ETC CM Report 2023/01

Fuel quality monitoring in the EU in 2021

Fuel quality monitoring under the Fuel Quality Directive

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1 Background and structure of the report

Fuel and fuel combustion products are affecting human and animal directly and indirectly – for example by inhaling gaseous pollutants or by consuming harmful substances deposited in soil, food, and crops.

To minimise the negative effects on health and the environment from the use of petrol and diesel fuels, EU Member States must report information relating to the quality of petrol and diesel fuels sold for road transport in their territories. More specifically, Member States must sample fuels each year and analyse their technical characteristics to ensure that they are consistent with the requirements of Article 8 of the Directive 98/70/EC, relating to the quality of petrol and diesel fuels (the Fuel Quality Directive, FQD).

This report is structured into two main chapters. Chapter 2 provides an overview of the information for the EU while Chapter 3 describes the different national fuel quality monitoring systems. Member State specific information can be found in both chapters – in Chapter 2 in form of several overviews and in Chapter 3 as country fact sheets.

Details on the parameters reported in accordance with Article 8 and their effects on the environment and human health can be found in EEA-Report No 05/2019[1].

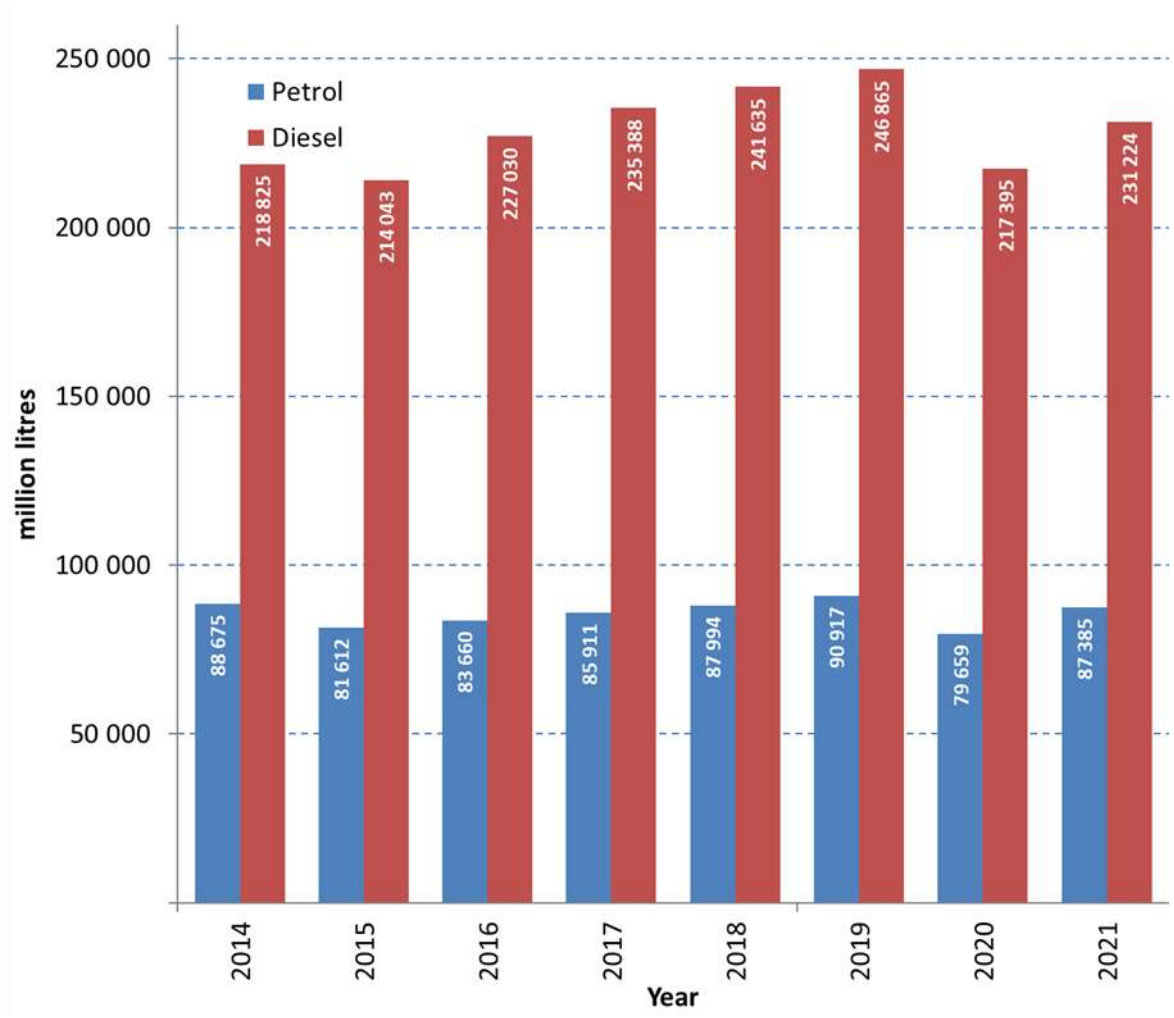
(1) https://www.eea.europa.eu/publications/quality-and-greenhouse-gas-intensities-1

2 Quality of fuels

2.1 Fuel sales

Sales of fuels used for road transport in the EU (EU-27) continue to be dominated by diesel: 72.6% (231 224 million litres) of fuel sold was diesel and 27.4% was petrol (87 385 million litres) in 2021 [(2)]. Petrol and diesel sales in 2021 increased around 9.7% and 6.4% respectively, when compared with 2020 (Figure 2.1).

Figure 2.1 EU-27 petrol and diesel fuel sales in 2021 (million litres).



The proportion of diesel in total fuel sales has increased over the years, from 71.2% of total sales in 2014 to 72.6% in 2021 (Figure 2.2).

(2) Fuels other than petrol and diesel are disregarded here, as the reporting under Article 8 of the Fuel Quality Directive (FQD) is limited to petrol and diesel, for which fuel specifications are laid down in Annexes I and II of the FQD.

This reflects to an increase of freight tonnes kilometres in Europe [3] (the increase of 2% is observed mainly between 2014 and 2016 that then remains stable until 2020). While sales of diesel fuel increased by 12.8% between 2014 and 2019 and sales of petrol fuels also increased by 2.5% during the same period, there was a decrease in both diesel and petrol fuel sales in 2020 by 11.9% and 12.4% respectively in comparison to 2019. This was most likely a consequence of the pandemic of Covid-19. In 2021, there was an increase, compared to 2020, in petrol by 9.7% and in diesel by 6.4% while a comparison of the entire time series (2014–2021) for the EU-27 shows that petrol decreased by 1.5% and diesel increased by 5.7%.

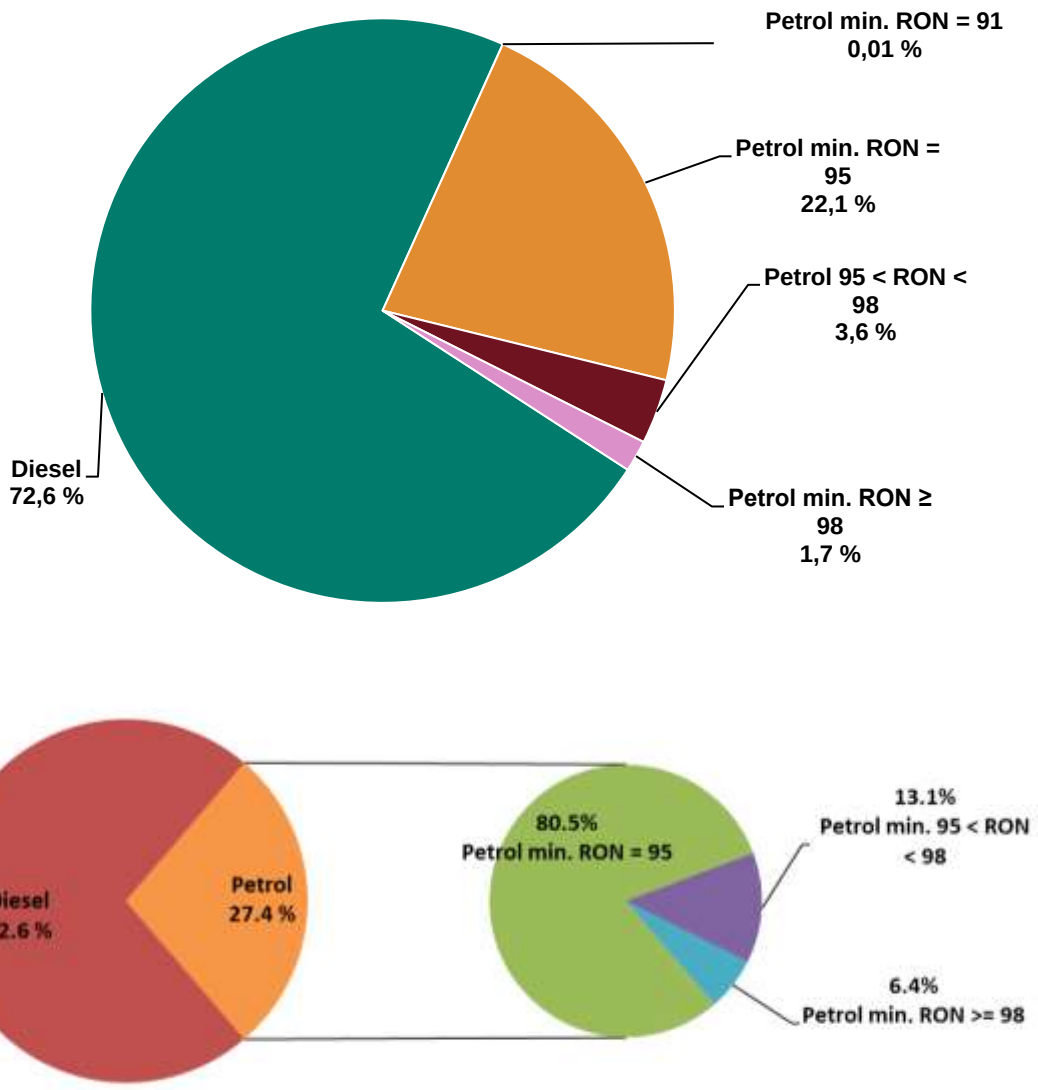
The majority of petrol sales in 2021 comprised of fuels with a petrol grade (of min.) research octane number (RON) of 95, which accounted for 80.5% of the total petrol fuel sales; 13.1% of sales were 95 < RON < 98 and 6.4% were min. RON ≥ 98. There was an insignificant proportion of min. RON 91 grade sales (0.03%).

There are no significant changes in the distribution of fuel grades between 2020 and 2021. Sales of petrol with min. RON = 95 slightly increased from 80.4% in 2020 to 80.5% to 2021[4]. Sales of petrol with 95 < RON < 98 and min. RON ≥ 98 remained stable at 13.1% and 6.4% (2020 and 2021).

[3] EU transport in figures – Statistical pocketbook 2022 (https://op.europa.eu/en/publication-detail/-/publication/f656ef8e-3e0e-11ed-92ed-01aa75ed71a1/language-en/format-PDF/source-277192062)

[4] All comparisons between figures of 2020 and 2021 refer to EU-27 for both reference years.

Figure 2.2 **EU-27 petrol and diesel fuel sales, 2021 (% litres)**



Diesel fuel consumption is dominant (> 60% of total fuel sales) in most Member States, apart from Cyprus, Greece, and the Netherlands (Table 2.1).

The nine Member States with the highest volumes of fuel sold account for 80% of total EU sales, while the remaining 18 Member States with the lowest volumes account for 20% of total EU fuel sales.

Table 2.1 Fuel sales by Member State and fuel type in 2021

Member State	Min. RON = 91	Min. RON = 95	95 < RON < 98	Min. RON ≥ 98	Total petrol	Total diesel
			million litres			
Austria	11	0	1,776	136	1,923	7,800
Belgium	0	0	2 082	567	2 649	7 174
Bulgaria	0	0	589	49	638	2,900
Croatia	0	578	0.2	50	628	2,189
Cyprus	0	0	375.0	38	413	408
Czech Republic	0	1,952	0.0	68	2,020	6,126
Denmark	16	1,574	0.0	138	1,728	3,169
Estonia	0	0	157	125	282	923
Finland[5]	0	1 261	0.0	492	1 753	2 893
France	0	11,869	0	0	11,869	36,903
Germany	0	20,784	0.0	1,236	22,019	41,918
Greece	0	2,208	0.0	506	2,715	3,187
Hungary	0	1,598	0	376	1,974	4,619
Ireland	0	1,136	0.0	0	1,136	3,401
Italy	0	9,277	0.0	0	9,277	29,204
Latvia	0	184	0	30	213	1,220
Lithuania	0	341	0	13	354	2,178
Luxembourg	0	335	0.0	101	436	1,522
Malta	0	99	0.0	3	102	172
Netherlands	0	0	5,129	176	5,305	5,738
Poland	0	5,958	0.0	536	6,494	21,465
Portugal	0	996	0.0	96	1,092	4,244
Romania	0	0	1,294	195	1,488	5,628
Slovakia	0	606	0.0	115	722	2,340
Slovenia	0	440	36	0	476	2,084
Spain	0	6,476	0.0	496	6,972	25,816
Sweden	0	2,699	0	6.9	2,706	6,004
EU27[6]	**27**	**70 370**	**11 439**	**5 549**	**87 385**	**231 224**

2.2 Use of biocomponents

In 2021, close to 100% of all diesel and petrol fuels sold in the EU contained biocomponents[7] (Figure 2.3). No EU Member State reported diesel with 0% biofuel content. Latvia, Malta, and Slovakia reported 247 million litres of petrol in total with 0% biofuel content that have a share of 0.3% out of total sales of petrol[8].

Of petrol sold in the EU in 2021, 65.4% was of the product type E5 (i.e., up to 5% ethanol content by volume and in which the ethanol is derived from biofuels or is of biogenic origin). A total of 34.2% was E10 (i.e., up to 10% ethanol content by volume). Petrol with no ethanol content (previously reported as E0) is included in E5 since last year (2020) due its decreasing share[9]. Only 0.4% of petrol was E+ (i.e., > 10% ethanol content by volume, reported by Czech Republic, France, Latvia, and Lithuania). This refers mainly

(5) 2020 fuels sales of Finland, because because there was no statistical information for national sales for 2021 available.

(6) Taking into account only the 2020 fuels sales of Finland.

(7) This includes bioethanol directly blended into petrol or converted to ETBE and then blended into petrol.

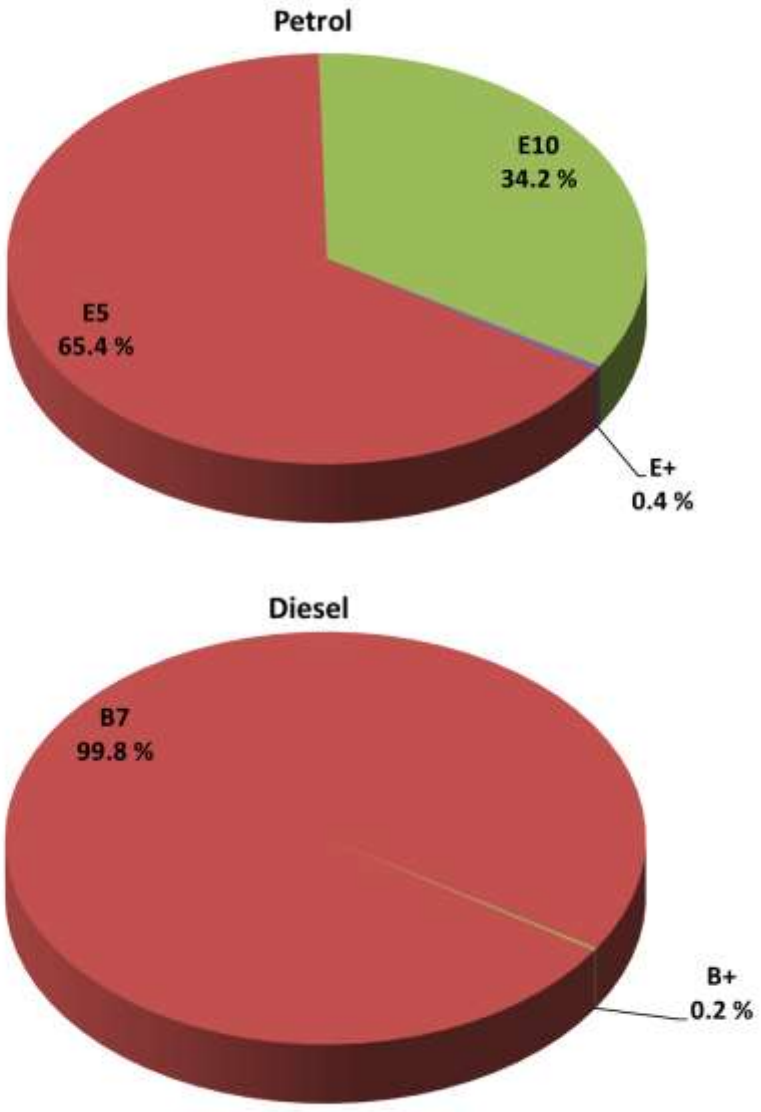
(8) Due to the low share of these fuels, they were left out of Figure 1.3 (they are included in E5).

(9) 0.3 % – coming from Latvia, Malta, and Slovakia.

to E85, used in engines modified to accept a higher content of ethanol. Such flexi-fuel vehicles are designed to run on any mixture of petrol and ethanol with up to 85% ethanol by volume.

Of diesel sold in the EU in 2021, 99.8% was of the B7 product type (i.e., containing up to 7% fatty acid methyl esters, FAME) and 0.2% was of the B+ product type (i.e., containing more than 7% FAME). Diesel with no FAME content (previously reported as B0) is included in B7 since last year due to its decreasing share and for 2021, no EU Member State reported diesel quantity without FAME content.

Figure 2.3 Use of biocomponents in petrol and diesel fuels sold in the EU-27 in 2021 (% litres)



The share of ethanol-containing petrol (E5 and E10) in the EU has increased over the last seven years, from about 89% in 2014 to 99.6% in 2021, as illustrated in Figure 2.4. The share of non-ethanol-containing petrol (E0) has decreased even further reaching only 0.3% in 2021 compared to 2019 (0.7%) as Cyprus has introduced ethanol in petrol in 2020. In 2014, the share of E0 was 11%.

The decrease of the use of fuel grades with biofuel content with up to 5% (E5) between 2019 and 2021 is due to the change in the geographical scope [10] (almost 4% effect) and because more Member States sold

[10] Regarding the withdrawal of the UK from the EU.

