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REPORT FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT AND THE COUNCIL

Quality of petrol and diesel fuel used for road transport in the European Union (Reporting year 2020)

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1. INTRODUCTION

Pursuant to Article 7a of Directive 98/70/EC[1] relating to the quality of petrol and diesel fuels (henceforth the "Fuel Quality Directive") and Article 5 of Council Directive (EU) 2015/652 laying down calculation methods and reporting requirements pursuant to Directive 98/70/EC[2], Member States are required to report annually on the greenhouse gas (GHG) intensity of fuels and energy supplied in their territories. This reporting obligation applied for the first time for the reporting year 2017, following the application and transposition of Council Directive (EU) 2015/652. This annual report comprises the data reported for the year 2020.

Furthermore, pursuant to Article 8(3) of Directive 98/70/EC Member States are required to report on national fuel quality data for the preceding calendar year.

This annual report summarises the information provided by Member States in relation to the above-mentioned reporting requirements. It is based on the data submitted by Member States to the European Environment Agency (EEA) for the year 2020.

2. VOLUMES AND LIFE CYCLE GREENHOUSE GAS INTENSITY OF FUEL AND ENERGY TYPES

Article 7a of the Fuel Quality Directive, in conjunction with the Council Directive (EU) 2015/652, sets out reporting requirements concerning the following:

- the total volume of each type of fuel or energy supplied for road transport and non-road mobile machinery (including inland waterway vessels when not at sea), agricultural and forestry tractors, and recreational craft when not at sea;
- the life cycle GHG emissions per unit of energy, including the provisional mean values of the estimated indirect land use change (ILUC) emissions from biofuels[3];
- the feedstock and the biofuel production pathway used for each of the biofuels supplied on the territories of Member States.

The Fuel Quality Directive obliges Member States to require fuel suppliers to reduce the life cycle GHG intensity of transport fuels, i.e., the life cycle GHG emissions per unit of energy from fuel and energy supplied, by a minimum of 6% by 31 December 2020 compared with the fuel baseline standard for 2010 of 94.1 gCO2eq/MJ. ILUC GHG emissions are not taken into account in assessing compliance with the minimum 6% reduction target. The Renewable Energy Directive (EU) 2018/2001[4] foresees several measures to address ILUC including a cap

[1] Directive 98/70/EC of the European Parliament and of the Council relating to the quality of petrol and diesel fuels and amending Council Directive 93/12/EEC, OJ L 350 of 28.12.1998, p. 58.

[2] 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, OJ L 107 of 25.4.2015, p. 26.

[3] Directive (EU) 2015/1513 of the European Parliament and of the Council of 9 September 2015 amending Directive 98/70/EC relating to the quality of petrol and diesel fuels and amending Directive 2009/28/EC on the promotion of the use of energy from renewable sources, OJ L239 of 15.9.2015, p. 8.

[4] 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, OJ L 328, 21.12.2018, p. 82–209

on food- and feed-based biofuels, with its delegated act[5] setting out detailed criteria for determining high ILUC-risk feedstock for biofuels to be gradually phased-out by 2030 and the criteria for certifying low ILUC-risk biofuels, bioliquids and biomass fuels.

In the year 2020, all 27 Member States, UK, Norway and Iceland provided data on greenhouse gas emission reductions in the appropriate format. However, the UK provided data without separating out the data for Northern Ireland[6], therefore no data for Northern Ireland could be included in the aggregated figures of the report. Since the reporting obligation for 2020 does not apply to the UK as a whole, data for the whole of the UK is not included in the report either. Still, some data for Northern Ireland, which were provided outside the reporting submission format, are included in this report. The comparisons between aggregated figures refer to EU-27 for all reference years.

