oil Tax (MOT) applies to fuels and is composed of the fuel excise and a carbon tax (the MOTCC). The latter do not apply to biofuels

Source: ePure

Italy

Year	Overall Percentage, incl. Advanced Biofuels (% cal)	Advanced Biofuels (% cal)	
		% of advanced biomethane	% of other advanced biofuels
2021	10	2.0	0.5
2022	10	2.5	0.6

Source: FAS Rome

Year	Overall (%)	Advanced Biofuels (%)	Bioethanol (%)	Advanced Biomethane (%)
2023	10	3.4	0.5	2.3
2024	10.8	4.2	1	2.9
2025	11.7	4.9	3	3.5
2026	12.6	5.5	3.4	3.9
2027	13.4	6.1	3.8	4.3
2028	14.3	6.7	4.2	4.8
2029	15.2	7.4	4.6	5.2
2030	16	8	5	5.7

Source: FAS Rome, based on a decree dated March 16, 2023, issued by Italy's Ministry of Environment and Energy Security

Penalties

As of 2020, fuels suppliers not complying with at least 95 percent of the renewable mandates have to pay a penalty of €750 per missing certificate. A certificate is equivalent to 10 Gcal \approx 1 toe or 5 Gcal \approx 0.5 toe for advanced biofuels. The penalty for advanced biofuels can be reduced if insufficient market availability is demonstrated.

Latvia

	GHG Emission Reduction ¹⁾ (%)	Cap on crop-based biofuel (% cal)
Since 2021	6	7

Source: FAS Warsaw based on [Regulation 597](#) of 2018 on calculating and reporting the amount of GHG emissions from the life cycle of transport energy and its reduction, as amended in 2019

1) To comply with the mandate fuel suppliers may also use:

- alternative fuels other than biofuels;
- electricity used for charging electric vehicles for final consumption in transport;
- implementing upstream emission reductions or purchasing upstream emission reductions implemented by another fuel supplier or economic operator.

In accordance with *Cabinet Regulation No. 332* of 2000 on the conformity assessment of petrol and diesel fuel, last amended in 2020, in Latvia a fuel supplier may only sell diesel with a biodiesel content of 6.5 percent by volume of the total amount of end product and petrol with a 5 percent (for 98-octane gasoline) or 9.5 percent (95-octane gasoline) of bioethanol content by volume of the total amount of petrol.

The requirement on the mandatory admixture of 6.5 percent of biodiesel does not apply to Class 0, 1, 2, 3, and 4 diesel for use in arctic or severe winter conditions during the time period from November 1 to April 1.

With the *Regulation of the Cabinet of Ministers No. 350* of June 14, 2022, Latvia suspended mandatory blending of biofuels for the period of July 1, 2022, through December 31, 2023, in an effort to staunch rising fuel prices. During this period, adding biofuels to gasoline and diesel is voluntary.

Tax incentives

Until 2021, the Latvian tax law supported the blending of biofuels by reducing the rate of excise duties. In 2021, changes were introduced that raised the reduced rates (i.e., reducing the reduction) of excise duty on biofuels.

As of February 1, 2021:

- the reduced rate of excise duty on biodiesel used as fuel is abolished and a minimum duty rate applies - EUR 330 per 1000 liters of biodiesel entirely derived from biomass and paraffinized diesel from biomass;
- the reduced tax rate is increased from EUR 152.7 to EUR 360 per 1000 liters for unleaded petrol with a high bioethanol content (from 70-85 percent by volume) (fuel E85).

As of July 1, 2021:

- the reduced excise duty rate on biodiesel used for heating is abolished and a minimum duty rate applies - EUR 21 per 1000 liters of biodiesel entirely derived from biomass and paraffinized diesel fuel derived from biomass, provided that those products are labelled (marked);
- a single tax rate EUR 60 per 1000 liters is set for petroleum products used for heating, irrespective of the blending of biofuels, if those petroleum products are labelled (marked).

However, the excise duty rates still favor biofuels, as the Latvian excise duty rates on leaded petrol is EUR 594 per 1000 liters, on unleaded petrol is EUR 509 per 1000 liters, and on diesel EUR 414 per 1000 liters.