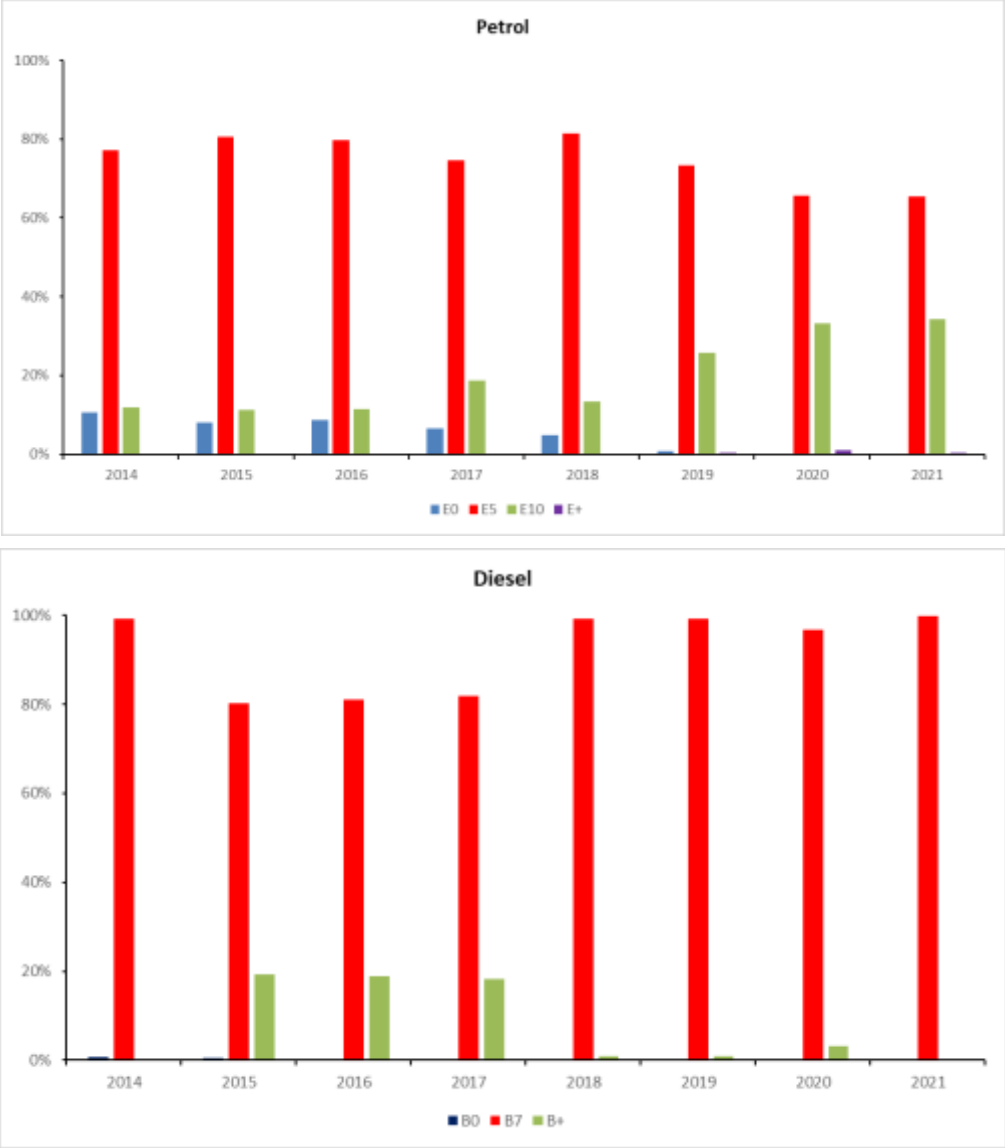
petrol fuel grades with up to 10% of biofuel content (from 12% in 2014, to 34% in 2021). In detail, 11 Member States sold fuel grades with E10 in 2014 in comparison to 18 Member States in 2021 (Cyprus, Denmark, Hungary, Latvia, Slovakia, and Sweden were added).

Almost all diesel contained different levels of biodiesel over the same period. Share of B+ changes significantly between 2014 and 2021 because of different quantities reported by France, allowing the share of biodiesel to be above 7% between 2015 and 2017. For 2021, the share of B+ decreases again due to the lower contribution of Belgium. No EU Member State reported diesel without any biofuel content for 2021 – whereas Latvia only reported it for a 5-month winter period in 2020.

Whereas the use of different biocomponents results in lower overall greenhouse gas (GHG) emissions, the reductions achieved depends greatly on the feedstock used to produce biofuels as well as on the actual production pathways. Details on this topic can be found in the EEA indicator and ETC reports on Article 7(a) of the FQD [(11)].

(11) https://www.eea.europa.eu/ims/greenhouse-gas-emission-intensity-of
https://www.eionet.europa.eu/etcs/etc-cm/products/etc-cm-report-2022-02

Figure 2.4 **Biocomponents in petrol and diesel sold in the EU from 2014 to 2021 (% litres).**



Note: E+, petrol with > 10% ethanol content; E0, petrol with no ethanol content; E5, petrol fuel with up to 5% (percentage volume/volume (% v/v)) ethanol content; E10, petrol with up to 10% ethanol content; B+, diesel fuel with > 7% (% v/v) biodiesel content; B0, diesel with no biodiesel content; B7, diesel fuel with up to 7% (% v/v) biodiesel content. From 2020, E0 is included in E5 and B0 in B7, as explained in the reporting template.

2.3 Monitoring systems and sampling methods

Table 2.2 summarises the main information on the operation of the relevant fuel quality monitoring system (FQMS) by Member States, including model used, country size and sampling method, as well as the number of samples required.

The information contained in this table is described in more detail below.

Table 2.2 Fuel quality monitoring system summary.

Member State	FQMS model	Country size	Summer and winter sampling	Total samples required (a)	
				Petrol	Diesel
Austria	Statistical model A	Small	Yes	108	100
Belgium	National system	Small	Yes	National system	National system
Bulgaria	Statistical model A	Small	Yes	108	117
Croatia	Statistical model C	Small	Yes	109	100
Cyprus	Statistical model C	Small	Yes	110	100
Czech Republic	Statistical model C	Small	Yes	103	100
Denmark	Statistical model C	Small	Yes	110	100
Estonia	Statistical model C	Small	Yes	200	100
Finland	Statistical model A	Small	Yes	200	100
France	Statistical model A	Large	Yes	411	202
Germany	Statistical model B	Large	Yes	829	400
Greece	Statistical model A	Small	Yes	200	100
Hungary	Statistical model C	Small	Yes	200	100
Ireland	Statistical model C	Small	Yes	100	100
Italy	Statistical model A	Large	Yes	200	200
Latvia	Statistical model C	Small	Yes	200	200
Lithuania	Statistical model C	Small	Yes	104	100
Luxembourg	National system	Small	Yes	National system	National system
Malta	Statistical model C	Small	Yes	104	100
Netherlands	Statistical model A	Small	Yes	103	100
Poland	Statistical model B	Large	Yes	436	400
Portugal	Statistical model C	Small	Yes	108	100
Romania	Statistical model A	Small	Yes	200	100
Slovakia	Statistical model C	Small	Yes	200	100
Slovenia	Statistical model C	Small	Yes	108	100
Spain	Statistical model A	Large	Yes	215	200
Sweden	National system	Small	Yes	National system	National system

Note: Large country, total automotive road fuel sales of > 15 million tonnes per annum; small country, total automotive road fuel sales of < 15 million tonnes per annum.
(a) Based on EN 14274:2013.

2.3.1 Statistical models

Member States have to indicate whether their monitoring system is set up using the European Standard EN 14274:2013 statistical model A, B or C (see descriptions in Table 2.3) and whether it is based on the large or small country framework. Alternatively, they have to indicate if they are using their own nationally defined system.

24 Member States used one of the three statistical models defined by the European Standard EN 14274:2013. Three Member States (Belgium, Luxembourg and Sweden) used a national monitoring system.

Table 2.3 Main types of statistical models used by Member States

Statistical model	Description
European Standard EN 14274	
European Standard EN 14274 **A: macro-regions**	In this model, the regions within the country are grouped (preserving some geographical identity) into macro-regions so that they have similar total sales volumes relative to each other, as well as approximately the same number of supply sources. This approach is recommended, as it is designed to capture fuel variations efficiently and therefore requires a smaller number of samples. If geographical or other circumstances (e.g., force majeure) do not allow fulfilment of the requirements for the design of this preferred model, model B shall be considered the next best model. The minimum overall number of samples per grade and per season is 50 per small country and 100 per large country.
European Standard EN 14274 **B: non-macro-regions**	If the construction of macro-regions (based on fuel supply patterns) is not possible within a country, then the country shall be divided into regions using only geographical and administrative criteria. To ensure that fuel variability is reliably captured, many samples per grade are required: 100 for small countries and 200 for large countries.
European Standard EN 14274 **C: non-region model**	If the country is small and it can be demonstrated that a division into macro-regions or non-macro-regions is not possible, having considered the procedures and provisions given in this European Standard, then the country shall be considered one region for sampling purposes. A total of 50 samples per grade and per season is required.
National model	Some countries have implemented their own models for the FQMS in accordance with their national legislation.

2.3.2 Information on summer and winter fuel grade sampling

Member States are also requested to define the summer/winter periods implemented in their territories and applying to their FQMS reporting. All Member States provided information for both summer and winter fuel grades. Sampling in both summer and winter periods ensures representability of the samples taken and is also relevant for the vapour pressure of petrol, for which the FQD sets a limit value of up to 60 kPa [(12)], during the summer period only.

Vapour pressure derogations up to the year 2021 have been granted to eight Member States [(13)] upon their request, either due to the effect of ethanol blending (for Portugal and Spain) or due to low ambient summer temperature (for Denmark, Estonia, Finland, Ireland, Latvia and Sweden) [(14)].

2.3.3 Minimum number of samples

The minimum number of samples specified in EN 14274 refers to the minimum number of samples taken from fuel-dispensing sites to determine fuel quality at the point of use.

For fuel grades with market shares of 10% and above, the minimum number of fuel-dispensing sites that should be sampled and tested in any country is given in Table 2.4.

For each fuel grade with a market share of < 10%, considering petrol and diesel separately, the minimum number of fuel-dispensing sites to be sampled should be calculated in proportion to the number of samples for the corresponding parent grade, using the following equation:

(12) According to Annex I and III of FQD for petrol.

(13) https://ec.europa.eu/clima/policies/transport/fuel_en#tab-0-1.

(14) Guidance note on notifications of exemptions from the vapour pressure requirements for petrol pursuant to Article 3(4) and (5) of Directive 98/70/EC relating to the quality of petrol and diesel fuels (https://ec.europa.eu/clima/sites/default/files/transport/fuel/docs/guidance_note_vapour_pressure_en.pdf).

$$N_{grade\ i} = market\ share_{grade\ i} / market\ share_{parent\ grade} \times N_{parent\ grade}$$

Table 2.4 Minimum number of samples per fuel grade in each winter and summer period

		Statistical model		
Fuel grade	**Country size**	**A**	**B**	**C**
Petrol	Small	50	100	50
Petrol	Large	100	200	N/A
Diesel	Small	50	100	50
Diesel	Large	100	200	N/A

2.4 Exceedances of fuel quality limits

Most key fuel parameters in the samples taken in 2021 were within the tolerance limits. In total, 205 non-compliances for petrol and 77 for diesel were reported for 2021 (Table 2.5).

One Member State (Belgium) reported 92 non-compliances for petrol and 29 for diesel in 2021. Despite this large number of non-compliances, it represents only a small fraction of the overall number of samples taken in Belgium, which is 9 710.

24 Member States reported fewer than 10 non-compliances for petrol, eight of which have reported full compliance (Finland, Ireland, Lithuania, Malta, Netherlands, Romania, Slovenia and Sweden).

Exceedances of the summer vapour pressure were reported in 15 Member States, exceedances of the research octane number (RON) were reported in four Member States (Belgium, Estonia, Latvia, and Portugal), exceedances of the motor octane number (MON) were reported in also four Member States (Belgium, Latvia, Luxembourg and Portugal), exceedances of the aromatics (hydrocarbon analysis) were reported in five Member States (Denmark, Germany, Hungary, Portugal and Spain) and exceedances of the sulphur content were reported in four Member States (Germany, Luxembourg, Poland and Portugal).

26 Member States reported fewer than 10 non-compliances for diesel (all except Belgium), nine of which reported full compliance (Croatia, Cyprus, Ireland, Lithuania, Luxembourg, Netherlands, Poland, Slovakia, and Sweden). Of the seven fuel parameters that require testing and analysis [(15)], the most common parameters falling outside the specifications were the sulphur content (in five Member States) and the FAME content (in 12 Member States), as shown in Table 2.5.

All Member States have described the actions taken when non-compliant samples were identified, except Denmark for two exceedances, one in vapour pressure of petrol fuel grade with min. RON ≥ 98 and one in the FAME content of its diesel fuel grade. These included informing the competent authorities, initiating investigations, imposing penalties and fines or re-sampling. For a small number of cases, no action was taken if the non-compliant parameters were found to be very close to the tolerance limits.

(15) Cetane number, density at 15 ˚C, distillation 95%-point, polycyclic aromatic hydrocarbon (PAH) content, sulphur content, FAME content and manganese content. Note that manganese is a metallic additive used for octane boosting in petrol only. However, the FQD limits the manganese content in all fuels, although it has no application in diesel; hence, most Member States do not routinely test for manganese content in diesel.

Table 2.5 Number of non-compliances for petrol and diesel fuels by country in 2021

Member State	Samples taken (and samples required in brackets)		Number of non-compliances in 2021 (figures for 2020 in brackets)		Parameters outside tolerance limits for non-compliant samples
	Petrol	Diesel	Petrol	Diesel	
Austria	106 (108)	100 (100)	2 (5)	2 (0)	Vapour pressure, Diesel Density at 15 °C, FAME content
Belgium	5 055 (National system)	4 655 (National system)	92 (93)	29 (70)	RON, MON, Vapour pressure, Oxygen content, Ethanol, Diesel Distillation 95%-point, FAME content
Bulgaria	129 (108)	117 (117)	4 (0)	2 (1)	Vapour pressure, Oxygen content, Ethanol, Diesel Density at 15 °C
Croatia	198 (109)	208 (100)	1 (7)	0 (0)	Vapour pressure
Cyprus	465 (110)	257 (100)	3 (2)	0 (1)	Vapour pressure
Czech Republic	1 019 (103)	1 248 (100)	4 (19)	2 (2)	Vapour pressure, FAME content
Denmark	112 (110)	100 (100)	6 (5)	1 (0)	Aromatics, Vapour pressure, FAME content
Estonia	338 (200)	252 (100)	6 (2)	2 (3)	RON, Vapour pressure, Diesel Density at 15 °C
Finland	195 (200)	98 (100)	0 (1)	1 (0)	FAME content
France	457 (411)	227 (202)	18 (10)	8 (3)	Vapour pressure, Oxygen content, FAME content
Germany	858 (829)	415 (400)	6 (22)	2 (2)	Vapour pressure, Ethanol, Aromatics, Sulphur content, FAME Content
Greece	142 (200)	122 (100)	7 (12)	8 (7)	Vapour pressure, Diesel Sulphur content, FAME Content
Hungary	160 (200)	100 (100)	1 (1)	1 (0)	Aromatics, Diesel Sulphur content
Ireland	100 (100)	100 (100)	0 (4)	0 (0)	-
Italy	419 (200)	511 (200)	2 (7)	3 (0)	Distillation - evaporated at 100 °C Distillation - evaporated at 150 °C, Diesel Cetane number, Diesel Sulphur content
Latvia	168 (200)	125 (200)	4 (5)	3 (0)	RON, MON, FAME content
Lithuania	104 (104)	100 (100)	0 (0)	0 (0)	-
Luxembourg	124 (National system)	62 (National system)	9 (0)	0 (0)	MON, Vapour pressure, Sulphur content
Malta	110 (104)	107 (100)	0 (0)	5 (0)	FAME content
Netherlands	100 (103)	100 (100)	0 (0)	0 (0)	-
Poland	599 (436)	425 (400)	1 (4)	0 (0)	Oxygen content
Portugal	254 (110)	270 (100)	32 (15)	1 (0)	RON, MON, Vapour pressure, Aromatics, Methanol, Ethanol, Sulphur content, Diesel Sulphur content
Romania	208 (200)	108 (100)	0 (0)	2 (0)	Diesel Density at 15 °C

Member State	Samples taken (and samples required in brackets)		Number of non-compliances in 2021 (figures for 2020 in brackets)		Parameters outside tolerance limits for non-compliant samples
	Petrol	Diesel	Petrol	Diesel	
Slovakia	231 (200)	216 (100)	1 (6)	0 (0)	Vapour pressure
Slovenia	141 (108)	193 (100)	0 (0)	3 (0)	Diesel Sulphur content, FAME Content
Spain	234 (215)	206 (200)	6 (15)	2 (1)	Vapour pressure, Aromatics, Methanol, FAME content
Sweden	764 (National system)	919 (National system)	0 (0)	0 (0)	-
Total			**205 (235)**	**77 (90)**	

2.5 Quality of Member States' reporting in 2021

The EEA is responsible for the quality assurance/quality control (QA/QC) of the data submitted at EU level and is assisted in these checks by the European Topic Centre for Air Pollution and Climate Change Mitigation (ETC CM).

In 2022, 27 EU Member States plus Iceland, Norway, and Northern Ireland [(16)] submitted their fuel quality reports, in accordance with the requirements of Article 8 of the FQD, for the reference year 2021.

26 countries submitted their first report within the deadline (August 31, 2022). The latest submission was received on 4th of October 2022. No outstanding unresolved issues remain.

During the QA/QC procedure, the ETC CM reviewers posed in total 67 questions to countries, relating to the completeness and consistency of their submitted data sets. The most common findings communicated to countries following the quality checks performed on the information reported were:

- no fuel sales reported in the regional sampling sheets;
- wrong order of magnitude for fuel sales in litres and tonnes;
- national fuel sales and numbers of samples not consistent with the corresponding regional data;
- missing values for various fuel parameters;
- exceedances of certain fuel quality parameters (e.g., summer vapour pressure, sulphur content), without specifying the number of samples outside the tolerance limits or providing any explanations or a description of the action taken;
- analytical and statistical values (e.g., maximum, minimum, median, mean) reported for the full year not consistent with the corresponding summer/winter;
- missing values in case of national limits.

Most of these issues could be solved directly with the countries during the communication process, by their completing missing information, correcting erroneous values or providing the necessary clarifications to comments. Following the QA/QC procedure, 14 countries submitted revised data sets. The last resubmission was received on the 24th of October 2022.

(16) See Withdrawal Agreement including the protocol on Northern Ireland: https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:02020W/TXT-20201218&from=EN

3 Summary of Member States' submissions

3.1 Austria

Country details

Responsible organization:	Umweltbundesamt GmbH Wien (Austrian Environment Agency — AEA)
Country size:	Small
Summer period:	1 May to 30 September
Fuel quality monitoring system (FQMS) used:	EN 14274 statistical model A
Location of sampling:	Refuelling stations / Fuel dispensing sites

Fuel quality monitoring service

Sampling

The organization responsible for sampling is Agrar Market Austria (AMA), analysing and reporting activities are performed by the Austrian Environment Agency (AEA). Samples are taken from filling stations that are selected at random while the proportion of small and large marketers is constant. Within one year three campaigns are undertaken – two in winter (at the beginning and end of the year) and one in summer. All parameters are tested according to the "methods and Limits" sheet.

Fuel Quality Monitoring System administration

The FQM Directive is/was implemented by the formerly Austrian Federal Ministry of Agriculture, Forestry, Environment and Water Management (now BMNT - Federal Ministry of Climate Action, Environment, Energy, Mobility, Innovation and Technology). Both companies, the Agrar Market Austria (AMA) and the Austrian Environment Agency (AEA) are commissioned by the Ministry to perform the FQM in Austria. The samples were taken from the filling stations three times a year (AMA campaigns) and brought to the AEA for analysing. Reporting starts when all samples of the previous year were tested. After analysing the samples, non-compliant fuels are reported to the Ministry where further legal actions are taken.
In the beginning, Austria set up a Model C because the Ministry stated that there is only one company responsible for supplying the Austrian marked and the fuel, therefore, is more or less homogeneous (OMV Refinery) and the FQMS at that time couldn't find evidence that it was different. But in 2009, we shift to the Model A since it could prove that there are two different supplying refineries which deliver Austrian filling stations with fuels – some amounts to come from another Refinery from Germany (OMV Burghausen). The differentiation was possible with the beginning of blending ETBE, and ethanol were for the first-time differences within Austrian fuels sold were detectable. Since then, there are two macro-regions defined (WEST and EAST) and samples taken are split, respecting population and numbers of filling station.