2.1 Greenhouse gas emissions and distance to 2020 target

According to the data provided, the average GHG intensity of the fuels and energy supplied in the 27 reporting Member States in 2020 was 89 $gCO_{2eq/}MJ$, which translates into a saving of 51 Mt of carbon dioxide equivalent (CO_{2eq}) during the year 2020. This is 5.5% lower than the 2010 baseline of 94.1 gCO2eq/MJ (up from a 4.3% reduction achieved by 27 EU Member States in 2019), which means that an additional 0.5% reduction in the GHG intensity of all fossil fuels, biofuels and energy supplied is needed to reach the 6% target.

Reported data for 2020 shows that the progress achieved by EU fuel suppliers varies greatly across the EU Member States. Eleven Member States (Belgium, Cyprus, Czechia, Denmark, Estonia, Finland, Germany, Hungary, Luxembourg, Malta and Sweden) have achieved their objective of reducing the GHG intensity of transport fuels by 6% by 2020, compared with 2010 (see *Figure 1*). This represents an important improvement for many Member States in comparison to the reporting year 2019 when only two Member States, Sweden and Finland, had achieved the 6% target. The largest progress within a year was achieved by Cyprus and Estonia with 4.7 and 4.5 percentage points increases between 2019 and 2020, against the 2010 baseline, followed by Belgium, Denmark and Hungary with increases ranging from 3.3 to 3.1 percentage points. Based on the preliminary data supplied by UK[7], Northern Ireland has achieved a 6.2% GHG intensity reduction for fuel supplied in Northern Ireland in 2020.

In terms of the remaining distance towards the target, Slovakia, Netherlands and Austria are already very close to achieving the 6% target with 5.8%, 5.4% and 5.1% respectively, while Romania, Poland, Italy, France, Bulgaria and Greece have achieved reductions in the range between 4% and 5%. Finally, in seven Member States (Slovenia, Spain, Portugal, Lithuania, Ireland, Latvia and Croatia), the reduction of GHG intensity remains lower than 4%. Further information can be found in the EEA Technical Report No 2022/2 on "Greenhouse gas intensities of transport fuels in the EU in 2020"[8].

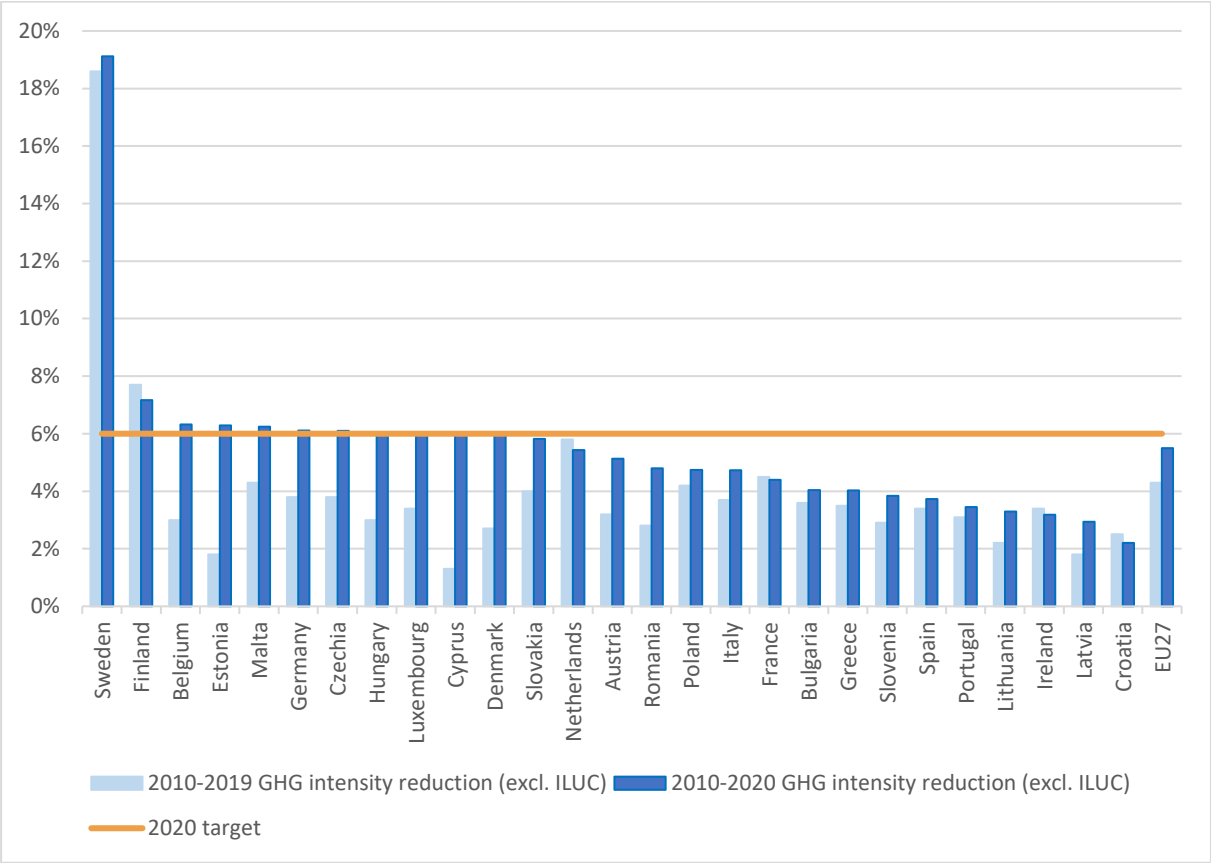
[5] C(2019) 2055 final: https://ec.europa.eu/energy/sites/ener/files/documents/2_en_act_part1_v3.pdf