Lithuania

	Overall Percentage (% cal)	Advanced Biofuels (% cal)	Cap on crop-based biofuel (% cal)	Cap on UCO- and cat I and II animal fat-based biofuels (% cal)	Double counting
2021			6.2		Yes
2022	6.8	0.2	No more than 1 % higher than the total share in 2020	1.7	
2023	7.2	0.4			
2024	7.8	0.7			
2025	8.6	1.0			
2026	9.8	1.4			
2027	11.3	1.8			
2028	12.9	2.2			
2029	14.7	2.7			
2030	16.8	3.5			

Source: FAS Warsaw based on the Lithuanian *Law on Alternative Fuels* of 2021

Mandatory blending of biofuels into fossil fuels.

Fuel sales points must sell the following fuels meeting the Lithuanian or European standards:

- petrol containing a minimum of 10 percent of biofuel (blending into 98-octane petrol is optional);
- diesel containing at least 7 percent of biofuel.

The Lithuanian Parliament on March 23, 2021, approved the *Law on Alternative Fuels (LAF)*. Under the law, the transport sector will be encouraged to shift to electricity, biomethane, and hydrogen, increasing the requirements for blending biofuels. The LAF establishes clear directions for the development of alternative fuel vehicles and the infrastructure required for them.

The LAF introduces progressively increasing obligations for fuel suppliers regarding the use of biofuels, which will be possible to implement more flexibly over the years. In order to encourage the use of biomethane and other advanced biofuels and hydrogen, their blending will be offset by twice the energy value. In order to comply with the obligation provided for in LAF, fuel suppliers must ensure that each liter of petrol supplied to the internal market contains at least 6.6 percent of biofuels and that each liter of diesel supplied to the internal market contains at least 6.2 percent of biofuels, calculated on the basis of the total energy value of the mixture of fuels and biofuels.

Excise duty concession for biofuels

Biofuel and fuel blends complying with the requirements laid down in the *Law on Excise Duty* and the standards *EN 14214* and *CEN/TS 15293* adopted by the European Committee for Standardization are subject to an excise duty rate reduced in proportion to the percentage of impurities of biological origin in the biofuel and fuel blend.

The Netherlands

	Overall Percentage (% cal)	Of which advanced Annex IX-A biofuels (% cal)	Cap on conventional crop-based biofuel (% cal)	Multiple counting
2021	17.5	1.26	1.4 0 for Biofuels made from palm and soy, except for certified low-ILUC-risk feedstock	Annex IX A and B: x 1.6 Electricity: x 4 Gaseous fuels: x 2 Maritime: x 0.8 Aviation: x 1.2
2022	17.9	1.8		
2023	18.9	2.4		
2024	19.9	2.9		
2025	21	3.6		
2026	22.3	4.2		
2027	23.6	4.9		
2028	25	5.6		
2029	26.5	6.3		
2030	28	7		

Source: FAS The Hague based on ePURE

Annex IX-B biofuels: A cap is fixed at 10 percent on the use of biofuels from used oils and fats (double counted).

Penalties: A fuel supplier failing to fulfil the quota obligation can be brought to Court.

Poland

	Overall Percentage (% cal)	Biodiesel (% cal)	Bioethanol (% cal)	Double counting
2021	8.7	5.2	3.2	Yes
2022	8.8	5.2	3.2	
2023	8.9	5.2	3.2	
2024	9.1	6.2	3.2	

Source: FAS Warsaw based on the Polish *Act on Bio-components and Liquid Biofuels* as amended by the Polish Parliament in October 2022.

Effective January 1, 2023, an amendment to the Laws on *Biocomponents and Liquid Biofuels* and on the *System for Monitoring and Controlling Fuel Quality* removed the obligation to sell E5 gasoline (with 5% bioethanol) at gas stations if E10 gasoline (with 10% bioethanol) is offered at the same station at the same time.

The amendment also set the minimum level of fulfilment of the National Indicative Target (NIT) in 2023, which entitles the operators to use the substitution fee mechanism, at 80 percent (maintaining the

reduced level as in 2020-2022). The new legislation also extended the possibility of using the 0.82 reduction factor for another year, lowering the mandatory blending for diesel fuel to 5.2 percent (the limit set at 6.2 percent level, but reduced in 2020 to 5.0 percent), and raising to 0.9 percent the limit on using HDRD. The amendment also includes raising to 0.5 percent (from 0.45 percent in 2020-22) the limit on the use of biocomponents produced from certain raw materials such as algae, bio-waste, biodegradable municipal waste, straw, biomass fractions from forest management, among others.