National legislation that transposed the Fuel Quality Directive

The transposition of the FQD in national law, as well as the RED, was done by an amendment of the Austrian Fuel Ordinance which was published in 2012 (BGBl. II Nr. 398/2012).

Reporting periods

There are no arctic weather conditions in Austria. The transition period is defined between the 1st and the 31st of October and between the 1st of March and the 30th of April. Samples taken within the transition periods are regarded as "winter"- samples. They are part of the FQMS.

Sales

Table 3.1 Total sales and sample number

Fuel grade (name)	Biofuel content (% v/v)	Total sales		Samples		Parameters measured
		Litres	Tonnes	Summer	Winter	
Regular unleaded petrol (minimum RON = 91) E5 (Normal)	5.4	11 328 577	8 536	3	0	19 of 19
Unleaded petrol (minimum 95 < RON < 98) E5 (Super)	6.83	1 776 319 897	1 330 046	50	50	19 of 19
Unleaded petrol (minimum RON ≥ 98) E5 (Super Plus)	5.22	135 841 431	101 772	3	0	19 of 19
Total petrol		1 923 489 905	1 440 355	56	50	
Diesel fuel B7 (Diesel)	5.97	7 799 995 232	6 494 276	50	50	6 of 7
Total diesel		7 799 995 232	6 494 276	50	50	

Exceedances of the fuel quality limits

Petrol fuel grades

Table 3.2 summarize the parameter for which exceedances were reported for petrol fuels.

Table 3.2 Unleaded petrol (minimum 95 < RON < 98) E5 (Super)

Parameter	Unit	Limit value	Minimum value measured	Maximum value measured	Number of samples outside tolerance limit	Total number of samples
Vapour Pressure, DVPE	kPa	< 60	56.6	83.6	2	100

Diesel fuel grades

Table 3.3 summarizes the parameters for which exceedances were reported for the diesel fuel grades measured.

Table 3.3 Diesel fuel B7 (B7)

Parameter	Unit	Limit value	Minimum value measured	Maximum value measured	Number of samples outside tolerance limit	Total number of samples
Density at 15 ˚C	kg/m^3	> 820	818.9	839.3	1	100
FAME content	% v/v	< 7	0	8.3	1	100

3.2 Belgium

Country details

Responsible organization:	Fapetro
Country size:	Small
Summer period:	1 May to 30 September
FQMS used:	National system
Location of sampling:	Refuelling stations and terminals

Fuel quality monitoring service

Sampling

The NBN ISO EN 17020 certified organization, Fapetro, is responsible for the reporting of the fuel quality in Belgium. Samples are taken at refuelling stations, depots, and pumps with private owners. Only samples for refuelling stations and depots are reported here. Petrol at depots is not taken due to blending issues.
Belgium is willing to provide further detailed information, used procedures, analysis etc. at any time. The partition of taken samples is adapted to the volume of fuel sold on the Belgian market.
Belgium controls a lot more parameters than imposed by the European Commission to ensure the quality of the sold fuel and to protect the customer. A template can be obtained, showing in detail the analysed parameter and method, standard for every fuel type.
Belgium uses the NBN EN ISO 4259-2 standard for the interpretation of the analysis results from 1 January 2009. Samples were taken in compliance with NBN EN ISO 14275 and NBN ISO 3170, latest version.
All the samples are analysed by laboratories that are NBN EN ISO 17025 certified. All the used test methods are accredited or the demand for accreditation is in progress.
Fapetro also conducts yearly audits in the laboratories to reassure itself of the quality of the reported analysed samples. Pump labelling is regulated by national legislation. Requirements and test methods are described in the following standards: NBN EN 228 for petrol and NBN EN 590 for diesel.

Fuel quality monitoring system administration

All the information can be found in the answer above and procedures on demand.

National legislation that transposed the Fuel Quality Directive

Transposition in national law was affected by the Ministerial decree from 24 January 2002, latest version and need to be seen in relation with the ISO 17020 procedures of Fapetro.

Reporting periods

Seasonal periods in Belgium are as follows:

- summer: from 1 May to 30 September,
- winter: from 1 January to 31 March and 1 November to 31 December.

Transition periods are defined as being the months of October and April.
Regarding the results provided for petrol, Fapetro wants to draw special attention to the Belgian annex of the NBN EN ISO 228 mainly for the parameter vapour pressure.
National specifications for the vapour pressure are:

- in summer (kPa): min 45.0 - max 60.0,
- in winter (kPa): min 65.0 - max 95.0,
- 2 transition periods: the months April and October (kPa): min 45.0 - max 95.0.

The ministerial ruling of 24 January 2002 approving the internal regulations of the Management Committee of the Petroleum Products Analysis Fund describes the operation of the Fapetro Fund. Detailed information about our EN ISO 17020 accredited organization can be provided, on demand.

Sales

Table 3.4 Total sales and sample number

Fuel grade (name)	Biofuel content (% v/v)	Total sales		Samples		Parameters measured
		Litres	Tonnes	Summer	Winter	
Unleaded petrol (minimum 95 < RON < 98) E10 (E10)	9.8	2 082 399 059	1 551 387	1 650	669	19 of 19
Unleaded petrol (minimum RON ≥ 98) E5 (E5)	5.96	566 620 865	422 133	1 629	684	19 of 19
Total petrol		2 649 019 924	1 973 520	3 279	1 353	
Diesel fuel B7 (B7)	6.83	7 051 395 539	5 873 812	1 314	2 721	7 of 7
Diesel fuel B+ (B+)	9.03	122 448 347	101 999	6	26	7 of 7
Total diesel		7 173 843 886	5 975 812	1 320	2 747	

During the QA/QC procedure, Belgium clarified that the biofuel content of the two petrol fuel grades is calculated as follows:

E10	% Ethanol equivalent	E5	% Ethanol equivalent
Bioethanol	9.75	Bio-ETBE	4.09
Bio-naphta	0.05	Bio-MTBE	1.37
		Bio-naphta	0.50
Sum	9.80	Sum	5.96

And that the share of FAME is as described in Table 3.4.

Exceedances of the fuel quality limits

Petrol fuel grades

Table 3.5 and Table 3.6 summarize the parameters for which exceedances were reported for petrol fuels.

Table 3.5 Unleaded petrol (minimum 95 < RON < 98) E10 (E10)

Parameter	Unit	Limit value	Minimum value measured	Maximum value measured	Number of samples outside tolerance limit	Total number of samples
Research octane number	-	> 95	88.2	99.8	2	325
Motor octane number	-	> 85	80.5	88.7	1	2 319
Vapour pressure, DVPE	kPa	< 60	48.3	90.4	68	1 650
Oxygen content	% m/m	< 3.7	1.5	5.0	7	2 319

Table 3.6 Unleaded petrol (minimum RON ≥ 98) E5 (E5)

Parameter	Unit	Limit value	Minimum value measured	Maximum value measured	Number of samples outside tolerance limit	Total number of samples
Research octane number	-	> 95	88.3	100.0	2	663
Motor octane number	-	> 85	81.3	90.0	1	2 313
Oxygen content	% (m/m)	< 2.7	1.5	3.1	5	2 313

Diesel fuel grades

Table 3.7 and Table 3.8 summarize the parameters for which exceedances were reported for the diesel fuel grades measured.

Table 3.7 Diesel fuel B7 (B7)

Parameter	Unit	Limit value	Minimum value measured	Maximum value measured	Number of samples outside tolerance limit	Total number of samples
Distillation 95% point	˚C	< 360	315.5	396.1	12	4 035
FAME content	% v/v	< 7	0.05	9.6	16	4 034

Table 3.8 Diesel fuel B+ (B10)

Parameter	Unit	Limit value	Minimum value measured	Maximum value measured	Number of samples outside tolerance limit	Total number of samples
FAME content	% v/v	< 7	5.4	10.1	1	32

3.3 Bulgaria

Country details

Responsible organization:	Ministry of Environment and Water, State Agency for Metrology and Technical Surveillance of the Ministry of Economy
Country size:	Small
Summer period:	16 April to 15 October
FQMS used:	EN 14274 statistical model A
Location of sampling:	Refuelling stations and terminals

Fuel quality monitoring service

Sampling

The Directorate-General for Quality Control of Liquid Fuels (DG QCLF) staff inspects liquid fuels in a refinery, petroleum depots and terminals, refuelling stations and road tankers for liquid fuels transport.

In fulfilment the requirements of standard BDS EN 14274 were planned minimum 120 locations for inspection to provide 50 petrol samples and 50 diesel fuel samples during the summer and the winter period. The number of samples of petrol RON >= 98 was calculated by means of a formula, according to BDS EN 14274, where the market share of petrol RON >= 98 for 2021 was 7.73%.

The locations were chosen by regions, proportionally determined depending on the annual fuels consumption in a region, on a random basis, from the locations' database. Each location has a unique identification number.

Liquid fuels samples were collected every week, according to the requirements of standards BDS EN ISO 3170 and BDS EN 14275. Testing samples taken for liquid fuels quality control, in accordance with the requirements of standard BDS EN 14274, was performed only in the accredited permanently sited laboratory by set of parameters pursuant to the European Directive 98/70/EC and methods determined in standards BDS EN 228 and BDS EN 590.

The full scope of accreditation of DG QCLF laboratories is available on the link:

- In English: https://www.nab-bas.bg/en/registers/laboratoriya-za-izpitvane-na-goriva-smazochni-materiali-i-prisadki-pri-glavna-direktsiya-kontrol-na-kachestvoto-na-technite-goriva-kam-damtn-35-li-11328.html,
- In Bulgarian: https://www.nab-bas.bg/registar/laboratoriya-za-izpitvane-na-goriva-smazochni-materiali-i-prisadki-pri-glavna-direktsiya-kontrol-na-kachestvoto-na-technite-goriva-kam-damtn-35-li-11328.html.

Fuel quality monitoring system administration

Responsible organizations for management and implementation of the FQD are the Ministry of Environment and Water and the State Agency of Metrological and Technical Surveillance (SAMTS) – Directorate-General for "Quality control of Liquid Fuels" (DG QCLF).

Directorate General "Quality control of liquid fuels" of SAMTS takes samples of transport and heating liquid fuels, and the Executive Agency "Maritime administration" takes samples from vessels and send them for testing in an accredited laboratory. Control is carried out by inspections of the quality of distributed fuels, inspections of their accompanying documents and by imposing administrative measures when infringements are established.

The Bulgarian monitoring system was created with the help of the European standard BDS EN 14274:2003 for small size country. Until 2014, the statistical model B was used and from 2015 the statistical model A is used instead.

DG QCLF is a public body responsible to take actions where non-conformities are found concerning the liquid fuels' control carried out. Periodically, the DG QCLF provides data on the SAMTS website on the

number of inspections, the number of non-compliance cases, the number, and the type of imposed administrative measures taken for the reference period.
Source of information on the consumption of fuels in the country and by regions is the National Revenue Agency.
Bulgaria provides Annual Fuel Quality Monitoring Data Report by the 31st of August.

National legislation that transposed the Fuel Quality Directive

The European legislation for the liquid fuel quality was introduced in the Bulgarian legislation by the Clean Ambient Air Act, The Law of Renewable Energy Sources, as well as by the Regulation on the liquid fuel quality requirements, conditions, order, and way of their control. The Clean Ambient Air Act and the Regulation on the liquid fuel quality requirements, conditions, order, and way of their control introduced the requirements of EN 228 and EN 590. The Law of Renewable Sources sets minimum requirements for blending transport liquid fuels with biocomponent. According to Article 47 of the Law of Renewable Energy Sources, persons who place on the market liquid fuels are obliged on release for consumption to provide diesel fuel with minimum 6% (v/v) biodiesel and minimum 1% by volume of biodiesel to be a new generation biofuel and petrol with minimum 9% (v/v) content of bioethanol or ethers, produced from biomass).

Reporting periods

Seasonal periods in Bulgaria are as follows:

- summer: from 16 April to 15 October;
- winter: from 16 October to 15 April.

With the Regulation on the liquid fuels quality requirements, conditions, order, and way of their control were introduced transition periods for petrol and diesel:

- winter-summer transition period from 16 April to 31 May;
- summer-winter transition period from 16 October to 30 November;

Results included in the Report are for samples taken and tested in the summer and winter periods, apart from three samples of petrol RON 95 and four samples of diesel fuel, taken in a transition period from petroleum depots, because in Bulgarian legislation there are no transition periods for manufacturers and importers concerning seasonal specifications of fuels.

Sales

Table 3.9 Total sales and sample number

Fuel grade (name)	Biofuel content (v/v%)	Total sales		Samples		Parameters measured
		Litres	Tonnes	Summer	Winter	
Unleaded petrol (minimum 95 < RON < 98) E10 (Unleaded petrol RON 95 E10)	10.0	589 043 778	441 783	60	57	19 of 19
Unleaded petrol (minimum RON ≥ 98) E10 (Unleaded petrol RON ≥ 98 E10)	10.0	49 330 979	36 998	6	6	19 of 19
Total petrol		638 374 757	478 781	66	63	
Diesel fuel B7 (Diesel fuel B7)	7.0	2 899 530 441	2 464 601	59	58	7 of 7
Total Diesel		2 899 530 441	2 464 601	59	58	

Exceedances of the fuel quality limits

Petrol fuel grades

No exceedances of the petrol fuel quality limits were reported.

Table 3.10 summarizes the parameters for which exceedances were reported for petrol fuels.

Table 3.10 Unleaded petrol (minimum 95 < RON < 98) E10 (Unleaded petrol RON 95 E10)

Parameter	Unit	Limit value	Minimum value measured	Maximum value measured	Number of samples outside tolerance limit	Total number of samples
Vapour pressure, DVPE	kPa	< 60	51.2	61.9	2	60
Oxygen content	% m/m	< 3.7	1.5	> 3.7	1	115
Ethanol	% v/v	7.57	9.93	> 9.0	1	114

Diesel fuel grades

Table 3.11 summarizes the parameter for which exceedances were reported for the diesel fuel grades measured.

Table 3.11 Diesel fuel B7 (Diesel fuel B7)

Parameter	Unit	Limit value	Minimum value measured	Maximum value measured	Number of samples outside tolerance limit	Total number of samples
Density at 15 ˚C	kg/m^3	> 845	829	846.3	2	117

3.4 Croatia

Country details

Responsible organization:	Ministry of Economy and Sustainable Development
Country size:	Small
Summer period:	1 May to 30 September
FQMS used:	EN 14274 statistical model C
Location of sampling:	Refuelling stations and terminals

Fuel quality monitoring service

Sampling

The fuel quality monitoring system in Croatia is based on the European Standard EN 14274, utilizing the statistical model C (small country) and there is national sampling. Ministry of Economy and Sustainable Development receives annual reports from distributors to the 31st of March of current year for the previous year.

The control and sampling are performed by the legal entity that is certified according to the Croatian Accreditation Agency (ISO/IEC 17020). Analysis of fuel samples is performed by the legal entity that is certified according by the Croatian Accreditation Agency (ISO/IEC 17025).

The samples of petrol fuels, diesel fuel, and gas oil are taken each month during the year at refuelling stations and terminals, according to the "Fuel quality monitoring program" which is under the responsibility of Ministry of Economy and Sustainable Development. Ministry of Economy and Sustainable Development sets out "Fuel quality monitoring program" of current year for the next year. According to the national legislation which transposed the Fuel Quality Directive, the distributors are penalized in case of any exceedance of prescribed fuel quality. Enforcement is under the responsibility of Market Inspection (State Inspectorate, Republic of Croatia). Penalties are included in the Air Protection Law (OG No. 127/19, 57/22). According to the national legislation which transposed the Fuel Quality Directive, the distributors are penalized in case of not submitting data to the National database established by the Ministry of Economy and Sustainable Development. Enforcement is under responsibility of Environmental Inspection (State Inspectorate, Republic of Croatia). Penalties are included in the Air Protection Law (OG No. 127/19, 57/22).

Fuel quality monitoring system administration

Control and sampling – Inspection body type A accredited by norm ISO/IEC 17020 (legal entity that is certified by the Croatian Accreditation Agency); Analysis of fuel samples – Laboratory accredited by norm ISO/IEC 17025 (legal entity that is certified by the Croatian Accreditation Agency); Types of locations at which sampling is carried out – terminals and petrol stations; Samples of petrol fuels, diesel fuel, gas oil and heating oil are taken according to the "Fuel quality monitoring program" which is under the responsibility of Ministry of Economy and Sustainable Development.

Ministry of Economy and Sustainable Development sets out "Fuel quality monitoring program" in the current year for the next year; Frequency of sampling and selection of sampling points in accordance with "Fuel quality monitoring program"; Sampling from Terminals by norm HRN EN ISO 3170; Sampling from petrol stations by norm HRN EN ISO 14275; Determining (analyse) the sulphur content by the norm HRN EN ISO 8754 or 14596.; Reference method used for the precision of the testing method and the interpretation of test results: By the norm HR EN ISO 4259; Number of National refineries: two; Number of distribution terminals: 14;

National legislation that transposed the Fuel Quality Directive

The Fuel Quality Directive (the Directive 98/70/EC, the Directive 2003/17/EC, the Directive 2009/30/EC, the Directive 2011/63/EU, the Directive 2014/77/EC, the Directive (EU) 2015/1513 of the European Parliament, the Council Directive (EU) 2015/652 and the Directive (EU) 2016/802) was transposed into Croatian legislation by the Regulation on the quality of liquid petroleum fuels (Official Gazette No. 131/21).

Reporting periods

Seasonal periods in Croatia are as follows:

- summer: from 1 May to 30 September;
- winter: from 1 October to 30 April

Samples were taken and tested regardless of the transition periods.

In 2021, 406 samples were taken and tested for the purposes of FQMS including 198 samples of petrol (RON 95 and RON 100) and 208 samples of diesel fuel. According to the national legislation which transposed the Fuel Quality Directive, the distributors are penalized in case of any exceedance of prescribed fuel quality. Enforcement is under responsibility of the Market Inspection (State Inspectorate, Republic of Croatia). Penalties are included in the Air Protection Law (Official Gazette No. 127/19, 57/22).

According to the national legislation which transposed the FQM Directive, the distributors are penalized in the case for not submitting data to the National database established by Ministry of economy and sustainable development. Enforcement is under responsibility of Environmental Inspection (State Inspectorate, Republic of Croatia). Penalties are included in the Air Protection Law (Official Gazette No. 127/19, 57/22).

Sales

Table 3.12 Total sales and sample number

Fuel grade (name)	Biofuel content (% v/v)	Total sales		Samples		Parameters measured
		Litres	Tonnes	Summer	Winter	
Unleaded petrol (minimum RON = 95) (RON=95)	5.0	577 721 707	436 180	87	99	19 of 19
Unleaded petrol (minimum 95 < RON < 98) (RON=98)	5.0	230 798	174			
Unleaded petrol (minimum RON ≥ 98) (RON=100)	5.0	49 958 426	37 719	4	8	19 of 19
Total Petrol		627 910 931	474 073	91	107	
Diesel fuel B7 (B7)	7.0	2 189 477 068	1 850 108	90	118	7 of 7
Total Diesel		2 189 477 068	1 850 108	90	118	

Exceedances of the fuel quality limits

Petrol fuel grades

Table 3.13 summarizes the parameter for which exceedances were reported for the petrol fuel grades measured.