[6] Following the end of the transition period, Council Directive (EU) 2015/652 setting out relevant reporting obligations no longer applies to the UK as whole. However, pursuant to Article 5(4) read in conjunction with Annex 2, point 47 of the Protocol on Ireland/Northern Ireland to the Withdrawal Agreement (https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:12020W/TXT), Council Directive (EU) 2015/652 continues to apply to and in the UK in respect of Northern Ireland.

[7] The UK is currently finalising their reporting submission for Northern Ireland under Article 7a of the FQD and in accordance with Article 5 of Council Directive (EU) 2015/652.

[8] https://www.eionet.europa.eu/etcs/etc-cm/products/etc-cm-report-2022-02

Figure 1: Reductions in GHG intensity of fuels achieved by EU fuel suppliers in Member States in the periods 2010-2019 and 2010-2020 *(Source: EEA)*



Furthermore, in 2020, upstream emission reductions (UER)[9] were reported by eleven Member States (Austria, Cyprus, Czechia, Denmark, Estonia, Hungary, Italy, Luxembourg, Poland, Romania and Slovakia) contributing between 0.3 and 2.3 percentage points in these Member States to the overall GHG emission reduction achievement. Consequently, the total reported UER were 2 625 kt CO_2eq in 2020 resulting in an additional reduction of 0.3 percentage points of the fuel GHG intensity from 5.2% to 5.5% (see *Table 5 in the Annex of the report*). The UER claimed by a supplier have to be quantified and reported in accordance with the requirements set out in Council Directive (EU) 2015/652. More detailed information on approaches to quantify, monitor and report on UER can be found in a guidance note[10].

When taking ILUC emissions into account[11], the average GHG intensity of the fuels supplied in 2020 in the EU was 3.3% lower than in 2010. This corresponds to a saving of 30 Mt CO_{2eq} during the year 2020. According to Article 7d of Directive 98/70/EC laying down the calculation of life cycle greenhouse gas emissions from biofuels, ILUC emissions are not taken into account in assessing compliance with the minimum 6% reduction target.

Further action will be necessary in order to decarbonize the fuel used in transport and contribute to the increased climate ambition, as set out in the European Green Deal and the subsequent "Fit For 55" legislative package proposed by the Commission on 14 July 2021 and undergoing co-decision processes. The proposed revision of the Renewable Energy

[9] "Upstream emissions" means all greenhouse gas emissions occurring prior to the raw material entering a refinery or a processing plant where the fuel is produced.