Proposed changes

A draft law proposes 95-octane motor gasoline shall be sold in Poland in the format of E10, while 98-octane gasolines will remain in the E5 format. For this, it is proposed to set mandatory blending for 95-octane motor gasoline at 5.3% (and detailing that 4.59% should be realized with bioethanol), while for 98-octane gasoline, the level of mandatory blending shall remain unchanged at 3.2%.

Portugal

	Overall Percentage (% cal)	Biodiesel (% cal)	Bioethanol/ ETBE (% cal)	Advanced Biofuels (% cal)	Cap on conventional crop-based biofuel (% cal)	Double counting
2021	11	-	-	0.5	7 ¹⁾	Yes
2022	11			0.2		
2023	11.5			0.7		
2024	11.5			0.7		
2025-2026	13			2		
2027-2028	14			4		
2029-2030	16			7		

Sources: FAS Madrid based on

Consumption mandates: [Decree-Law 117/2010](#), [Decree-Law 69/2016](#), [Law 42/2016](#), *Budget Law* for 2018 and 2019 and [Decree-Law 8/2021](#) as amended by [Rectification Declaration 9-A/2021](#), and [Decree-Law 84/2022](#)

Double counting: [Decree-Law 117/2010](#) and Annex III in [Implementing Order 8/2012](#)

1) Food-based biofuels are capped at 2020 levels up to one percent higher, but with a maximum cap of seven percent for each MS.

Penalties

Failing to meet the mandates is sanctioned with the following penalties:

Year	Penalty
2011 and onwards	2,000 Euros per TdB (Biofuel Entitlement, equals a Ktoe) that the obliged party fails to meet.

Source: FAS Madrid based on [Implementing Regulation 301/2011](#)

For additional information about Portugal’s biofuel sector, see GAIN Report PO2020-0001 Portugal Biofuels Policy and Market available through the FAS report database at <https://gain.fas.usda.gov/#/search>.

Romania

	Overall Percentage (% cal)	Biodiesel (% cal)	Bioethanol (% cal)	Double counting
2021 and onwards	10	6.5	8.0	Yes

Sources: FAS Bucharest based on *Government Decisions 1121/2013* and *931/2017*

Penalties

Those failing to meet the mandates are sanctioned with the following penalties:

Year	Penalty
2019 and onwards	RON 70,000-100,000 (approx. USD 15,000-22,000)

Source: FAS Bucharest based on provisions of *Emergency Ordinance 80/2018*

Romania transposed RED II into Romanian national legislation through *Emergency Ordinance 163/2022*.

Slovakia

	Overall Percentage (% cal)	Bioethanol (% vol)	Biodiesel (% vol)	Advanced Biofuels (% cal)	Double Counting
2021	8.0	Minimum E9¹⁾	Minimum B6.9¹⁾	0.3	Yes
2022	8.2			0.5	
2023	8.6			0.65	
2024	8.8			1.05	
2025	9.2			1.4	
2026	9.5			1.75	
2027	10.0			2.1	
2028	10.4				
2029	10.8				
2030	11.4				

Source: FAS Prague based on

- *Act on the Support of Renewable Energy Sources and Highly Efficient Cogeneration, and on Amendments to Certain Acts No. 309/2009 Coll.* and
- *Act No. 362/2019 Coll.* amending *Act No. 609/2007 Coll.*, on excise duty on electricity, coal and natural gas, and amending *Act No. 98/2004 Coll.*, on excise duty on mineral oil
- 1) *Act No. 362/2019 Coll.* stipulates that motor gasoline sold on the Slovak market must contain at least nine percent of a bioethanol component (ETBE/bioethanol) in one liter, and diesel must contain at least 6.9 percent of a biodiesel component, as of January 1, 2020.

An extensive amendment (no. 363/2022) to the *Act on Support of Renewable Energy Sources and Highly Efficient Cogeneration, and on Amendments to Certain Acts No. 309/2009 Coll.* that transposes the RED II to Slovak national legislation entered into force on January 1, 2023. It updated the overall mandates for bioethanol and biodiesel and for the advanced biofuels. The amendment also introduced mandates for Compressed Natural Gas (CNG) and Liquid Natural Gas (LNG).