Table 3.13 Unleaded petrol (minimum RON = 95) E5 (RON = 95)

Parameter	Unit	Limit value	Minimum value measured	Maximum value measured	Number of samples outside tolerance limit	Total number of samples
Vapour pressure	kPa	< 60	51.5	61.9	1	84

Diesel fuel grades

No exceedances of the diesel fuel quality limits were reported.

3.5 Cyprus

Country details

Responsible organization:	Ministry of Energy, Commerce, and Industry
Country size:	Small
Summer period:	16 April to 15 October
FQMS used:	EN 14274 statistical model C
Location of sampling:	Refuelling stations

Fuel quality monitoring service

Sampling

The Ministry of Energy, Commerce, and Industry (MECI) is responsible for sampling, analysis, and reporting. Analysis of samples is conducted by the Mobile Lab of the MECI and the laboratory of Cyprus Petroleum Storage Company (CPSC).

Samples of all fuel grades were taken in the vast majority from petrol stations; also, samples were taken from vehicles and other private installations of large consumers by the Inspectors of the MECI daily. The statistical and analytical results of the 2021 FQMS Report, include samples from retail sites. The Mobile Lab of the MECI carried out almost all the tests required for monitoring the fuel quality for 2021, at the petrol stations. The Laboratory of the CPSC conducted several tests, especially for verification purposes and also for parameters that cannot be measured in the mobile lab.

Fuel quality monitoring system administration

The Energy Service of the Ministry of Energy, Commerce and Industry is the competent authority for monitoring the fuel quality of the government of the Republic of Cyprus. Most of the data and analysis included in this report are from samples of petrol and diesel that are taken from retail stations - installations in area under the effective control of the government of the Republic of Cyprus. Samples were taken by the Inspectors of the Ministry from Retail sites (petrol refuelling stations) on a daily surveillance program prepared by the Chief Inspector and/or his Assistant.

Where non-compliant samples are identified, the Chief Inspector who is appointed by the Minister of Energy, Commerce, and Industry, is responsible for forbidding the sale of off-specification fuels from retail sites, or the use of off-specification fuels from private installations/vehicles and for initiating penal prosecution to the person who is responsible for the retail site/installation/ tank. Cyprus is considered as a single region.

The supply-import of petrol and diesel is carried out by four of the six companies and distribution and retail are carried out by the six marketing companies. Cyprus has no refinery.

National legislation that transposed the Fuel Quality Directive

The provisions of the FQD that correspond to the fuel specifications have been transposed into national legislation by Law 148 (I)/2003 as amended by Decrees (KDP) P.I.252/15 plus P.I.200/16, P.I.326/13, P.I.328/13, P.I.6/2014 and P.I.328/21.

Reporting periods

Seasonal periods in Cyprus are as follows:

- summer: from 16 April to 15 October;
- winter: from 16 October to 15 April.

The transition period from summer to winter and vice versa is set to six weeks. Samples are taken and tested during these transition periods. Changes in vapour pressure within the transition periods are monitored (if the results are gradually complied with the seasonal specifications) and reported within the annual fuel quality report. Although samples are taken also in winter period, the results of vapour pressure reported here, refer only to the summer period, as required.

Sales

Table 3.14 Total sales and sample number

Fuel grade (name)	Biofuel content (% v/v)	Total sales		Samples		Parameters measured
		Litres	Tonnes	Summer	Winter	
Unleaded petrol (minimum 95 < RON < 98) E5 (Unleaded Gasoline-Petrol RON 95)	5.0	375 003 654	277 780	123	144	19 of 19
Unleaded petrol (minimum RON ≥ 98) E5 (Unleaded Gasoline-Petrol RON 98)	5.0	37 257 670	27 598	114	100	19 of 19
Unleaded petrol (minimum RON ≥ 98) E10 (Unleaded Gasoline-Petrol RON 100)	5.0	1 194 000	884	3	2	18 of 19
Total Petrol		413 455 324	306 262	240	246	
Diesel fuel B7 (Eurodiesel)	7.0	407 663 033	340 770	139	139	7 of 7
Total Diesel		407 663 033	340 770	139	139	

Exceedances of the fuel quality limits

Petrol fuel grades

Table 3.15 and

Table 3.16 summarize the parameter for which exceedances were reported for the petrol fuel grades measured.

Table 3.15 Unleaded petrol (minimum 95 < RON < 98) E5 (Unleaded Gasoline – Petrol RON 95)

Parameter	Unit	Limit value	Minimum value measured	Maximum value measured	Number of samples outside tolerance limit	Total number of samples
Vapour Pressure, DVPE	kPa	< 60	0	76.3	1	121

Table 3.16 Unleaded petrol (minimum RON ≥ 98) E5 (Unleaded Gasoline – Petrol RON 98)

Parameter	Unit	Limit value	Minimum value measured	Maximum value measured	Number of samples outside tolerance limit	Total number of samples
Vapour Pressure, DVPE	kPa	< 60	0	78.0	2	114

Diesel fuel grades

No exceedances of the diesel fuel quality limits were reported.

3.6 Czech Republic

Country details

Responsible organization:	Ministry of Industry and Trade of the Czech Republic
Country size:	Small
Summer period:	1 May to 30 September
FQMS used:	EN 14274 statistical model C
Location of sampling:	Refuelling stations

Fuel quality monitoring service

Sampling

The System of the Fuel Quality Monitoring has been carried out since 2001 under management and evaluation of control monitoring data by the department of Gas Industry and Liquid Fuels at the Ministry of Industry and Trade of the Czech Republic. Since the Czech Republic´s accession to the European Union in May 2004, the National Fuel Quality Monitoring System was able to accept conditions of the European Control System and to be compatible with its hierarchy. Additionally, it has been developed in accordance with current requirements of FQMS.

The fuel quality monitoring has been conducted in accordance with FQMS of the European standard EN 14274:2013 and its national Czech version ČSN EN 14274:2013 with the use of regional model C, in consistent with the Czech national legislation.

The monitoring system of the fuel quality is coordinated by the Ministry of Industry and Trade of the Czech Republic (MIT) in the whole country. The Czech Trade Inspection Authority (CTIA), which comes under the jurisdiction of the Ministry of Industry and Trade of the Czech Republic, performed the sampling of liquid and gas fuels at service stations, in cooperation with Accredited Inspection and Certification Authority SGS for laboratory testing of all samples, which were used in transport sector over the year 2021. The fuel samples were tested monthly throughout of the year 2021. The controlling process of all fuel samples has been carried out by the last amended the European standards EN 228 + A12017 and EN 590 and also the last amendment of the Czech standard ČSN EN 228:2013 + A12018 and ČSN EN 590:2014.

Fuel quality monitoring system administration

The fuel sampling was performed according to the requirements of national and European legislation and standards of Fuel Quality Monitoring System in generally. The FQMS is used as control system in accordance with the Czech Standard ČSN EN 14274:2013 and together its versions of European Standards EN 228:2012 + A12017 for petrol and EN 590:2013 for diesel, as amended by their national status ČSN EN 228:2013 + A12018 and ČSN EN 590:2014. If the Czech Trade Inspection Authority controller has found out some lack in the fuel quality at the service station, the sale of fuels has been banned until rectification has been done along with the possibility of financial sanction, in accordance with Act No. 311/2006 Coll. for fuels and petrol stations later amended.

The national legislation is transposed by the rules in accordance with the obligations of the FQD Directive. The Czech Trade Inspection Authority (CTIA) is the administrative government institution, which comes under the jurisdiction of the Ministry of Industry and Trade of the Czech Republic.

The collected annual data from the fuel quality monitoring of the previous calendar year (2021) have been provided by the CTIA in form of annual report to the coordinating office - Department of Gas Industry and Liquid Fuels of the Ministry of Industry and Trade of the Czech Republic (MIT). This department of MIT is responsible for corresponding work agenda and for reporting to the European Commission on behalf of the EEA from the Czech Republic. Since the Czech Republic's accession to the European Union in May 2004, the national Fuel Quality Monitoring System was able to accept conditions of the European Control system and to be compatible with its hierarchy. Additionally, it has been developed in accordance with the current

requirements of FQMS. The fuel quality monitoring has been conducted in accordance with FQMS of the European standard EN 14274:2013 and its national Czech version ČSN EN 14274:2013 with the use of regional model C, in consistence with the Czech national legislation and Czech standards for petrol and diesel, and their final amendment versions.
Currently, there are two refineries and around 13 distribution terminals in Czech Republic, this has not changed. Data of annual fuel analyses were taken from the service stations after analysing in the Accredited Inspection and Certification Authority SGS for laboratory testing of all samples of liquid and gas fuels, which were selling at the Czech trade in the previous year (2021). This information of selling at the petrol stations in the whole country is provided by the Department of Data Support and Analyses, Unit of MIT in cooperation with the Czech Statistical Office. (A new deadline has been entered for submitting the final report for the Member States of EU by Directive (EU) 2015/1513, but the Czech Republic doesn´t have any problems with the change).

National legislation that transposed the Fuel Quality Directive
The Directive FQD is transposed by the national legislation in accordance with the continual guidelines of the European legislation. The fuel quality has been monitored by Decree No. 516/2020 Coll. on requirements of fuels and the implementation of other provisions of the Fuel Act. In the sequel combined with the Act for fuels and petrol stations No. 311/2006 Coll., later amended, in accordance with Trade Licensing Act No. 455/1991 Coll., as amended and Act No. 353/2003 Coll on Excise Duties as amended, and next Acts like Air Protection Act No. 201/2012 Coll later amended and the national legislation for energy, too.
The Ministry of Industry and Trade of the Czech Republic is responsible for the implementation of Directive 2009/30/EC, amending Directive 98/70/EC as regards the specification of petrol, diesel and gas-oil and introducing a mechanism to monitor and reduce emissions of greenhouse gas as subsequently amended and coordination of all work at the national level monitored in the year 2021, which is shown in details in the tabular requirements of this form/template for reporting to the European Commission.

Reporting periods
Seasonal periods in Czech Republic are as follows:

- summer: from 1 May to 30 September;
- winter: from 1 October to 30 April.

In 2021, 2 611 samples were checked with including alternative fuels at the service stations in the whole country. In total number of the basic fuel type grade samples, 2 257 samples were checked plus five samples of in wintertime. There were checked 474 samples of petrol and 686 samples of diesel in summertime and 541 samples of petrol and 656 samples of diesel plus five samples of artic diesel in wintertime or in similar winter conditions. The results of sampling of the transition periods have been included in two basic seasonal periods – in the spring and in the fall.

Sales

Table 3.17 Total sales and sample number

Fuel grade (name)	Biofuel content (% v/v)	Total sales		Samples		Parameters measured
		Litres	Tonnes	Summer	Winter	
Unleaded petrol (minimum RON = 95) E5 (BA-95)	5.38	1 952 099 000	1 465 050	444	517	19 of 19
Unleaded petrol (minimum RON ≥ 98) E5 (BA-98 E5)	4.86	50 811 000	38 200	26	21	19 of 19
Unleaded petrol (minimum RON ≥ 98) E10 (BA-98 E10)	8.75	16 741 000	12 700	4	3	19 of 19
Unleaded petrol (minimum RON ≥ 98) E+ (E85)	76.3	64 000	50	0	0	0 of 19
Total Petrol		2 019 715 000	1 516 000	474	541	
Diesel fuel B7 (Motorova nafta)	6.40	6 125 824 000	5 112 000	589	658	7 of 7
Total Diesel		6 125 824 000	5 112 000	589	658	

Exceedances of the fuel quality limits

Petrol fuel grades

Table 3.18 summarizes the parameter for which exceedances were reported for the petrol fuel grades measured.

Table 3.18 Unleaded petrol (minimum RON = 95) E5 (BA-95)

Parameter	Unit	Limit value	Minimum value measured	Maximum value measured	Number of samples outside tolerance limit	Total number of samples
Vapour pressure, DVPE	kPa	< 60	0	68.8	4	444

Diesel fuel grades

Table 3.19 summarizes the parameter for which exceedances were reported for the diesel fuel grades measured.

Table 3.19 Diesel fuel B7 (Motorova nafta)

Parameter	Unit	Limit value	Minimum value measured	Maximum value measured	Number of samples outside tolerance limit	Total number of samples
FAME content	% v/v	< 7	0.3	9.3	2	1 247

3.7 Denmark

Country details

Responsible organization:	Danish Environmental Protection Agency
Country size:	Small
Summer period:	1 June to 31 August
FQMS used:	EN 14274 statistical model C
Location of sampling:	Refuelling stations

Fuel quality monitoring service

Sampling
Sampling and analysis were carried out by an accredited laboratory for the Danish Petroleum Association (DD). The results are sent to the Danish Environmental Protection Agency (EPA). The laboratory, where the tests are carried out, is accredited according to EN 14274 and EN 14275 standards.
Samples were taken from service stations. Sampling is carried out three times a year: in spring, summer, and autumn. About 50% of the samples are taken east of, and 50% west of, the Great Belt. The populations east and west of the Great Belt are approximately equal.
The laboratory sends a proposal to sampling places for approval by the Danish EPA. The Danish EPA makes sure that sampling takes place at all petrol companies and all over the country.

Fuel quality monitoring system administration
Sampling and analysis were carried out by an accredited laboratory of the EOF. Results are sent to the Danish EPA. The Danish EPA is responsible for reporting fuel quality in accordance with the FQD and for acting in case of non-compliance. Denmark is a small sized country, using statistical model C. Denmark is considered one region.
There are 18 terminals and two refineries in Denmark. Some samples are not analysed for RON, MON, oxygen and oxygenates, because of their little impact on the environment, and lead (lead has not been added to Danish petrol for many years.

- More than 99% of the fuels used for road transport in Denmark are distributed from two Danish refineries or from terminals owned by members of the DD, and these should meet the DD specifications. These specifications are in accordance with DS/EN 228 for petrol and DS/EN 590 for diesel and the current Danish Statutory Order regarding the quality of petrol and diesel fuel.
- More than 99% of the fuels used for road transport in Denmark are delivered from terminals that are certified in accordance with ISO 9000 or equivalent quality management systems.
- More than 99% of the fuels used for road transport in Denmark are distributed from terminals where 'Certificates of Quality' exist for every import/batch approved according to DS/EN 228 for petrol or DS/EN 590 for diesel and the current Danish Statutory Order regarding the quality of petrol and diesel.
-

National legislation that transposed the Fuel Quality Directive
Part of the Directive is implemented in Danish Statutory Order No 1024 of 23 August 2017.

Reporting periods
Seasonal periods in Denmark are as follows:

- summer: from 1 June to 31 August;
- winter: from 1 September to 31 May.

Denmark has been granted a Vapour Pressure Waiver – until the end of 2030 – because of the low ambient summer temperature (for more detail, see C(2021) 6024 final). Samples taken during the transitional periods (spring and autumn) cover the winter period. Samples are not taken during the transition period.

Sales

Table 3.20 Total sales and sample number

Fuel grade (name)	Biofuel content (% v/v)	Total sales		Samples		Parameters measured
		Litres	Tonnes	Summer	Winter	
Regular unleaded petrol (minimum RON = 91) E10 (Oktan 92 unleaded)	10.0	15 913 000	11 935	1	1	19 of 19
Unleaded petrol (minimum RON = 95) E10 (Oktan 95 unleaded)	10.0	1 574 342 000	1 180 757	50	50	19 of 19
Unleaded petrol (minimum RON ≥ 98) E5 (Oktan 98+ unleaded)	5.0	137 814 000	103 361	4	6	19 of 19
Total Petrol		1 728 069 000	1 296 053	55	57	
Diesel fuel B7 (Diesel B7)	7.0	3 169 138 000	2 662 076	50	50	6 of 7
Total Diesel		3 169 138 000	2 662 076	50	50	

Exceedances of the fuel quality limits

Petrol fuel grades

Table 3.21 and Table 3.22 summarize the parameters for which exceedances were reported for the petrol fuel grades measured.

Table 3.21 Unleaded petrol (minimum RON = 95) E10 (Oktan 95 unleaded)

Parameter	Unit	Limit value	Minimum value measured	Maximum value measured	Number of samples outside tolerance limit	Total number of samples
Aromatics	% V/V	< 35	22.5	39.9	5	100

Table 3.22 Unleaded petrol (minimum RON ≥ 98) E5 (Oktan 98+ unleaded)

Parameter	Unit	Limit value	Minimum value measured	Maximum value measured	Number of samples outside tolerance limit	Total number of samples
Vapour pressure	kPa	< 70	67.4	76.7	1	4

Diesel fuel grades

Table 3.23 summarizes the parameter for which exceedances were reported for the diesel fuel grades measured.

Table 3.23 Diesel fuel B7 (Diesel B7)

Parameter	Unit	Limit value	Minimum value measured	Maximum value measured	Number of samples outside tolerance limit	Total number of samples
FAME content	% v/v	< 7	0.15	7.6	1	100

3.8 Estonia

Country details

Responsible organization:	Estonian Environmental Research Centre (Ministry of Environment)
Country size:	Small
Summer period:	1 Juneto 30 September
FQMS used:	EN 14274 statistical model C
Location of sampling:	Refuelling stations

Fuel quality monitoring service

Sampling
Sampling is done according to standard EN 14275 by Estonian Environmental Research Centre, which is also responsible for analysis and reporting of results. Samples are taken only from retail fuel stations. Sampling points are selected so that most of the refuelling stations are covered within the period of two years. Frequency of sampling is done the way that summer/winter period samples are evenly distributed through the respective period.

Fuel quality monitoring system administration
The Estonian Ministry of Environment is responsible for managing and implementing the FQD. Fuel sampling and analysis are contracted privately with the Estonian Environmental Research Centre and annual report deadline is in the middle of June. When non-compliant samples occur, the public body responsible for acting is the Estonian Tax and Customs Board. This public body is informed immediately by e-mail. If necessary, new samples are taken by Tax and Customs Board. The system has been designed in 2004-2005, using EN 14274 model C.
In Estonia, no national refineries exist, but six (6) distribution terminals for gasoline and diesel fuel and three for liquified gas.

National legislation that transposed the Fuel Quality Directive
Elements of the FQD requirements are described in national regulation by the Ministry of the Environment (Regulation No 73 of 20 December 2016).

Reporting periods
Seasonal periods in Estonia are as follows:

- summer: from 1 May to 30 September;
- winter: from 1 December to 28/29 February.

A vapour pressure derogation has been granted to Estonia because of the low ambient summer temperature (maximum is 70 kPa) till 31 December 2030 (for more detail, see C(2021) 7494 final). Transition periods are from 1 October to 30 November and from 1 March to 30 April. Samples are taken also during the transition periods, but those results are excluded from reporting FQD.