[10] https://ec.europa.eu/clima/system/files/2016-11/guidance_note_on_uer_en.pdf

[11] For this calculation, the provisional estimated indirect land-use change emissions from biofuels were taken into account as listed in Annex V of the Fuel Quality Directive.

Directive[12] substantially increases the overall ambition in order to reduce the GHG emission intensity of all transport fuels by 13% by 2030 compared with the 2010 baseline, while the Commission has proposed to repeal the 6% reduction target of the FQD in order to avoid double regulation and streamline the legislation. The proposed ReFuelEU Aviation and FuelEU Maritime Regulations also aim to boost the production and uptake of the sustainable alternative fuels in the aviation and maritime sectors.

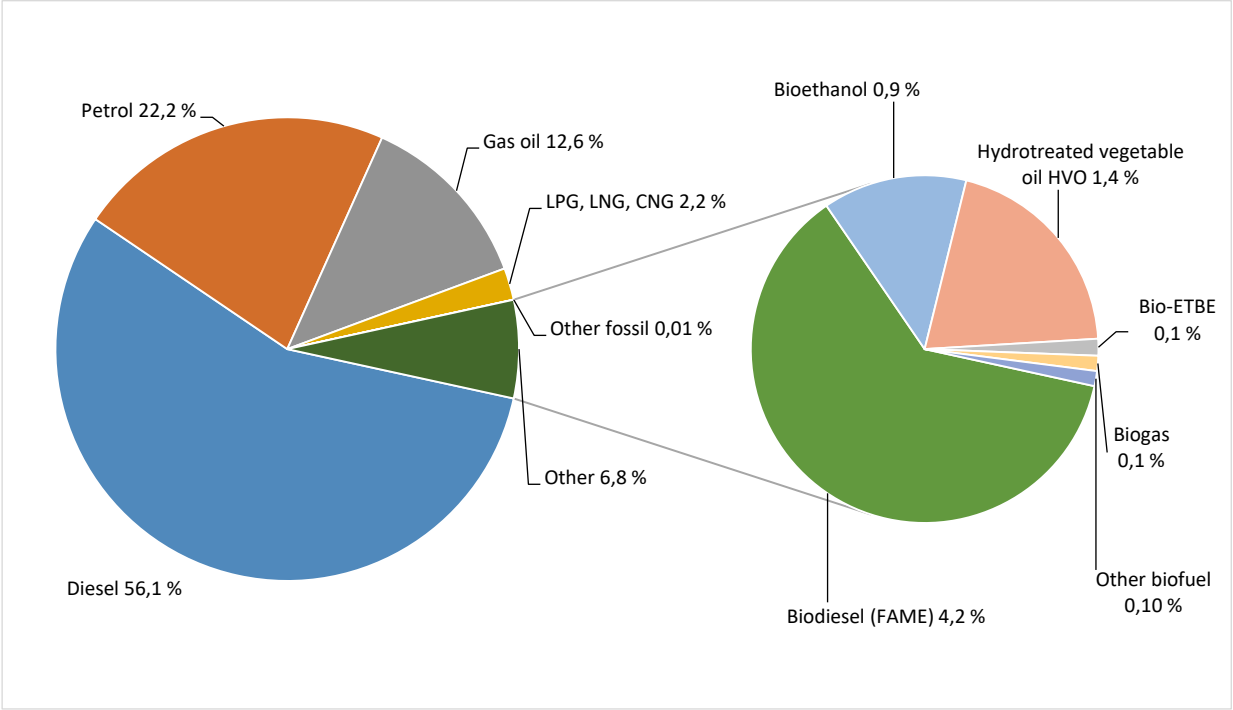
2.2 Fuel supply

This section summarises the data submitted by Member States on all fossil fuels, biofuels and fuels of non-biological origin within the scope of the Fuel Quality Directive for road transport and non-road mobile machinery.