Slovenia

	Overall Percentage (% cal)	Biodiesel/ Bioethanol	Advanced Biofuels (% cal)	GHG Emission Reduction (%)	Cap on crop-based biofuels (% cal)	Multiple Counting
2021	10.0	No specific target	0.2	6	7	Yes (wastes, residues, non-food cellulosic material, lingo-cellulosic material – Annex IX-A biofuels)
2022	10.1					
2023	10.3					
2024	10.6					
2025	11.2					

Source: FAS Vienna based on ePure and the *Regulation on Renewable Energy Sources in Transport 2016* ([Uredba o obnovljivih virih energije v prometu](#)) and its amendments in 2021, and 2022 lays down Slovenian requirements for biofuels in the transport sector.

Penalties:

Fuel retailers not reaching the target will be allowed to offset the shortfall with any surpluses in the preceding or following three years.

Spain

	Overall Percentage (% cal)	Biodiesel (% cal)	Bioethanol (% cal)	Advanced Biofuels (% cal)	Cap on crop-based biofuels (% cal)	Double counting
2021	9.5	-	-	0.1		Yes
2022	10	-	-	0.2	7	
2023	10.5	-	-	0.3	3.5	
2024	11	-	-	0.5	3.1	
2025	11.5	-	-	1	2.6	
2026-2029	12	-	-	1.25	2.6	
2030	14	-	-	3.5	2.6	

Source: FAS Madrid based on [Royal Decree-Law 4/2013](#), [Royal Decree 1085/2015](#), [Royal Decree 376/2022](#), and [Ministerial Order TED 1342/2022](#)

[Resolution of 29 of September 2021](#) established a 3.1 percent cap on high ILUC-risk biofuels as of 2022. [Royal Decree 376/2022](#) classifies raw materials in two groups for double counting purposes:

Group A (qualify as advanced): Algae, bacteria, Organic Fraction of Municipal Waste (OFMSW), industrial residues not fit for food or feed use, forest residues and other cellulosic or lignocellulosic material, sewage sludge, straw, cobs cleaned of kernels of corn, husks, animal manure, glycerin, tall oil pitch, palm oil mill effluent and empty palm fruit bunches, bagasse, grape marcs, wine lees, nut shells, and renewable liquid and gaseous fuels of non-biological origin.

Group B (do not qualify as advanced): Used Cooking Oils and Animal Fats (Categories I and II according to [Regulation \(EC\) 1069/2009](#)).

Penalties

Those failing to meet the mandates are sanctioned with the following penalties:

Year	Penalty
2008 - 2021	763 Euros per missing certificate (each certificate equals one Ktoe.)
Since 2022	1,623 Euros per missing certificate (each certificate equals one Ktoe.)

Source: FAS Madrid based on [Resolution of 17 of December of 2021](#) by the Ministry for Ecological Transition and Demographic Challenge.

[Royal Legislative Decree 6/2022](#) established the obligation to reduce by 6 percent GHG emissions by fossil fuels in 2023.

For additional information about Spain's biofuels sector, see GAIN Report SP2020-0026 available through the FAS report database at <https://gain.fas.usda.gov/#/search>.

Sweden

	GHG Reduction Target	
	Gasoline (%)	Diesel (%)
2022	7.8	30.5
2023	7.8	30.5
2024	12.5	40
2025	15.5	45
2026	19	50
2027	22	54
2028	24	58
2029	26	62
2030	28	66

Source: FAS The Hague based on ePURE

Attempts to relax GHG reduction targets: In 2022, the government agreed to freeze annual increases to the emissions reduction targets in 2023 to cope with fuel price inflation. Additionally, the government is discussing lowering the GHG reduction targets for 2024-2026.

Penalties

Fuel suppliers failing to fulfill their GHG obligations must pay a penalty per kgCO₂eq of SEK 5 (€0.48) for petrol and SEK 4 (€0.39) for diesel. Suppliers selling fossil fuels with no biofuel content must pay a fee of SEK 0.39/l of petrol (€0.038) and SEK 2.69/l of diesel (€0.26). High blends, such as E85, ED95, HVO100, and FAME100, do not count towards the achievement of the obligations and are incentivized through a tax reduction. (*source: ePURE*).

Related reports: Please check the FAS report database for related reports at <https://gain.fas.usda.gov/#/search> .

Attachments:

No Attachments.