Sales

Table 3.24 Total sales and sample number

Fuel grade (name)	Biofuel content (% v/v)	Total sales		Samples		Parameters measured
		Litres	Tonnes	Summer	Winter	
Unleaded petrol (minimum 95 < RON < 98) E10 (RON 95)	4.39	156 881 797	116 093	75	58	19 of 19
Unleaded petrol (minimum RON ≥ 98) E5 (RON 98)	1.07	124 771 884	92 331	75	54	19 of 19
Total Petrol		281 653 681	208 424	150	112	
Diesel fuel B7 (B7)	5.59	922 954 408	766 052	110	74	7 of 7
Total Diesel		922 954 408	766 052	110	74	

Exceedances of the fuel quality limits

Petrol fuel grades

Table 3.25 and Table 3.26 summarize the parameters for which exceedances were reported for the petrol fuel grades measured.

Table 3.25 Unleaded petrol (minimum 95 < RON < 98) E10 (RON 95)

Parameter	Unit	Limit value	Minimum value measured	Maximum value measured	Number of samples outside tolerance limit	Total number of samples
Vapour pressure, DVPE	kPa	< 70	58.4	86.9	1	133

Table 3.26 Unleaded petrol (minimum RON ≥ 98) E5 (RON 98)

Parameter	Unit	Limit value	Minimum value measured	Maximum value measured	Number of samples outside tolerance limit	Total number of samples
Research Octane Number	--	> 98	96.1	99.3	4	129
Vapour pressure, DVPE	kPa	< 70	58.5	86.7	1	129

Diesel fuel grades

Table 3.27 summarizes the parameter for which exceedances were reported for the diesel fuel grades measured.

Table 3.27 Diesel fuel B7 (Diesel B7)

Parameter	Unit	Limit value	Minimum value measured	Maximum value measured	Number of samples outside tolerance limit	Total number of samples
Density at 15 ˚C	kg/m^3	> 800	798.6	840	2	184

3.9 Finland

Country details

Responsible organization:	Finnish Customs Laboratory
Country size:	Small
Summer period:	1 June to 31 August
FQMS used:	EN 14274 statistical model A
Location of sampling:	Refuelling stations

Fuel quality monitoring service

Sampling

Finnish Customs oversees the practical realization of the supervision. The Customs' national organization takes fuel samples according to the sampling plan, which is approved by the Ministry of the Environment for each monitoring year. The samples are analysed at the Customs Laboratory or by subcontractors whose competence has been confirmed. The Finnish Customs also compiles the report and forwards it to the Ministry of the Environment for final approval and delivery.

Sampling is done in the whole country according to the sampling plan following the guidelines of the standard EN 14274:2013 model A. The country has been divided into three macro-regions with about the same sales volumes and variability factors. There are two refineries and 19 terminals in operation. The number of retail sites in macro-regions 1, 2 and 3 are about 650, 750 and 460 respectively, making a total of about 1 860. The sampling places are selected randomly, however, ensuring that all distribution chain companies are included. All samples are taken at retail sites.

The grades investigated are unleaded RON 95 E10 and RON 98 E5 sulphur free (max. 10 mg/kg) petrol and sulphur free (max. 10 mg/kg) diesel fuel. The fuels were, furthermore, divided into summer and winter grade. Since the sales, for RON 99 octane petrol is small (less than 2% in 2018) it was excluded from the actual sampling. In addition, there was no quality under RON 95 octane on the market.

The sampling aims to comply, when applicable, with the requirements of standard EN 14275:2013. The sampling is done by trained personnel. One-litre metal containers and five litre plastic containers approved for this purpose are used as sampling containers. Before the vapour pressure analysis for petrol samples, the sampling containers are cooled according to the requirements of the method.

The **analyses** are conducted at the Customs Laboratory, which is a testing laboratory accredited by FINAS Accreditation Service. In 2021, subcontractors were used for octane numbers (EN ISO 5164:2014 and EN ISO 5163:2014 methods) of petrol and cetane number (EN ISO 5165:2020 method) of diesel. Except for the lead, manganese and FAME methods, all methods of analysis used (including those subcontracted) were reference methods according to the standards EN 228 and EN 590. Sulphur of petrol and diesel (standard EN ISO 20846:2019), density of diesel (standard EN ISO 12185:1996), vapour pressure of petrol (standard EN 13016-1:2018) and aromatics, olefins, benzene, oxygenates and oxygen contents of petrol (standard EN ISO 22854:2016) methods have been accredited by FINAS Accreditation service. Other methods used by the laboratory have been tested and validated according to quality procedure of customs laboratory. These test methods are distillation of petrol and diesel (standard EN ISO 3405:2019), and polycyclic aromatics content of diesel (standard EN 12916:2019). FAME method is based on ATR technique. If needed, the laboratory can confirm the FAME content of the sample with the EN 14078 method. The lead method used by the laboratory (determination of lead content in petrol by energy dispersive X-ray fluorescence spectroscopy) is a so-called screening method. The sensitivity of the method used, however, is better than the limit indicated in the quality requirements. The average lead content measured in the samples was clearly below the limit set in the quality requirements. If needed, the laboratory can confirm the lead content of the sample with the EN 237 method according to the Directive (Petroleum products. Petrol. Determination of low lead concentrations by atomic absorption spectrometry) in cases where the

result is near or exceeds the quality limit. Manganese content of petrol was also examined by energy dispersive X-ray fluorescence spectroscopy. The laboratory has the ability to confirm the manganese content with the EN 16136 method if necessary. The authenticity accuracy and reproducibility value R of the methods used by the laboratory have been verified by the national Round Robin and international PT comparative studies.
In 2021, the Customs Laboratory took part in the Round Robin Finland testing, which performs national inter-laboratory fuel examinations and PT tests organized by IIS (Institute for Interlaboratory Studies). The results of the parameters measured in the tests (sulphur, density, distillation, FAME content, vapour pressure, lead, manganese, aromatics, olefins, benzene, oxygenates and total oxygen) were acceptable. In 2001 – 2020, the laboratory has also taken part in these tests with acceptable results.

Fuel quality monitoring system administration
The Ministry of the Environment is responsible for transposition of the Directive into the national legislation, approving annual sampling plans and giving general guidance. Finnish Customs is responsible for the practical implementation and fuel quality monitoring as explained above. The Customs Laboratory, for example, analyse the samples. However, subcontractors whose competence has been confirmed can be used.
In case of non-compliant samples, the analyses will be repeated, as soon as possible. If non-compliance is confirmed, the Customs contacts the fuel supplier/oil company to get a detailed account. If clear reason for non-compliance is not found, if there's no signs of intentional offending action, and the case is not a serious one, a written procedure is often considered appropriate and sufficient. When non-compliant samples are repeatedly found, remark or formal complaints may also be given. According to Paragraph 175 (Rectification of a violation or negligence) of the Environmental Protection Act 527/2014 a supervisory authority may prohibit a party from continuing or repeating a procedure violating existing regulations or order a party to fulfil its duty in some other way. Ministry of the Environment is informed about actions taken. If there is a risk that non-compliant fuel can cause damage to the vehicle (lead, sulphur) and the fuel is still on the market, it is possible to order the fuel supplier to remove the product from the market. According to Paragraph 183 (Decision to prohibit or require action on substances, preparations, products, equipment and machines) the Ministry of the Environment may prohibit the manufacturer, importer or other market supplier from continuing operations that are contradicting existing regulations; prohibit the trading, sale or other supply of products that are in violation of the existing regulations; require the offender to bring the product into compliance with the regulations or otherwise meet its obligations. If a product has been placed on the market, the Ministry may require the party acting contrary to the existing regulations to remove the product from the market.

National legislation that transposed the Fuel Quality Directive
In general, the fuel quality monitoring is based on the Environmental Protection Act (527/2014), the Government Decree on the quality requirements for petrol and diesel fuel (1206/2010: amendments 797/2015 and 1070/2018) and an agreement between the Ministry of the Environment and Finnish Customs (38/481/2001). The Government Decree is the principal transposition act.

Reporting periods
Seasonal periods in Finland are as follows:

- summer: from 1 June to 31 August;
- winter: from 1 September to 31 May.

A "low ambient summer temperature" derogation has been granted in 2022 until 31 December 2030. The summer period is from 1st of June to 31st of August during which the maximum vapour pressure is 70 kPa. For details, see EC decision C(2022) 5591 final.
The sampling is split to winter and summer periods to take minimum sample amount in both periods. Samples are also taken during the transition periods in spring and autumn and the results are reported as part of the annual fuel quality report.

Sales

Table 3.28 Total sales and sample number

Fuel grade (name)	Biofuel content (% v/v)	Total sales*		Samples		Parameters measured
		Litres	Tonnes	Summer	Winter	
Unleaded petrol (minimum RON = 95) E10 (Moottoribensiini 95 E10)	Max. 10.0	100 383 000	945 493	47	52	19 of 19
Unleaded petrol (minimum RON ≥ 98) E5 (Moottoribensiini 98 E5)	Max. 5.0	34 094 000	369 368	46	50	19 of 19
Total petrol		134 477 000	1 314 861	93	102	
Diesel fuel B7 (Dieselöljy)	Max. 7.0	238 898 000	2 459 263	45	53	6 of 7
Total diesel		238 898 000	2 459 263	45	53	

*Figures are for 2020 and are based on information of Central Statistical Office of Finland. There is no statistical information for national sales total figures for 2021 available in Finland (information provided by Finland).

Exceedances of the fuel quality limits

Petrol fuel grades

No exceedances of the petrol fuel quality limits were reported.

Diesel fuel grades

Table 3.29 summarize the parameter for which exceedances were reported for the diesel fuel grades measured.

Table 3.29 Diesel fuel B7 (Dieselöljy)

Parameter	Unit	Limit value	Minimum value measured	Maximum value measured	Number of samples outside tolerance limit	Total number of samples
FAME content	% V/V	< 7	0	10.8	1	98

3.10 France

Country details

Responsible organization:	Ministère de la Transition Energétique
Country size:	Large
Summer period:	May 1 to September 30
FQMS used:	EN 14274 statistical model A
Location of sampling:	Refuelling stations

Fuel quality monitoring service

Sampling

The service provider who carried out the sampling and analyses in 2021 on behalf of the General Directorate for Energy and Climate (DGEC) is the company SGS FRANCE selected by a new European call for tenders, launched in 2018 for cover the period 2019 – 2022. The company SGS FRANCE in charge of controls and analyses is audited once a year by the DGEC. The DGEC oversees reporting based on information provided by the service provider. Controls are carried out throughout the national territory and concern petrol (premium fuels) and diesel fuels. They consist of checking, as close as possible to the user, that the regulatory technical characteristics are respected. The control points are the service stations, which are chosen by a draw carried out by the DGEC from a file listing the French service stations, updated each year. The annual control plan now covers 200 samples of SP95 or SP98, 200 diesel samples, 200 samples of SP95-E10 and 34 samples of E85, half in winter and half in summer. Each service station control campaign is spread over the calendar year and is organized into quarterly programs, except from the overseas departments, where the sampling campaign is carried out once a year, due to the absence of seasonality. Samples are taken throughout the year.

Fuel quality monitoring system administration

At the Ministry for Energy Transition, the DGEC (Directorate General for Energy and Climate) is responsible for the application of Directives, relating to the quality of fuels and the sulphur content of marine fuels as well as the implementation of the control system. The service provider that carries out the sampling and analyses on behalf of the DGEC is the company SGS FRANCE, selected by European call for tenders. The public contract was renewed in 2019 for a maximum period of four years, following a European call for tenders launched in 2018. The public contract is to be renewed in 2022. The checks are mainly aimed at verifying the compliance of fuels distributed.

They make it possible to identify deviations, analyse them and have the appropriate corrective measures adopted. Distributors are kept informed of the deviations noted by the DGEC and must provide explanations, as well as corrective and preventive measures. During the measurement campaign (4 per year in mainland France and one in the DROMs), the DGEC may expressly request, in view of the anomalies and non-conformities observed, additional samples and analyses. The Directorate General for Competition, Consumer Affairs and Fraud Prevention (DGCCRF) retains its role of ad hoc intervention and reports violations.

In the event of serious or repetitive deviations, the DGCCRF is formally notified.

Within the meaning of articles 3.2.2 and 5.3.3 of standard NF EN 14274, France is classified as a large country and now uses model A.

The regions controlled are five macro-regions: Normandy-Ile of the France Zone, North-East Zone, South Zone, South-West Zone and West Zone and the overseas departments (DOM): Martinique, Guadeloupe, Guyana, La Reunion, and Mayotte.

In 2021, France had eight refineries in operation (seven in mainland France and one in Martinique) and a biorefinery in La Mède. In 2021, the Grand Puits refinery was closed to convert it into a biorefinery.

As of January 1, 2021, France has approximately 183 civil oil depots with a capacity of more than 400 m³ distributing fuels and combustibles, and approximately 11,000 service stations, in mainland France.

National legislation that transposed the Fuel Quality Directive

The fuel quality requirements, as laid down in the amended Fuel Quality Directive 2009/30/EC, have been transposed into ministerial decrees relating to the fuel characteristics (one decree for each fuel) and decisions laying down the methods of determining the fuel efficiency tests related to these characteristics. Ministerial Orders and Decisions are amended as necessary with each development of Directive 98/70/EC.

Reporting periods

Seasonal periods in France are as follows:

- summer: from 1 May to 30 September;
- winter: from 1 October to 30 April

For petrol, the transition periods are from 16 March to 30 April and from 1 to 31 October. Regarding diesel, there is no transition period. In general, samples are not analysed in April and October.

In 2021, following the Covid-19 epidemic, containment measures were put in place and led to sharp drops in fuel consumption which impacted the entire supply chain, and did not allow a passage to summer quality for 1st of May. In order not to block all oil logistics, France, in agreement with the EC, issued two derogatory decrees authorizing, on an exceptional and temporary basis, distributors to hold and market until 31st of May 2021, a premium unleaded fuel and a premium unleaded 95-E10 (SP95-E10) whose volatility characteristics were in line with those of the D1 + A off-season. The switch to summer specifications for France was, therefore, able to be staggered until the 1st of June. No summer gasoline quality control has been scheduled before the 1st of June 2021.

Sales

Table 3.30 Total sales and sample number

Fuel grade (name)	Biofuel content (% v/v)	Total sales		Samples		Parameters measured
		Litres	Tonnes	Summer	Winter	
Unleaded petrol (minimum RON = 95) E5 (SP95/SP98)	5.00	5 483 498 000	4 140 041	120	104	19 of 19
Unleaded petrol (minimum RON = 95) E10 (SP95-E10)	10.00	6 042 383 000	4 561 999	99	100	19 of 19
Unleaded petrol (minimum RON = 95) E+ (E85)	85.00	343 144 000	267 652	20	14	5 of 19
Total Petrol		11 869 025 000	8 969 692	239	218	
Diesel fuel B7 (B7)	7.00	36 587 790 000	30 916 683	120	104	7 of 7
Diesel fuel B+ (B10)	10.00	315 242 000	266 379	2	1	7 of 7
Total Diesel		36 903 032 000	31 183 062	122	105	

Exceedances of the fuel quality limits

Petrol fuel grades

Table 3.31, Table 3.32 and Table 3.33 summarize the parameters for which exceedances were reported for the petrol fuel grades measured.

Table 3.31 Unleaded petrol (minimum RON = 95) E5 (SP95/SP98)

Parameter	Unit	Limit value	Minimum value measured	Maximum value measured	Number of samples outside tolerance limit	Total number of samples
Vapour Pressure, DVPE	kPa	< 60	49.4	62.6	6	120

Table 3.32 Unleaded petrol (minimum RON = 95) E10 (SP95-E10)

Parameter	Unit	Limit value	Minimum value measured	Maximum value measured	Number of samples outside tolerance limit	Total number of samples
Vapour pressure, DVPE	kPa	< 60	56.2	65.7	10	99
Oxygen content	% m/m	< 3.7	2.35	4.52	2	199

Table 3.33 Unleaded petrol (minimum RON = 95) E10 (SP95-E10)

Parameter	Unit	Limit value	Minimum value measured	Maximum value measured	Number of samples outside tolerance limit	Total number of samples
Vapour pressure, DVPE	kPa	< 60	56.2	65.7	10	99
Oxygen content	% m/m	< 3.7	2.35	4.52	2	199

Diesel fuel grades

Table 3.34 summarizes the parameter for which exceedances were reported for the diesel fuel grades measured.

Table 3.34 Diesel fuel B7 (B7)

Parameter	Unit	Limit value	Minimum value measured	Maximum value measured	Number of samples outside tolerance limit	Total number of samples
FAME Content	% v/v	< 7	3.6	9.9	8	224

3.11 Germany

Country details

Responsible organization:	German Environment Agency (Umweltbundesamt)
Country size:	Large
Summer period:	1 May to 30 September
FQMS used:	EN 14274 statistical model B
Location of sampling:	Refuelling stations

Fuel quality monitoring service

Sampling

The organizations responsible for the sampling, analysis and reporting at regional level are the 16 governments of the federal states or their federal state agencies. The authorities and organizations which are involved are listed in detail below. The responsibilities are coded as follows:

(a) control and sampling,
(b) analysis of fuel samples,
(c) enforcement and non-compliance action and
(d) implementation.

1	Baden-Württemberg:	Ministerium für Umwelt, Klima und Energiewirtschaft / Referat 44 (Betrieblicher Umweltschutz, Stofflicher Gefahrenschutz, Geologie, Bergbau)	(d)
		Regierungspräsidium Tübingen / Referat 112 (Produktsicherheit Investitionsgüter, ortsbewegliche Druckgeräte)	(a, c)
		Private laboratory	(b)
2	Bayern:	Bayer. Staatsministerium für Umwelt und Verbraucherschutz	(d)
		Bayer. Landesamt für Umwelt	(c)
		Private laboratory	(a, b)
3	Berlin:	Senatsverwaltung für Umwelt, Verkehr und Klimaschutz	(d, c)
		Private laboratory	(a, b)
4	Brandenburg:	Ministerium für Soziales, Gesundheit, Integration und Verbraucherschutz des Landes BB	(d)
		Landesamt für Arbeitsschutz, Verbraucherschutz und Gesundheit des Landes Brandenburg	(a, c)
		Private laboratory	(b)
5	Bremen:	Die Senatorin für Klimaschutz, Umwelt, Mobilität, Stadtentwicklung und Wohnungsbau der Freien Hansestadt Bremen	(d, a)
		Gewerbeaufsicht des Landes Bremen	(a, c)
		Private laboratory	(a, b)
6	Hamburg:	Behörde für Umwelt, Klima, Energie und Agrarwirtschaft, Amt für Immissionsschutz und Abfallwirtschaft, Referat für Raffinerien, Tankläger und Reinigungsbetriebe	(d, c)
		Private laboratory	(a, b)
7	Hessen:	Hessische Ministerium für Umwelt, Klimaschutz, Landwirtschaft und Verbraucherschutz, Mainzer Straße 80, 65189 Wiesbaden	(d)
		Regierungspräsidium Darmstadt	(c)
		Private laboratory	(a, b)
8	Mecklenburg-Vorpommern:	Ministerium für Landwirtschaft und Umwelt M-V	(d)
		Landesamt für Umwelt, Naturschutz und Geologie M-V	(a, c)

		Staatliche Ämter für Landwirtschaft und Umwelt	(a, c)
		Private laboratory	(a, b)
9	Niedersachsen:	Niedersächsisches Ministerium für Umwelt, Energie, Bauen und Klimaschutz	(d, a)
		Landkreise und kreisfreie- und große selbstständige Städte	(a, c)
		Private laboratory	(a, b)
10	Nordrhein-Westfalen:	Ministerium für Umwelt, Landwirtschaft, Natur- und Verbraucherschutz NRW	(d)
		Untere Immissionsschutzbehörden: Kreise und Kommunen	(c)
		Private laboratory	(a, b)
11	Rheinland-Pfalz:	Ministerium für Klimaschutz, Umwelt, Energie und Mobilität	(d)
		Struktur- und Genehmigungsdirektion Nord sowie Struktur- und Genehmigungsdirektion Süd	(a, c)
		Private laboratory	(b)
12	Saarland:	Ministerium für Umwelt und Verbraucherschutz	(d)
		Landesamt für Umwelt und Arbeitsschutz	(c)
		Private laboratory	(a, b)
13	Sachsen:	Sächsisches Staatsministerium für Energie, Klimaschutz, Umwelt und Landwirtschaft	(d)
		Landesdirektion Sachsen	(a, c)
		Private laboratory	(b)
14	Sachsen-Anhalt:	Ministerium für Umwelt, Landwirtschaft und Energie (Magdeburg)	(d)
		Landesverwaltungsamt Sachsen-Anhalt	(d)
		Landkreise	(a, b, c)
		Private laboratory	(a, b)
15	Schleswig-Holstein:	MELUND (Ministerium für Energiewende, Landwirtschaft, Umwelt, Natur und Digitalisierung des Landes Schleswig-Holstein)	(d)
		LLUR (Landesamt für Landwirtschaft, Umwelt und ländliche Räume des Landes Schleswig-Holstein)	(a, c)
		Private laboratory	(a, b)
16	Thüringen:	Thüringer Ministerium für Umwelt, Energie und Naturschutz	(d)
		Thüringer Landesamt für Umwelt, Bergbau und Naturschutz	(d, a, c)
		Private laboratory	(a, b)

The results of the regional sampling are forwarded to the Umweltbundesamt (German Environment Agency — UBA), where data are collected and subsequently consolidated into a report.
The sampling was carried out at refuelling stations only. The frequency of the sampling is shown on the data sheets.
Selection of the sampling points is the responsibility of each government of the 16 German states. The quality of petrol and diesel fuels is tested by the competent authorities of the federal states. The overall monitoring of fuel quality also falls within the responsibilities of the federal states' competent authorities, which are district administrations, lower administrative authorities, districts and non-district or independent municipalities. The method for selecting fuel stations may be rotation, random selection, or another way, considering population distribution and regional aspects. The test methods used to sample the different parameters are presented on the datasheets.