Total fuel supply reported by the 27 Member States in 2020 was 10 585 petajoules (PJ), representing a decrease of 10.8 % compared to 2019, largely as a result of the effects of the COVID-19 crisis. The fuel supply remained largely dominated by fossil fuels (93.2%) followed by biofuels (6.8%) and a very minor share (0.02%) of electricity (see *Section 2.4*). No renewable fuels of non-biological origin were reported in 2020.

The fossil fuel supply in 2020 remained dominated by diesel (56.1%; 5 934 PJ), followed by petrol (22.2%; 2 354 PJ) and gas oil (12.6%; 1 337 PJ). Liquefied petroleum gas and natural gas had a combined share of 2.2% (236 PJ) (see *Figure 2*).

Figure 2: Fuel energy supply shares per fuel type in 2020 *(Source: EEA)*



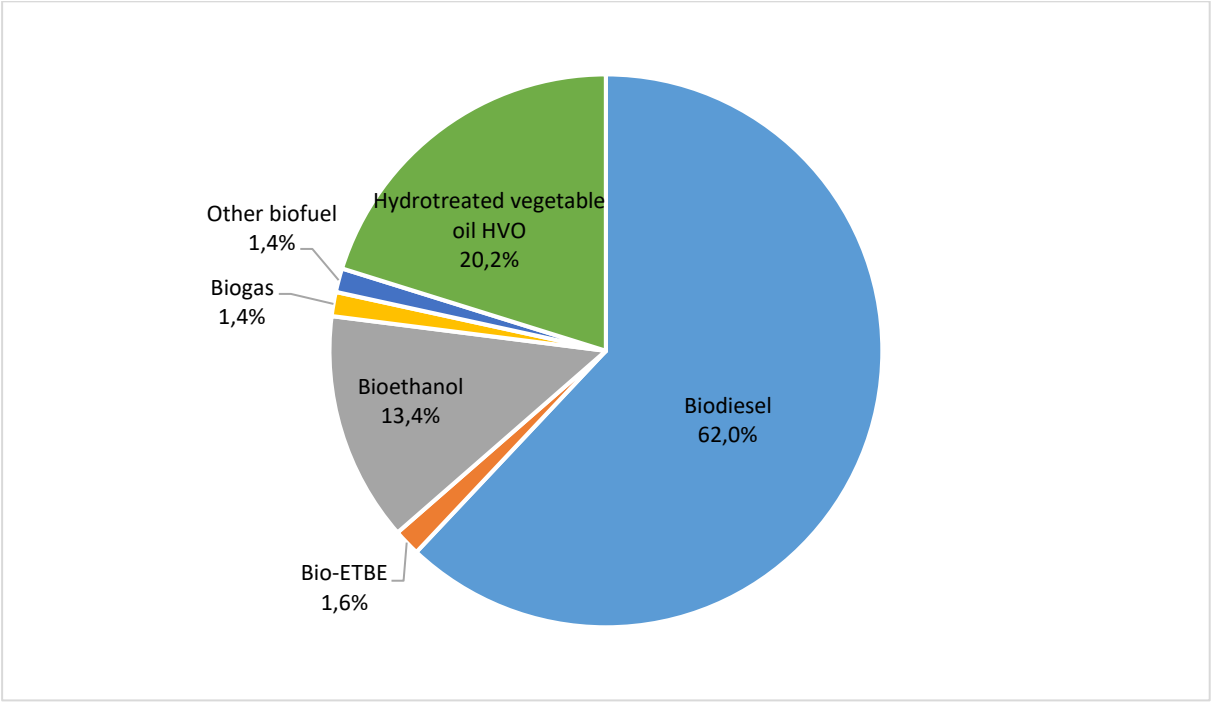
2.3 Biofuel consumption

The total biofuel consumption increased slightly from 693 PJ to 723 PJ between 2019 and 2020 in the 27 Member States. It continues to be dominated by biodiesel (fatty acid methyl ester, FAME) accounting for 62.0% of the total biofuel consumption (449 PJ), followed by hydrotreated vegetable oil (HVO) (20.2%; 146 PJ), and bioethanol (13.4%; 97 PJ). Bio-ethyl tert-butyl ether (bio-ETBE) accounted for 1.6% (11 PJ) and biogas for 1.4% (10 PJ) of the total biofuel consumption. All other biofuels represented a much smaller share (see *Figure 3*).

[12] https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52021PC0557

Thus, more than 80% of all biofuels are blended into diesel fuel. Detailed information for all biofuels and pathways can be found in the EEA Technical Report No 2022/02.

Figure 3: Biofuel energy supply shares per fuel type in 2020 ***(Source: EEA)***



2.4 Electricity consumption

The reporting of electricity consumption by fuel suppliers is voluntary and fifteen Member States (compared to eleven in 2019) reported data on electricity consumed by electric vehicles and motorcycles (see *Table 1*). The total reported quantity of electricity consumed by electric vehicles has increased to 6 218 196 GJ (excluding powertrain efficiency adjustment) from 3 714 644 GJ in 2019, representing a 67% increase. The actual electricity consumption of electric vehicles in the different Member States may be larger since the reporting of electricity is not compulsory under Article 7a and is still not reported by many Member States albeit it would contribute towards achieving the 6% target.