Fuel quality monitoring system administration

The competent authorities of the federal states monitor the quality of petrol and diesel fuels and are responsible for fuel quality monitoring, in general. These authorities include district administrations, lower administrative authorities, districts, non-district municipalities and independent towns.
DIN EN 14274 (Annex C) lays down that model B applies to Germany (non-macro region): Germany is divided into 16 federal states (Bundesländer) which do not comply with fuel distribution patterns. As Germany is categorized as a large country regarding FQMS, the minimum number of samples is 200 per fuel and period (summer, winter). The share in sampling for the various regions and the resulting number of samples is stipulated in the General Administrative Regulation on the 10th BImSchV, Annex 20. For fuels

with less than 10% market share, DIN EN 14274-2013 defines a smaller number of samples. Please find additional information on the number of samples for fuels with minor market shares for each region at https://www.verwaltungsvorschriften-im-internet.de/pdf/BMU-IGI6-20120904-SF-A020.pdf.
The federal states must convey their results to the Federal Environment Agency until April 30th of the following year, where a general report is produced. The Federal Environment Agency passes this report on to the Federal Ministry for the Environment, Nature Conservation, Nuclear Safety and Consumer Protection and to the European Commission.
The governments of the German states and/or the lower-ranking government agencies are responsible for acting in case of non-compliant samples.
The design of the system was defined in DIN EN 14274-2013. It was adopted into legislation by the German 10th BImSchV in 2008.
By the end of 2021, there were 16 refineries producing petrol and diesel in Germany. The number of refuelling stations in Germany was 14.459, also by the end of 2021.

National legislation that transposed the Fuel Quality Directive
The elements of the Directive are transposed into the German "Tenth Ordinance Implementing the Federal Emission Control Act (Ordinance on the quality and labelling of the qualities of fuels - 10th BImSchV)" i.e., Tenth Ordinance Implementing the Federal Emission Control Act (10th BImSchV) on the link https://www.gesetze-im-internet.de/bundesrecht/bimschv_10_2010/gesamt.pdf"

Reporting periods
Summer, winter, and transition periods are defined by the national annexes of EN 228 and EN 590.
Seasonal periods in Germany are as follows:

- summer: petrol from 1 May to 30 September; diesel from 15 April to 30 September;
- winter: petrol from 16 November to 15 March; diesel from 16 November to 28 February.

Transition periods are as follows:

- Petrol: from 1 October to 15 November and from 16 March to 30 April;
- Diesel: from 1 October to 15 November and from 29 February/1 March to 14 April.

Samples may be taken during the whole year, preferably in the summer or winter period. Transition period samples are excluded in case of petrol and included in case of diesel. The only seasonal parameter in the diesel standard is CFPP which is not reported in the EU-template, thus, does not alter the statistics. For petrol, limit breaches might depend on whether the transition period data is assigned to the summer or winter period. Since this would induce flexibility on the number of limit breaches, the transition period data for petrol is excluded from this report.

Sales

Table 3.35 Total sales and sample number

Fuel grade (name)	Biofuel content (% v/v)	Total sales		Samples		Parameters measured
		Litres	Tonnes	Summer	Winter	
Unleaded petrol (minimum RON = 95) E5 (Super E5)	5.0	17 015 840 000	12 761 880	190	205	19 of 19
Unleaded petrol (minimum RON = 95) E10 (Super E10)	10.0	3 767 910 667	2 825 933	195	212	19 of 19
Unleaded petrol (minimum RON >= 98) E5 (Super Plus)	5.0	1 235 692 000	926 769	28	28	19 of 19
Total Petrol		22 019 442 667	16 514 582	413	445	
Diesel fuel B7 (Diesel)	7.0	41 918 223 810	35 211 308	198	217	6 of 7
Total Diesel		41 918 223 810	35 211 308	198	217	

Exceedances of the fuel quality limits

Petrol fuel grades

Table 3.36 and Table 3.37 summarize the parameters for which exceedances were reported for the petrol fuel grades measured.

Table 3.36 Unleaded petrol (minimum RON = 95) E5 (Super E5)

Parameter	Unit	Limit value	Minimum value measured	Maximum value measured	Number of samples outside tolerance limit	Total number of samples
Vapour pressure, DVPE	kPa	< 61.3	56.9	85.3	1	190
Ethanol	% v/v	< 5.3	0.2	6.1	1	395

Table 3.37 Unleaded petrol (minimum RON = 95) E10 (Super E10)

Parameter	Unit	Limit value	Minimum value measured	Maximum value measured	Number of samples outside tolerance limit	Total number of samples
Vapour pressure, DVPE	kPa	< 61.3	53.7	62.7	1	195
Aromatics	% v/v	< 35	0	36.4	1	407
Sulphur content	mg/kg	< 10	0	12.0	2	407

Diesel fuel grades

Table 3.38 summarizes the parameter for which exceedances were reported for the diesel fuel grades measured.

Table 3.38 Diesel fuel B7 (Diesel)

Parameter	Unit	Limit value	Minimum value measured	Maximum value measured	Number of samples outside tolerance limit	Total number of samples
FAME Content	% v/v	< 7.3	0.05	8.9	2	395

3.12 Greece

Country details

Responsible organization:	General Chemical State Laboratory, Directorate of Energy, Industrial and Chemical Products
Country size:	Small
Summer period:	1 May to 30 September
FQMS used:	EN 14274 Statistical Model A
Location of sampling:	Refuelling stations

Fuel quality monitoring service

Sampling

Greece is classified as a small country under the criteria in Article 3.2 of the ELOT EN 14274 standard considering fuel sales levels. Model A applies to Greece. In this model, to plan fuel sampling activities, the country is divided into three geographical regions:

- Region A consists of Attica,
- Region B includes Thessaly, Macedonia, Epirus, Thrace, and Thessaloniki,
- Region C includes Central Greece, Evia, the Ionian Islands, the Peloponnese, Crete, and the Aegean Islands.

For Region A the competent body for taking fuel samples is the Fuel Distribution and Storage Inspectorate (KEDAK) of the Ministry of the Environment and Energy. For Region B and C, the competent bodies for taking fuel samples are the inspection teams from the competent Chemical Services of the General Chemical State Laboratory working in collaboration with the regional Customs Authorities.

Refuelling stations are used as sampling locations. Sampling locations are chosen at random.

The number of samples to be tested in each period (summer and winter) for each grade of fuel with annual sales accounting for at least 10% of the fuel market are at least 50.

The number of samples to be tested in each period (summer and winter) for each grade of fuel with annual sales accounting for less than 10% of the fuel market are calculated using the following formula:

N(x) = where:

N(x): the number of samples taken from fuel (x) where sales account for less than 10% of the fuel market.

M(x): the share of sales held by fuel (x). [Calculations are made on a rough basis based on past data].

M: the share of sales for the main category of fuel in which fuel (x) belongs.

Based on the sales percentage of various grades of fuels in each region, the Directorate of Energy Industrial and Chemical Products sets the minimum number of fuel samples to be taken from refuelling stations in the area. Optionally, the Directorate of Energy Industrial and Chemical Products may issue a decision requiring that samples taken in each period include fuel samples from each refinery. Care is taken to ensure that samples are taken in a uniform manner across the entire year.

The competent bodies for sampling send the samples to the central fuel inspection laboratories of the General Chemical State Laboratory which are ISO 17025 accredited. The samples received from Regions A and C are examined by the Piraeus Chemical Service while the samples from Region B are examined by the Central Macedonia Chemical Service. The laboratories monitor compliance with the requirements of the Decision No. 316/2010 and Decision No. 77/2016. relating to petrol and diesel fuels, based on analytical methods which are set out in the ELOT EN 228 and ELOT EN 590 standards respectively. The central fuel inspection laboratories send the test results to the competent authorities for sampling and to the Directorate of Energy Industrial and Chemical Products. Where the fuel samples do not meet the specifications, the relevant sanctions shall be imposed by the competent authorities. The Directorate of Energy Industrial and Chemical Products use the results in the sample testing reports for statistical purposes to prepare and submit the annual report to the European Commission.

Fuel quality monitoring system administration

The Competent Authority for the system of monitoring fuel quality (automotive petrol and diesel) is the Directorate of Energy Industrial and Chemical Products of the General Chemical State Laboratory. The system was designed using model A of the ELOT EN 14274 standard considering fuel sales levels. Greek Organization for Standardization (ELOT) has adopted EN 14274 standard without changes. The system was implemented in Greece with the State Supreme Chemical Council Decision No. 316/2010 (Government Gazette 501/B/2012), as amended by the State Supreme Chemical Council Decision No.77/2016 (Government Gazette 4217/B/2016).

Fuel sampling is carried out by public authorities. Where non-compliant samples have been discovered the sampling authority is responsible for acting. Failure to comply with the provisions of the legislation result in the sanctions specified in article 10 of the State Supreme Chemical Council Decision No. 316/2010 (Government Gazette 501/B/2012), as amended by the State Supreme Chemical Council Decision No.77/2016 (Government Gazette 4217/B/2016).

National legislation that transposed the Fuel Quality Directive

Fuel Quality Directive 2009/30 (apart from Articles 7(a) to 7(e) of Directive 98/70/EC, as amended by Article 1 of Directive 2009/30/EC) was transposed into Greek law with State Supreme Chemical Council Decision No 316/2010 (Government Gazette 501/B/2012), as amended by State Supreme Chemical Council Decision No 77/2016 (Government Gazette 4217/B/2016).

Reporting periods

Seasonal periods in Greece are as follows:

- summer: from 1 May to 30 September;
- winter: from 1 October to 30 April.

The monitoring system is implemented twice a year: once for the summer period and once for the winter period.

Sales

Table 3.39 Total sales and sample number

Fuel grade (name)	Biofuel content (% v/v)	Total sales		Samples		Parameters measured
		Litres	Tonnes	Summer	Winter	
Unleaded petrol (minimum RON = 95) E10 (95 RON)	10.0	2 208 097 634	1 650 553	69	47	13 of 19
Unleaded petrol (minimum RON ≥ 98) E10 (Super unleaded (100 RON))	10.0	506 412 357	378 543	14	12	13 of 19
Total Petrol		2 714 509 991	2 029 096	83	59	
Diesel fuel B7 (Diesel fuel)	7.0	3 186 501 345	2 651 169	63	59	4 of 7
Total Diesel		3 186 501 345	2 651 169	63	59	

Exceedances of the fuel quality limits

Petrol fuel grades

Table 3.40 and Table 3.41 summarize the parameter for which exceedances were reported for the petrol fuel grades measured.

Table 3.40 Unleaded petrol (minimum RON = 95) E10 (95 RON)

Parameter	Unit	Limit value	Minimum value measured	Maximum value measured	Number of samples outside tolerance limit	Total number of samples
Vapour pressure, DVPE	kPa	< 60	53.2	72.3	4	69

Table 3.41 Unleaded petrol (minimum RON >= 98) E10 (Super unleaded (100 RON))

Parameter	Unit	Limit value	Minimum value measured	Maximum value measured	Number of samples outside tolerance limit	Total number of samples
Vapour Pressure, DVPE	kPa	< 60	50.0	74.3	3	14

Diesel fuel grades

Table 3.42 summarizes the parameters for which exceedances were reported for the diesel fuel grades measured.

Table 3.42 Diesel fuel B7 (Diesel fuel)

Parameter	Unit	Limit value	Minimum value measured	Maximum value measured	Number of samples outside tolerance limit	Total number of samples
Sulphur content	mg/kg	< 10	3.1	31.9	2	122
FAME Content	% v/v	< 7	6.0	7.9	6	122

3.13 Hungary

Country details

Responsible organization:	HEXUM Laboratories Private Company Limited by Shares
Country size:	Small
Summer period:	1 May to 30 September
FQMS used:	EN 14274 statistical model C
Location of sampling:	Refuelling stations

Fuel quality monitoring service

Sampling

Organization responsible for sampling, testing, and reporting is HEXUM Laboratories Private Company Limited by Shares (before 1st of October 2021, formerly known as ÁMEI Ltd.), as contracted by the Ministry of Innovation and Technology of Hungary.
Fuel samples were taken from retail stations randomly selected from the list of fuel stations collected by the National Tax and Customs Administration (NAV).
Our FQMS system is in line with / equivalent to the system proposed by CEN.

Fuel quality monitoring system administration

Ministry of Innovation and Technology is assigned to manage and operate the FQD.
Fuel sampling and testing have been contracted to AMEI Ltd., from 1st of October 2021 its new name: HEXUM Laboratories Private Company Limited by Shares.
Annual data set is provided by the 31st of March of the consecutive year.
Test results including non-compliances have been quarterly reported to the Ministry.
Model C (small country) was considered best fit for design and implementation.
Hungary has one oil refinery and several distribution terminals. Since import via direct trucking to retail station is material, fuels at retail stations have been sampled.

National legislation that transposed the Fuel Quality Directive

Based on the FQD, National Decree of 17/2017 of Ministry of National Development provides legal framework for running the FQMS monitoring system.

Reporting periods

Seasonal periods in Hungary are as follows:

- summer: from 1 May to 30 September;
- winter: from 15 November to 28/29 February.

Transition periods are from 1 March to 30 April and from 1 October to 14 November. No samples were taken during the transition periods.

Sales

Table 3.43 Total sales and sample number

Fuel grade (name)	Biofuel content (% v/v)	Total sales		Samples		Parameters measured
		Litres	Tonnes	Summer	Winter	
Unleaded petrol (minimum RON = 95) E10 (ESZ-95)	10.0	1 598 270 000	1 196 500	50	50	19 of 19
Unleaded petrol (minimum RON ≥ 98) E5 (ESZ-98)	5.0	376 130 000	281 700	30	30	19 of 19
Total Petrol		1 974 400 000	1 478 200	80	80	
Diesel fuel B7 (Dízel gázolaj)	7.0	4 619 020 000	3 859 700	50	50	6 of 7
Total Diesel		4 619 020 000	3 859 700	50	50	

Exceedances of the fuel quality limits

Petrol fuel grades

Table 3.44 summarizes the parameter for which exceedances were reported for the petrol fuel grades measured.

Table 3.44 Unleaded petrol (minimum RON ≥ 98) E5 (ESZ-98)

Parameter	Unit	Limit value	Minimum value measured	Maximum value measured	Number of samples outside tolerance limit	Total number of samples
Aromatics	% v/v	< 35	29.9	36.9	1	60

Diesel fuel grades

Table 3.45 summarizes the parameter for which exceedances were reported for the diesel fuel grades measured.

Table 3.45 Diesel fuel B7 (Dízel gázolaj)

Parameter	Unit	Limit value	Minimum value measured	Maximum value measured	Number of samples outside tolerance limit	Total number of samples
Sulphur content	% v/v	< 10	3.9	13.9	1	100

3.14 Iceland

Country details

Responsible organization:	Environment Agency of Iceland
Country size:	Small
Summer period:	1 June to 31 August
FQMS used:	National system
Location of sampling:	Terminals

Fuel quality monitoring service

Sampling
Fjölver laboratory analyses all fuel samples. A sample to be tested is taken from each batch delivery that enters Iceland.

Fuel quality monitoring system administration
In Iceland, each fuel batch delivery in controlled and inspected by Fjölver laboratory. The results of tests of the fuel grades are directly compared with the agreed product requirements and are accepted if the results are within given national specifications. The data of delivered fuel batches are reported to the competent authority, The Environment Agency of Iceland. There are four main fuel companies in Iceland: Atlantsolía ehf., Skeljungur hf., Olíverzlun Íslands hf. and N1 hf.

National legislation that transposed the Fuel Quality Directive
The requirements of the FQD are transposed into Icelandic Regulation No 960/2016 and National Law on Chemicals No 61/2013.

Reporting periods
Seasonal periods in Iceland are as follows:

- summer: from 1 June to 31 August;
- winter: from 1 September to 31 May.

Samples were taken and tested during the transition period. The results of samples taken during the transition period are reported.
Maximum vapor pressure is 70 kPa during the summer period due to the low ambient summer temperature.

Sales

Table 3.46 Total sales and sample number

Fuel grade (name)	Biofuel content (% v/v)	Total sales		Samples		Parameters measured
		Litres	Tonnes	Summer	Winter	
Unleaded petrol (minimum 95 < RON < 98) E5 (Unleaded petrol (RON > 95))	4.65	135 321 111	99 042	11	23	13 of 19
Total petrol		135 321 111	99 042	11	23	
Diesel fuel B7	0	271 571 560	227 729	11	23	4 of 7
Total diesel		271 571 560	227 729	11	23	

Exceedances of the fuel quality limits

Petrol fuel grades

No exceedances of the petrol fuel quality limits were reported.

Diesel fuel grades

No exceedances of the diesel fuel quality limits were reported.

3.15 Ireland

Country details

Responsible organization:	Department of the Environment, Climate and Communications
Country size:	Small
Summer period:	1 June to 31 August
FQMS used:	EN 14274 statistical model C
Location of sampling:	Refuelling stations

Fuel quality monitoring service

Sampling

Samples of petrol and diesel are taken by Fuels for Ireland (formerly known as the Irish Petroleum Industry Association) and are analysed by ITS Testing Services (UK) Ltd. Reporting is the responsibility of the Department of Communications, Climate and Environment. Samples are taken from refuelling stations. Selection of sampling points is on a random basis and is carried out throughout the year.