Table 1: Electricity consumed by electric vehicles and motorcycles in 2020 as a reported contribution by fuel suppliers to their GHG reduction target (*Source: EEA*)

Member State	Quantity of energy		GHG intensity	
	excluding powertrain efficiency (GJ)	including powertrain efficiency[13] (GJ)	reported by Member State (g CO_2e/MJ)	reported by Member State (g CO_2e/kWh)
Austria	69 971	27 988	21.8	78
Bulgaria	129 600	51 840	522.0	1 879
Czechia	1 085	434	177.0	637
Estonia	62 091	24 836	114.5	412
France	1 526 400	610 560	16.6	60
Germany	2 394 000	957 600	153.0	551
Hungary	17 387	6 955	56.3	203
Ireland	176 276	70 511	110.1	396
Italy	234 015	93 606	110.3	397
Netherlands	766 091	306 437	141.0	508
Portugal	37 350	14 940	65.7	237
Romania	645 225	258 090	-	-
Slovakia	155 950	62 380	46.4	167
Slovenia	2 447	979	97.5	351
Sweden	308	123	13.0	47
Total	**6 218 196**	**2 487 279**		

3. OVERVIEW OF THE 2020 FUEL QUALITY DATA IN THE EU

According to Article 8 of the Fuel Quality Directive, all 27 Member States, Norway, and the United Kingdom in respect of Northern Ireland submitted reports on national fuel quality data for the year 2020.

This section provides the data for petrol and diesel sales, and the biocomponents included therein, for road transport reported by 27 EU Member States. It excludes other fossil fuels, other biofuels and fuels of non-biological origin, as well as fuels used for non-road mobile machinery.

3.1 Petrol and diesel

The share of diesel has remained stable between 2017 and 2020, reaching the value of 73.2% of total sales in 2020. Earlier it had increased somewhat, from 71.2% in 2014 to 73.3% in 2017. This is the legacy of the, so called, dieselisation of Europe's vehicle fleet over the last decades that came to halt in the wake of the diesel emissions scandal. The total amount of diesel sold in 2020 has decreased by 12% when compared with 2019 as an effect of the COVID-19 crisis. The petrol sales in 2020 decreased by similar percentage (12.4%) (see *Table 2*).

[13] In accordance with Annex I, Part 1 of the Council Directive (EU) 2015/652, the GHG reduction target is calculated on the basis of electricity quantities using the adjustment factor for the EV technology, which corresponds to the inclusion of the powertrain efficiency.