For petrol samples the following test methods were used: R.O.N. EN ISO 5164, M.O.N. EN ISO 5163, vapour pressure at 100 ˚C ISO 3405, olefins, and aromatics ASTM D1319, benzene EN 238, other oxygenates, methanol, ethanol, iso-propanol, iso-butanol, tert-butanol, ethers (five or more C atoms) and other oxygenates EN 13132, sulphur content IP 490 and lead EN 237.

For diesel samples the following methods were used cetane number EN ISO 5165, density at 15 ˚C EN ISO 12185, distillation 95% ISO 3405, polycyclic aromatics EN 12916, sulphur content IP 490 and F.A.M.E. BS EN 14078.

Fuel quality monitoring system administration

The Department of the Environment, Climate and Communications has responsibility for managing and implementing the FQD. Samples of petrol and diesel are taken by Fuels for Ireland and are analysed by ITS Testing Services (UK) Ltd.

Reporting is the responsibility of the Department of Environment, Climate and Communications. Samples are taken from refuelling stations. Selection of sampling points is on a random basis and is carried out throughout the year. Annual data is provided by Fuels for Ireland for the winter period in January of each year and for the summer period in September of each year.

When non-compliant samples are discovered, it is the responsibility of the Department of Environment, Climate and Communications to report, manage and monitor the non-compliance. All non-compliances are reported in the annual Fuel Quality Data Report and follow-up action is also reported. Ireland is a small country, using statistical model C. Whitegate Oil Refinery in County Cork is Ireland's only refinery. There are five distribution terminals in Ireland.

National legislation that transposed the Fuel Quality Directive

European Communities Act 1972 (Environmental Specifications for petrol, diesel fuels and gas oils for use by non-road mobile machinery, including waterway vessels, agricultural and forestry tractors, and recreational craft) Regulations 2011 (SI No 155 of 2011).

Reporting periods

Seasonal periods in Ireland are as follows:

- summer: from 1 June to 31 August;
- winter: from 1 September to 31 May.

Under EC Decision of the 5th of October 2020, on the request from Ireland for a derogation pursuant to Article 3(4) and (5) of Directive 98/70/EC, as amended by Directive 2009/30/EC, Ireland is permitted to

place on the market (during the summer period) petrol with a maximum vapour pressure of 70 kPa (derogation) until the end of 2030 (for more detail see C(2020) 6665 final).

Sales

Table 3.47 Total sales and sample number

Fuel grade (name)	Biofuel content (% v/v)	Total sales		Samples		Parameters measured
		Litres	Tonnes	Summer	Winter	
Unleaded petrol (minimum RON = 95) E5	3.0	1 136 023 765	841 499	46	54	18 of 19
Total petrol		1 136 023 765	841 499	46	54	
Diesel fuel B7	4.0	3 400 737 821	2 874 673	46	54	7 of 7
Total diesel		3 400 737 821	2 874 673	46	54	

Exceedances of the fuel quality limits

Petrol fuel grades
No exceedances of the petrol fuel quality limits were reported.

Diesel fuel grades
No exceedances of the diesel fuel quality limits were reported.

3.16 Italy

Country details

Responsible organization:	Ministry of the Environment and Energy Security
Country size:	Large
Summer period:	1 May to 30 September
FQMS used:	EN 14274 statistical model A
Location of sampling:	Refuelling stations

Fuel quality monitoring service

Sampling
The monitoring system was set up using the Statistical Model A of EN 14274 (large country framework, five macro-regions). A total of 419 petrol samples and 511 diesel fuel samples were analysed. The distribution of samples throughout the national territory was: 31% north-west; 14% north-east; 18% centre; 15% south; and 22% islands. The test methods required for fuel quality monitoring were performed by laboratories that regularly participate in one or more national inter-laboratory proficiency testing schemes, and that are accredited according to EN ISO 17025 or certified according to ISO 9000 standards. The proficiency testing schemes include all test methods listed in the FQMS. In accordance with the requirements of EN 14274, analytical results for petrol and diesel fuel were reported separately for each season and for each grade. Selection of sampling points is on a random basis but in accordance with the sales in each macro-region; In 2021, the sampling was carried out at refuelling stations only. Samples of petrol and diesel are taken by independent supervisory bodies.

Fuel quality monitoring system administration
Italy established a fuel quality monitoring system, in accordance with the requirements of the European standard EN 14274:2003, by decree of the 3rd of February of 2005. The competent authority for the system of monitoring fuel quality is the Ministry of the Environment and Energy Security.
The fuel quality monitoring (sampling and measurements) was conducted by independent supervisory bodies on behalf of the main oil companies. The supervisory bodies forward their results to the Italian National Institute for Environmental Protection and Research, where a general report is produced. Based on this report, the Ministry of the Environment and Energy Security produces data for the European Commission.

National legislation that transposed the Fuel Quality Directive
The FQD was transposed by the Legislative Decree of 21st of March 2005, n. 66 to the national law.

Reporting periods
Seasonal periods in Italy are as follows:

- summer: petrol from 1 May to 30 September; diesel from 16 March to 14 November;
- winter: petrol from 15 November to 15 March; diesel from 15 November to 15 March.

Only three samples of petrol were taken during the transition period in October.

Sales

Table 3.48 Total sales and sample number

Fuel grade (name)	Biofuel content (% v/v)	Total sales		Samples		Parameters measured
		Litres	Tonnes	Summer	Winter	
Unleaded petrol (minimum RON = 95) E5 (E5)	0.91	9 276 909 000	5 929 210	225	194	18 of 19
Total Petrol		9 276 909 000	5 929 210	225	194	
Diesel fuel B7 (B7)	5.86	29 204 475 000	25 206 218	299	212	6 of 7
Total Diesel		29 204 475 000	25 206 218	299	212	

Exceedances of the fuel quality limits

Petrol fuel grades

Table 3.49 summarizes the parameter for which one exceedance was reported for the petrol fuel grades measured.

Table 3.49 Unleaded petrol (minimum RON = 95) (E5)

Parameter	Unit	Limit value	Minimum value measured	Maximum value measured	Number of samples outside tolerance limit	Total number of samples
Distillation, evaporated at 150 °C	% v/v	> 75	58.7	99.3	1	419
Distillation, evaporated at 100 °C	% v/v	> 46	44.5	68.9	1	419

Diesel fuel grades

Table 3.50 summarizes the parameters for which exceedances were reported for the diesel fuel grades measured.

Table 3.50 Diesel fuel B7

Parameter	Unit	Limit value	Minimum value measured	Maximum value measured	Number of samples outside tolerance limit	Total number of samples
Cetane number	--	> 51	47.8	60.7	2	295
Sulphur content	mg/kg	< 10	2.2	12.0	1	414

3.17 Latvia

Country details

Responsible organization:	The State Construction Control Bureau of Latvia (SCCB)
Country size:	Small
Summer period:	1 June to 31 August
FQMS used:	EN 14274 statistical model C
Location of sampling:	Refuelling stations and terminals

Fuel quality monitoring service

Sampling

The Bureau is responsible for the supervision and control of the fulfilment of transport energy conditions, including the organizing of fuel quality monitoring and reporting about fuel quality. The data on fuel quality conformity assessment included in this report has been obtained by The State Construction Control Bureau (hereinafter - Bureau) of Latvia based on the fuel quality monitoring performed in 2021. An agreement was concluded between the Bureau and the accredited laboratory which carries out fuel testing and conformity assessment. Fuel sampling is performed at refuelling stations in all regions of Latvia. Sampling points are selected randomly.

Fuel quality monitoring system administration

The SCCB is responsible for managing and implementing the FQD and performs the fuel quality monitoring in Latvia. Fuel sampling is conducted by an accredited laboratory ltd Latvian Certification Centre with which the SCCB has a contract.

The State Revenue Service is responsible for acting when non-compliant samples are discovered. FQMS is established according to the standard EN 14274 statistical model C, considering that the total automotive fuel sales in the country is less than fifteen million tons per annum. Fuel samples are taken from refuelling stations (selected at random) in all regions of Latvia.

National legislation that transposed the Fuel Quality Directive

The legislation regarding fuel quality has been transposed into the national law by the Regulation No. 332, which determine the quality requirements for petrol and diesel fuel offered in the Latvian market provided for the operation of the spark ignition internal combustion engines and the compression ignition internal combustion engines, as well as determines the institutions for supervision of the market, procedures for conformity assessment of petrol and supervision of the market.

Cabinet Regulation No. 772 ''Regulations Regarding Requirements for Biofuel Quality, Conformity Assessment, Market Supervision and Procedures for Consumer Information'' (Regulation No. 772) which prescribe the quality requirements for biofuel, the procedures by which the production of biofuel and blending thereof with fossil fuel shall be controlled and the procedures by which consumers shall be informed regarding the content of biofuel present at points of sale and the conformity thereof with quality requirements.

From 2020, the SCCB is responsible for the supervision of the fuel market and performs annual fuel quality monitoring following the amendments of Regulation No. 332. A legislative change and new legislation are currently being developed by The Ministry of Economics of the Republic of Latvia which is the leading authority in the field of energy policy.

Reporting periods

Seasonal periods in Latvia are as follows:

- summer: from 1 June to 31 August;

- winter: from 1 November to 1 April.

In Latvia, regulations determine that diesel fuel shall have an admixture of biofuel not less than 6.5% by volume of the total quantity of petroleum products (obligatory from the 1st of April until the 31st of October (summer period). These requirements do not apply to class zero to four diesel fuel to be used in arctic and severe winter conditions, according to the standard LVS EN 590, which is sold in retail trade between the 1st of November and the 1st of April (winter period).

These periods are used also for petrol fuel, however considering that Latvia has been granted a vapour pressure waiver, respectively maximum vapour pressure for petrol must not exceed 70 kPa during the period from the 1st of June until the 31st of August. Another requirement for petrol fuel is that vapour pressure from the 1st of September to the 31st of May does not exceed 100 kPa. Petrol samples taken in April, May, September, and October were included in the annual fuel quality report and reported within the summer period.

As stated above, a vapour pressure derogation has been granted to Latvia because of the low ambient summer temperature (maximum is 70 kPa) till 31 December 2030 (for more detail, see C(2021) 3723 final).

Sales

Table 3.51 Total sales and sample number

Fuel grade (name)	Biofuel content (% v/v)	Total sales		Samples		Parameters measured
		Litres	Tonnes	Summer	Winter	
Unleaded petrol (minimum RON = 95) E10 (A-95)	10.0	183 413 072	140 311	54	44	19 of 19
Unleaded petrol (minimum RON = 95) E+ (E85)	85.0	108 497	83			
Unleaded petrol (minimum RON ≥ 98) E5 (A-98)	0	29 664 052	22 693	37	33	19 of 19
Total Petrol		213 185 621	163 087	91	77	
Diesel fuel B7 (DD)	7.0	1 220 421 557	1 019 052	62	63	7 of 7
Total Diesel		1 220 421 557	1 019 052	62	63	

Exceedances of the fuel quality limits

Petrol fuel grades

Table 3.52 and Table 3.53 summarizes the parameters for which exceedances were reported for the petrol fuel grades measured.

Table 3.52 Unleaded petrol (minimum RON = 95) E10 (A-95)

Parameter	Unit	Limit value	Minimum value measured	Maximum value measured	Number of samples outside tolerance limit	Total number of samples
Research Octane Number	--	> 95	93.6	96.9	1	98
Motor Octane Number	--	> 85	84.0	86.7	1	98

Table 3.53 Unleaded petrol (minimum RON ≥ 98) E5 (A-98)

Parameter	Unit	Limit value	Minimum value measured	Maximum value measured	Number of samples outside tolerance limit	Total number of samples
Research Octane Number	--	> 98	96.8	99.0	2	70

Diesel fuel grades

Table 3.54 summarizes the parameter for which exceedances were reported for the diesel fuel grades measured.

Table 3.54 Diesel fuel B7

Parameter	Unit	Limit value	Minimum value measured	Maximum value measured	Number of samples outside tolerance limit	Total number of samples
FAME content	% v/v	6.5-7.0	0	6.9	3	125

3.18 Lithuania

Country details

Responsible organization:	Ministry of Energy
Country size:	Small
Summer period:	1 May to 30 September
FQMS used:	EN 14274 statistical model C
Location of sampling:	Refuelling stations

Fuel quality monitoring service

Sampling
The State Consumer Rights Protection Authority is responsible for sampling and analysis. The organization responsible for reporting is the Ministry of Energy. 111 samples of petrol A-95 (A-98) were taken at the service stations.

Fuel quality monitoring system administration
The Ministry of Energy has responsibility for managing and implementing the FQD. Fuel sampling was conducted by The State Consumer Rights Protection Authority, which is responsible for acting where non-compliant samples are discovered. Lithuania is a small sized country, using statistical model C (standard EN 14274). The whole country is defined as one region.

National legislation that transposed the Fuel Quality Directive
Standards EN 228 and diesel EN 590 have been transposed into national legal acts. All acts are related to researching parameters of fuel and diesel samples and are fully transposed into Lithuanian legislation.

Reporting periods
Seasonal periods in Lithuania are as follows:

- summer: from 1 May to 30 September;
- winter: from 1 October to 30 April.

Samples are taken during transition periods, as there are no filtering and cloud temperatures in the reports, and the indicators mentioned are also suitable for the winter period. Samples from 1 October to 30 November and from 1 March to 30 April are also covered by data from the winter period.
Vapour pressure waiver has been granted for Lithuania due to the low ambient summer temperature (maximum 70 kPa for the summer period).

Sales

Table 3.55 Total sales and sample number

Fuel grade (name)	Biofuel content (% v/v)	Total sales		Samples		Parameters measured
		Litres	Tonnes	Summer	Winter	
Unleaded petrol (minimum RON = 95) E10 (A-95 (RON 95))	10.0	341 153 077	256 547	50	50	19 of 19
Unleaded petrol (minimum RON ≥ 98) E10 (A-98 (RON 98))	10.0	12 432 337	9 349	0	4	
Unleaded petrol (minimum RON ≥ 98) E+ (A-98 (RON 98)) [17]	10.0	161 036	121	0	0	19 of 19
Total Petrol		353 746 450	266 017	50	54	
Diesel fuel B+ (>7% FAME ≤ 30%) (Diesel)	7.0	2 177 628 199	1 840 096	50	50	7 of 7
Total Diesel		2 177 628 199	1 840 096	50	50	

Exceedances of the fuel quality limits

Petrol fuel grades
No exceedances of the petrol fuel quality limits were reported.

Diesel fuel grades
No exceedances of the diesel fuel quality limits were reported.

[17] There are no samples analysed for E+, therefore the median/mean values of ethanol are not known to EEA. The assignment of the fuel grade was taken as submitted by Lithuania.

3.19 Luxembourg

Country details

Responsible organization:	Environmental Administration of Luxembourg (Administration de l'environnement)
Country size:	Small
Summer period:	1 May to 30 September
FQMS used:	National system
Location of sampling:	Refuelling stations and terminals

Fuel quality monitoring service

Sampling

For 2021, the sampling, analysis and reporting of fuel quality was managed by three organizations. The samples were taken at depots and public refuelling stations. The sampling points were selected at random. Test methods are those specified in EN 228 and EN 590. The samples have to be taken in accordance with the methods described in the European standards:

- EN 14275, if taken at fuel stations;
- EN ISO 3170, if taken at terminals.

Fuel quality monitoring system administration

The fuel sampling, the analyses and reporting is conducted by an agreed organization. Within one week the results of the analysed parameters have to be transmitted to the Environmental Administration of Luxembourg.

In case of a non-compliant sample, the agreed organization has to inform the Environmental Administration at once. After a written warning, the provider or operator had 48 hours to take the necessary measures. The provider or operator informs at once the Environmental Administration of the measures undertaken. A new sample then is taken within 3 working days following the written warning.

In 2009, the Luxembourgish Environmental Administration worked out, in collaboration with the Austrian federal Environment Agency, a concept to improve, respectively to establish a national fuel quality monitoring system for Luxembourg.

A two-day workshop was held with the intention to bring all stakeholders together and to discuss different proposals as well as to create a possible way forward. Besides the project partners, various representatives, for instance from the mineral oil industry, fuels laboratories or other EU countries where a FQMS was already established, attended the meeting.

The main outcomes were the following:

- it's possible to reduce the number of samples for diesel to a minimum amount of 86 samples a year instead of 100 (EN 14274);
- it's possible to reduce the number of samples for petrol grades (RON 95, RON 98) to a minimum amount of 66 samples instead of 2 x 100 (EN 14274).

without degrading the informative value and quality of the monitoring system. The following considerations have been considered during design and implementation:

1. Country specific data such as population, surface, number of passengers car and buses, number of Petrol stations, fuel sales/grade.
2. Economy.
3. Supply points and distribution patterns of fossil fuel.

Luxembourg has no own refinery on its territory; therefore, it depends on imports of petrol and diesel from other Member States, mainly from Belgium, the Netherlands and Germany (by truck, train, or ship).

Fuel stations at the closer border regions are delivered directly by truck from terminals in Belgium (Liege, Feluy/Brussels) and from terminals in Germany (Treves), a few are supplied by the terminal in Mertert, whereas midland fuel stations are normally delivered from a terminal in Bertrange (composed of several big tanks). The inland terminals in Bertrange and Mertert are delivered directly or indirectly by ship or train from refineries in Belgium, the Netherlands or Germany.

National legislation that transposed the Fuel Quality Directive

Directive 98/70/CE amended by Directive 2009/30/CE is entirely transposed into national law by the Grand-ducal ordinance of 16 May 2012 concerning the quality of petrol and diesel fuels and the sustainable use of biofuels (Règlement grand-ducal du 16 mars 2012 concernant la qualité de l'essence et des carburants diesel et l' utilisation durable des biocarburants, Mém. A-55, 26 mars 2012, p. 626, www.legilux.lu).

Reporting periods

Seasonal periods in Luxembourg are as follows:

- summer: from 1 May to 30 September;
- winter: from 1 October to 30 April.

The transition periods are regulated by the Grand-ducal ordinance 'Règlement grand-ducal du 16 mars 2012 concernant la qualité de l'essence et des carburants diesel et l'utilisation durable des biocarburants'. During the transition period there was no samples taken nor tested. No vapour pressure derogation has been granted.

Sales

Table 3.56 Total sales and sample number

Fuel grade (name)	Biofuel content (% v/v)	Total sales		Samples		Parameters measured
		Litres	Tonnes	Summer	Winter	
Unleaded petrol (minimum RON = 95) E10 (Euro 95)	10.0	334 538 454	247 558	31	31	19 of 19
Unleaded petrol (minimum RON ≥ 98) E5 (Euro 98)	5.0	101 438 176	75 064	31	31	19 of 19
Total Petrol		435 976 629	322 623	62	62	
Diesel fuel B7 (Diesel)	7.0	1 521 770 204	1 263 069	31	31	7 of 7
Total Diesel		1 521 770 204	1 263 069	31	31	

Exceedances of the fuel quality limits

Petrol fuel grades

Table 3.57 and Table 3.58 summarize the parameters for which exceedances were reported for the petrol fuel grades measured.