Table 2: Diesel and petrol fuel sales for EU-27 (in million litres and their respective shares) in 2017 – 2020

	2017	2018	2019	2020
Diesel fuel sales	235 388 (73.3%)	241 653 (73.3%)	246 865 (73.0%)	217 395 (73.2%)
Petrol fuel sales	85 911 (26.7%)	87 994 (26.7%)	90 917 (27.0%)	79 659 (26.8%)
Total (diesel and petrol)	**321 299**	**329 629**	**337 782**	**297 054**

Diesel fuel consumption is dominant in all EU Member States, except in Cyprus where the proportion of petrol use is 50%. Other countries with relatively high petrol consumption are Greece, Netherlands and Finland with the corresponding shares of 45%, 42% and 38% respectively, while on the other end, in Bulgaria, Latvia and Lithuania, the corresponding petrol shares range from 18%, 16% and 13% respectively.

There are no significant changes in the distribution of petrol sales in terms of petrol grade research octane numbers (RON) between 2019 and 2020. The majority of petrol sales in 2020 comprised fuels with a petrol grade RON 95, the share of which slightly increased compared to 2019. The share of $95 \leq RON < 98$ sales decreased, while the share of $RON \geq 98$ sales slightly increased compared to preceding year (see *Table 3*).

Table 3: Share of petrol sales in EU-27 according to RON numbers

	2017	2018	2019	2020
RON 95	84.3%	80.0%	77.8%	79.3%
95 ≤ RON < 98	8.5%	14.9%	16.7%	14.3%
RON ≥ 98	6.9%	4.9%	5.4%	6.4%
RON = 91	0.2%	0.2%	0.1%	0.01%

3.2 Biocomponents content

In 2020, almost all petrol and diesel sold in the EU is marketed as containing biocomponents. Of all petrol sold, 99.8% contained biocomponents[14] with the following breakdown: 65.7% contained up to 5% ethanol content by volume (E5) which is by 7.6 percentage points less than in 2019, while 33.3% contained up to 10% ethanol content (E10) demonstrating an increase by 7.6 percentage points in comparison to 2019; 1.0% of petrol contained more than 10% ethanol (E+[15]).

Of all the diesel fuel sold, 99.7% contained biocomponents, whereas 86.2% of diesel fuel contained up to 7% FAME (B7), 13.8% contained more (B+)[16] showing an important increase from 0.8% in 2019 (see *Table 4*).

[14] This includes bioethanol directly blended into petrol or converted to ETBE and then blended into petrol.
[15] E+ is petrol fuel with > 10% (% v/v) ethanol content
[16] B+ is diesel fuel with > 7 % (% v/v) biodiesel content

Table 4: Use of biocomponents in petrol and diesel fuels sold in the EU-27 in 2017-2020

Fuel type		2017	2018	2019	2020
Petrol	E0	14.5%	4.9%	0.7%	0.0%[17]
	E5	66.7%	81.5%	73.3%	65.7%
	E10	18.6%	13.4%	25.7%	33.3%
	E+	0.1%	0.2%	0.4%	1.0%
Diesel	B0	0.0%	0.0%	0.0%	0.0%[18]
	B7	81.8%	99.2%	99.1%	86.2%
	B+	16.2%	0.8%	0.8%	13.8%

3.3 Compliance of sold fuels with quality limits

Overall in the EU, a high compliance with the fuel quality limits is observed. The very large majority of key fuel parameters in the samples taken in 2020 were reported within the tolerance limits.

Lithuania, Slovenia and Sweden verified and reported full compliance for both petrol and diesel fuels. Eight Member States verified and reported full compliance for petrol (Bulgaria, Lithuania, Luxembourg, Malta, Netherlands, Romania, Slovenia and Sweden), and seventeen for diesel (Austria, Croatia, Denmark, Finland, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Poland, Portugal, Romania, Slovenia and Sweden).

Member States reported a total of 235 cases of non-compliance for petrol and 90 for diesel, corresponding to a share of 1% and 0.4% respectively of the total number of samples taken in 2020, which is by 33% less than in 2019. For petrol, the most common parameters falling outside the specifications were exceedances of the summer vapour pressure (in fifteen Member States), research octane number (RON, in six Member States), motor octane number (MON, in five Member States), aromatics content (hydrocarbon analysis, in five Member States) and sulphur content (in one Member State, France). For diesel, the most common parameters falling outside the specifications were the sulphur content and the FAME content (in six Member States for both parameters).

All Member States described the actions taken when non-compliant samples were identified. These actions included informing the competent authorities, initiating investigations, imposing penalties and fines, and resampling. In a small number of cases, no action was taken where the non-compliant parameters were found to be very close to the tolerance limits.

There was therefore no need for the Commission to launch any investigation in this area. It can be concluded that the fuel quality monitoring system in place ensures that high quality fuels are sold in the EU in accordance with the requirements of the Fuel Quality Directive.

[17] Only Malta and Slovakia reported 186 million litres of petrol sold with no biofuel content, corresponding to a share of 0.2% of the total petrol sales in 2020 (due to the low share, it is left out of Table 4).

[18] Only Latvia reported 638 million litres of diesel sold in winter period with no biofuel content, corresponding to a share of 0.3% of the total diesel sales in 2020 (due to the low share, it is left out of Table 4).

Annex

Table 5: Upstream Emission Reduction contribution towards the 6% GHG emission intensity target in 2020, excluding ILUC (Source: EEA)

Member state	GHG intensity reduction excluding UERs	UERs contribution	GHG intensity reduction including UERs	GHG intensity incl. UERs (g CO2eq/MJ)	GHG intensity excl. UERs (g CO2eq/MJ)
Cyprus	3.7%	2.3%	6.0%	88.4	90.6
Denmark	3.7%	2.3%	6.0%	88.5	90.6
Austria	3.2%	1.9%	5.1%	89.3	91.1
Hungary	4.2%	1.8%	6.1%	88.4	90.1
Estonia	4.9%	1.4%	6.3%	88.2	89.5
Slovakia	4.5%	1.3%	5.8%	88.6	89.9
Romania	4.0%	0.8%	4.8%	89.6	90.3
Czechia	5.4%	0.7%	6.1%	88.4	89.0
Poland	4.4%	0.4%	4.7%	89.6	90.0
Luxembourg	5.7%	0.4%	6.0%	88.4	88.8
Italy	4.5%	0.3%	4.7%	89.6	89.9
Belgium	6.3%	0.0%	6.3%	88.1	88.1
Bulgaria	4.0%	0.0%	4.0%	90.3	90.3
Croatia	2.2%	0.0%	2.2%	92.0	92.0
Finland	7.2%	0.0%	7.2%	87.4	87.4
France	4.4%	0.0%	4.4%	90.0	90.0
Germany	6.1%	0.0%	6.1%	88.3	88.3
Greece	4.0%	0.0%	4.0%	90.3	90.3
Ireland	3.2%	0.0%	3.2%	91.1	91.1
Latvia	2.9%	0.0%	2.9%	91.3	91.3
Lithuania	3.3%	0.0%	3.3%	91.0	91.0
Malta	6.2%	0.0%	6.2%	88.2	88.2
Netherlands	5.4%	0.0%	5.4%	89.0	89.0
Portugal	3.4%	0.0%	3.4%	90.9	90.9
Slovenia	3.8%	0.0%	3.8%	90.5	90.5
Spain	3.7%	0.0%	3.7%	90.6	90.6
Sweden	19.1%	0.0%	19.1%	76.1	76.1
EU27	**5.2%**	**0.3%**	**5.5%**	**89.0**	**89.2**