Table 3.57 Unleaded petrol (minimum RON = 95) E10 (Euro 95)

Parameter	Unit	Limit value	Minimum value measured	Maximum value measured	Number of samples outside tolerance limit	Total number of samples
Motor Octane Number	--	> 85	84.0	86.5	1	62
Vapour pressure	kPa	< 60	55.2	61.8	1	62
Sulphur content	mg/kg	< 10	1.2	10.7	1	62

Table 3.58 Unleaded petrol (minimum RON ≥ 98) E5 (Euro 98)

Parameter	Unit	Limit value	Minimum value measured	Maximum value measured	Number of samples outside tolerance limit	Total number of samples
Vapour pressure	kPa	< 60	51.9	62.2	6	62

Diesel fuel grades

No exceedances of the diesel fuel quality limits were reported.

3.20 Malta

Country details

Responsible organization:	Regulator for Energy and Water Services (REWS)
Country size:	Small
Summer period:	1 May to 30 September
FQMS used:	EN 14274 statistical model C
Location of sampling:	Refuelling stations

Fuel quality monitoring service

Sampling

The organization responsible for the sampling and the reporting is the Regulator for Energy and Water Services (REWS). The organization responsible for the analysis is an independently contracted laboratory. There is no additional information to that reported for the year 2020. A total of 217 fuel samples were analysed, comprising of 107 samples of diesel, 104 samples of unleaded petrol minimum RON 95 and six samples of unleaded petrol minimum RON 98. Unleaded petrol samples were analysed against the SM EN 228 quality standard and the diesel samples were analysed against the SM EN 590 quality standard.
All the samples were taken from refuelling stations and analysed at an independent laboratory.

Fuel quality monitoring system administration

Malta is a small sized country, using statistical model C. The whole country is defined as one region.
A minimum of 50 samples were taken per period (winter/summer) and per fuel grade, which exceeded the 10% market share of the parent grade. A total of 217 samples were collected by REWS compliance officers from fuel dispensing sites and then analysed at the independently contracted laboratory.

National legislation that transposed the Fuel Quality Directive

All the actions are carried out by the Regulator for Energy and Water Services (REWS). The national subsidiary legislation, the Quality of Fuels Regulations, is S.L. 545.18. The actions related to the reduction of the GHG intensity of fuels supplied, under Article 7a of the FQD, are performed by the Malta Resources Authority. The national subsidiary legislation is S.L. 423.48, Lifecycle GHG Emissions from Fuels Regulations.

Reporting periods

Seasonal periods in Malta are as follows:

- summer: from 1 May to 30 September;
- winter: from 1 October to 30 April.

Monthly fuel samples were taken throughout the whole calendar year, including the transition period.
No additional information to that reported for previous years as regards to seasonal and transition periods.
It is noted that although national restrictions were in place due to the Covid-19 pandemic, the sampling of fuel was not affected.

Sales

Table 3.59 Total sales and sample number

Fuel grade (name)	Biofuel content (% v/v)	Total sales		Samples		Parameters measured
		Litres	Tonnes	Summer	Winter	
Unleaded petrol (minimum RON = 95) E5 (EN 228 minimum RON 95)	0.0	98 572 950	73 017	52	52	19 of 19
Unleaded petrol (minimum RON ≥ 98) E5 (EN 228 minimum RON 98)	0.0	3 484 350	2 581	3	3	19 of 19
Total Petrol		102 057 300	75 598	55	55	
Diesel fuel B7 (Diesel EN 590)	7.0	172 038 300	145 180	55	52	6 of 7
Total Diesel		172 038 300	145 180	55	52	

Exceedances of the fuel quality limits

Petrol fuel grades

No exceedances of the petrol fuel quality limits were reported.

Diesel fuel grades

No exceedances of the diesel fuel quality limits were reported.

3.21 Netherlands

Country details

Responsible organization:	Human Environment and Transport Inspectorate, Ministry of Infrastructure and Water Management
Country size:	Small
Summer period:	1 May to 30 September
FQMS used:	EN 14274 statistical model A
Location of sampling:	Refuelling stations

Fuel quality monitoring service

Sampling
The inspectors from the Human Environment and Transport Inspectorate of the Ministry of Infrastructure and Water Management are responsible for taking the samples and reporting. The Netherlands has 12 provinces. It was decided to take samples at fuel service stations from different oil companies. Samples were taken in each province based on the number of inhabitants and the number of fuel service stations in each province.

Fuel quality monitoring system administration
The Human Environment and Transport Inspectorate of the Ministry of Infrastructure and Water Management have responsibility for managing and implementing the FQM Directive. The analysis of all parameters type diesel is performed by the Dutch Customs Laboratory.
The analysis of all parameters of petrol is performed by the laboratory of SGS Nederland B.V. The inspectors from the Human Environment and Transport Inspectorate are responsible for acting where non-compliant samples are discovered – and the processes in place to report, manage and monitor such non-compliance. This action consisted of alerting the offender to the detected offense and warning to prevent its repetition.

National legislation that transposed the Fuel Quality Directive
The Human Environment and Transport Inspectorate of the Ministry of Infrastructure and Water Management have responsibility for managing and implementing the FQD. The analysis of all parameters of diesel is performed by the Dutch Customs Laboratory. The analysis of all parameters of petrol is performed by the laboratory of SGS Nederland B.V.
The inspectors from the Human Environment and Transport Inspectorate are responsible for acting where non-compliant samples are discovered – and the processes in place to report, manage and monitor such non-compliance. This action consisted of alerting the offender to the detected offense and warning to prevent its repetition.

Reporting periods
Seasonal periods in Netherlands are as follows:

- summer: from 1 May to 30 September;
- winter: from 1 January to 30 April and 1 October to 31 December.

No samples were collected during the transition period.

Sales

Table 3.60 Total sales and sample number

Fuel grade (name)	Biofuel content (% v/v)	Total sales		Samples		Parameters measured
		Litres	Tonnes	Summer	Winter	
Unleaded petrol (minimum 95 < RON < 98) E10 (E10)	10.0	5 129 041 667	3 688 630	50	50	17 of 19
Unleaded petrol (minimum RON ≥ 98) E5 (E5)	5.0	176 000 000	131 000	0	0	0 of 19
Total Petrol		5 305 041 667	3 819 630	50	50	
Diesel fuel B7 (Diesel)	7.0	5 737 559 524	4 819 550	50	50	6 of 7
Total Diesel		5 737 559 524	4 819 550	50	50	

Exceedances of the fuel quality limits

Petrol fuel grades

No exceedances of the petrol fuel quality limits were reported.

Diesel fuel grades

No exceedances of the diesel fuel quality limits were reported**.**

3.22 Norway

Country details

Responsible organization:	Norwegian Environment Agency
Country size:	Small
Summer period:	1 June to 31 August
FQMS used:	National system
Location of sampling:	Refuelling stations

Fuel quality monitoring service

Sampling

From 2012, detailed information is only required every three years. Thus, no detailed information is required for 2021. In Norway, the FQMS today is based on data from Certificates of Quality. Intertek has been engaged to take the physical samples and perform laboratory analysis. Random samples (32 in summer and 32 in winter period) were collected at petrol stations. In the summer period (June-August), the samples were taken in middle of Norway (Møre og Romsdal, Trøndelag and Nordland) and in the winter period (November-December) the samples were taken in the south/east of Norway (Buskerud, Vestfold, and Telemark).

The samples were collected from different companies, making sure that samples were taken from all companies. Samples were collected according to EN 14274:2013.

Fuel quality monitoring system administration

From 2012, detailed information is only required every three years. Thus, no detailed information is required for 2021.

The Norwegian Environment Agency is responsible for managing the FQM. The Ministry of Climate and Environment is responsible for audits and follow up if non-complied system that has been developed by the business sector is used. Norway is a small sized country and there are no regional differences in fuel qualities on refineries and the distribution terminals. The Fuel Quality Monitoring data report is usually provided by the 30th of June.

National legislation that transposed the Fuel Quality Directive

The Fuel Quality Directive is transposed in the Norwegian product regulation which is a regulation under the Product Control Act: https://lovdata.no/dokument/SF/forskrift/2004-06-01-922.

Reporting periods

Seasonal periods in Norway are as follows:

- summer: from 1 June to 31 August;
- winter: from 1 October to 30 April.

Transition periods are from the 1st to the 31st of May and from the 1st to the 30th of September.

Due to the arctic conditions in certain parts of Norway, the maximum vapour pressure is 70 kPa for the summer period. During the winter the maximum vapour pressure is 100 kPa in accordance with the Norwegian Oil Industry Standard.

Sales

Table 3.61 Total sales and sample number

Fuel grade (name)	Biofuel content (% v/v)	Total sales		Samples		Parameters measured
		Litres	Tonnes	Summer	Winter	
Unleaded petrol (minimum RON = 95) E5 ((95 BF) E5)	5.0	949 739	702 807	10	10	18 of 19
Unleaded petrol (minimum RON ≥ 98) E5 (98 BF)	0.0	20 940	15 502	0	0	0 of 19
Total petrol		970 679	718 309	10	10	
Diesel fuel B7 (B7)	7.0	2 966 358	2 491 741	22	22	6 of 7
Total diesel		2 966 358	2 491 741	22	22	

Exceedances of the fuel quality limits

Petrol fuel grades

Table 3.62 summarize the parameters for which exceedances were reported for the petrol fuel grades measured.

Table 3.62 Unleaded petrol (minimum RON = 95) E5 ((95 BF) E5)

Parameter	Unit	Limit value	Minimum value measured	Maximum value measured	Number of samples outside tolerance limit	Total number of samples
Research Octane Number	--	> 95	93.1	97.3	9	20
Motor Octane Number	--	> 85	84.1	86.1	2	20

Diesel fuel grades

No exceedances of the diesel fuel quality limits were reported.

3.23 Poland

Country details

Responsible organization:	Urząd Ochrony Konkurencji i Konsumentów
Country size:	Large
Summer period:	1 May to 30 September
FQMS used:	EN 14274 statistical model B
Location of sampling:	Refuelling stations

Fuel quality monitoring service

Sampling

The fuel quality monitoring and control system is managed by the President of the Office of Competition and Consumer Protection. Tasks related to system management are carried out with the help of the Trade Inspection, which conducts the fuel quality inspections. Fuel quality analysis is carried out by laboratories accredited by the Polish Centre for Accreditation for fuel testing with the methods, specified in the regulations on test methods.

To separate the control activities carried out to prepare a report for the European Commission on fuel quality, a monitoring system was introduced, which refers to the control of:

- RON 98 lead-free petrol, RON 95 lead-free petrol, diesel oil,
- liquid biofuels i.e., diesel oil with the content of 20% ester (B20) and ester constituting an independent fuel (B100),
- conduction only at fuel and factory stations that are selected for inspection,
- selection of fuel samples in the amount specified in the regulation,

based on the method of monitoring and the European standard EN 14274,

- all quality parameters listed in the FQD, and some parameters of the so-called operational use listed in the regulation, which are also listed in the standards EN 228 and EN 590,
- all quality parameters listed in the Regulation on the quality requirements for liquid biofuels, which are also listed in EN 14214,
- selection of one fuel sample of one type at the station. Fuel quality control under the European part of the system covered the following types of liquid fuels traded in the territory of the country, i.e.:
  - RON 95 unleaded petrol,
  - RON 98 lead-free petrol,
  - diesel.

Fuel quality monitoring system administration

The tasks related to the FQMS are performed by the President of the Office of Competition and Consumer Protection (the administrator of the system). Poland has adopted the FQMS, specified in the EN 14274, considering the specificity of the Polish conditions. Poland is a large sized country, using the statistical model B to monitor the fuel quality. The country is divided into 16 macro-regions.

Considering the specificity of the Polish market for liquid fuels, due to the low availability of unleaded petrol RON 98 at Polish stations, in the regulation on the method of monitoring, the minimum number of samples for this type of fuel for each monitoring period is 30, not 100, as specified in the EN 14274 standard. At the same time, due to the fact that in Poland over the past few years, the annual fuel consumption exceeds 15 million tonnes, which classifies Poland as a large country, and due to the comments of the European Commission regarding the insufficient number of samples taken, the number of samples was doubled by taking 200 samples of diesel and petrol RON 95 as well as 60 samples of petrol RON 98 for each monitoring period (i.e. per summer and winter).

National legislation that transposed the Fuel Quality Directive

The legal basis for the operation of the fuel quality monitoring and control system in Poland are the following:

- Act of August 25, 2006, on the fuel quality monitoring and control system (Journal of Laws of 2021, item 133, as amended), hereinafter referred to as the "Act",
- Act of December 15, 2000, on the Trade Inspection (Journal of Laws of 2020, item 1706) and implementing acts issued on its basis,
- Regulation of the Minister of Economy of September 21, 2007, on the method of monitoring the quality of liquid fuels, liquid biofuels, as well as report templates for these fuels, as well as for liquefied gas (LPG) and compressed natural gas (CNG) (Journal of Laws of 2019. item 641), hereinafter referred to as the "Regulation on the method of monitoring",
- Regulation of the Minister of Economy of October 9, 2015, on quality requirements for liquid fuels (Journal of Laws, item 1680, as amended), hereinafter referred to as the "Regulation on quality requirements",
- Regulation of the Minister of Economy of March 25, 2010, on methods of testing the quality of liquid fuels (Journal of Laws of 2017, item 247), hereinafter referred to as "the Regulation on methods of testing the quality of liquid fuels",
- Regulation of the Minister of Energy of May 25, 2016, on quality requirements for liquid biofuels (Journal of Laws of 2016, item 771), hereinafter referred to as "the Regulation on quality requirements for liquid biofuels",
- Regulation of the Minister of Energy of October 14, 2016, on methods of testing the quality of liquid biofuels (Journal of Laws of 2016, item 1802), hereinafter referred to as "the Regulation on methods of testing the quality of liquid biofuels",
- Regulation of the Minister of Climate of April 22, 2020, amending the regulation on the quality requirements for liquid fuels (Journal of Laws of 2020, item 727).

Reporting periods

Seasonal periods in Poland are as follows:

- summer: from 1 May to 30 September (petrol); 16 April to 30 September (diesel);
- winter: from 1 October to 30 April.

Transition periods for petrol is from 1 March to 30 April and from 1 to 31 October and for diesel is from 1 March to 15 April and from 1 October to 15 November. Samples were taken during the transition periods.

Sales

Table 3.63 Total sales and sample number

Fuel grade (name)	Biofuel content (% v/v)	Total sales		Samples		Parameters measured
		Litres	Tonnes	Summer	Winter	
Unleaded petrol (minimum RON = 95) E5 (RON95)	5.0	5 957 640 000	4 446 000	206	241	19 of 19
Unleaded petrol (minimum RON ≥ 98) E5 (RON98)	5.0	536 000 000	400 000	62	90	19 of 19
Total Petrol		6 493 640 000	4 846 000	268	331	
Diesel fuel B7 (ON)	7.0	21 465 380 000	18 191 000	201	224	7 of 7
Total Diesel		21 465 380 000	18 191 000	201	224	

Exceedances of the fuel quality limits

Petrol fuel grades

Table 3.64 summarizes the parameter for which one exceedance were reported for the petrol fuel grades measured.

Table 3.64 Unleaded petrol (minimum RON = 95) E5 (RON95)

Parameter	Unit	Limit value	Minimum value measured	Maximum value measured	Number of samples outside tolerance limit	Total number of samples
Oxygen content	% m/m	< 2.7	1.34	3.2	1	433

Diesel fuel grades

No exceedances of the diesel fuel quality limits were reported.

3.24 Portugal

Country details

Responsible organization:	Directorate-General for Energy and Geology (DGEG)
Country size:	Small
Summer period:	1 May to 30 September
FQMS used:	EN 14274 statistical model C
Location of sampling:	Refuelling stations

Fuel quality monitoring service

Sampling
The bodies performing the analysis are selected through a public tender held by ENSE and sampling is performed by the ENSE, itself. The ENSE collects samples from filling stations across the country and throughout the year. The selection of filling stations is undertaken by the ENSE. The methods of analysis used are those described in Directive 98/70/EC (The method used for each parameter can be found in the "Test methods and analyses" tables of Reporting Results tables, where the number of values exceeded and their values are indicated, in the corresponding row of the method of analysis used).

Fuel quality monitoring system administration
The body responsible for the FQMS is the Ministry of Environment and Climate Action. The Directorate-General for Energy and Geology coordinates, prepares and submits the annual reports. Analyses are performed by entities selected through public tender held by the ENSE. Portugal is a small sized country, using statistical model C. The whole country is defined as one region under this model.
The consumption or marketing of fuels that do not meet the specifications in force constitutes an infraction punishable by fine, which involves reporting to the authority responsible for prosecution. Refinery). The end of the refining activity in Matosinhos Refinery in 2021 (in the north) implied the concentration of refining operations in the Sines Refinery (in the south).

National legislation that transposed the Fuel Quality Directive
Decree-Law nº 89/2008, of 30 May, amended by Decree-Law nº 142/2010, of 31 December, Decree-Law nº 214-E/2015, of 30 September and Decree-Law nº 152-C/2017, of 11 December, transposed FQD, and its successive amendments.
The requirements of FQMS are set out in Articles 13º and 14º of Decree-Law nº 89/2008, of 30 May.

Reporting periods
Seasonal periods in Portugal are as follows:

- summer: from 1 May to 30 September;
- winter: from 1 November to 31 March.

Transition periods are the months of April and October.
Analyses are performed in the transition periods, but the results are not included in this annual report, in accordance with the provisions of the European Standard EN 14274.
Portugal grants a vapour pressure derogation for petrol, established by the Dispatch nº. 9558/2021, D.R. (Series II) of 30 September: Derogation from the maximum vapor pressure, from 60 kPa to 68 kPa, for fuel grade of petrol “Eurosuper” (I.O.95), containing bioethanol, in the period from 1 May to 30 September. A vapour pressure derogation has been granted to Portugal until 31 December 2025 (for more detail see EC decision C(2022) 5591).

Sales

Table 3.65 Total sales and sample number

Fuel grade (name)	Biofuel content (% v/v)	Total sales		Samples		Parameters measured
		Litres	Tonnes	Summer	Winter	
Unleaded petrol (minimum RON = 95) E5 (Eurosuper)	1.22	996 195 710	743 162	166	72	19 of 19
Unleaded petrol (minimum RON ≥ 98) E5 (Superplus)	1.22	95 566 313	72 057	11	5	19 of 19
Total petrol		1 091 762 023	815 219	177	77	
Diesel fuel B7 (Gasóleo)	6.89	4 244 002 381	3 564 962	192	78	7 of 7
Total diesel		4 244 002 381	3 564 962	192	78	

Exceedances of the fuel quality limits

Petrol fuel grades

Table 3.66 and Table 3.67 summarize the parameters for which exceedances were reported for the petrol fuel grades measured.

Table 3.66 Unleaded petrol (minimum RON = 95) E5 (Eurosuper)

Parameter	Unit	Limit value	Minimum value measured	Maximum value measured	Number of samples outside tolerance limit	Total number of samples
Research Octane Number	--	> 95	91.9	96.8	7	237
Motor Octane Number	--	> 85	83.7	86.3	13	237
Vapour pressure	kPa	45-68	39.9	67.3	1	165
Aromatics	% v/v	< 35	23.2	50.8	1	238
Methanol	% v/v	< 3	0.01	3.99	1	238
Ethanol	% v/v	< 5	0.01	5.46	2	238
Sulphur content	mg/kg	< 10	4.0	12.5	1	238

Table 3.67 Unleaded petrol (minimum RON ≥ 98) E5 (Superplus)

Parameter	Unit	Limit value	Minimum value measured	Maximum value measured	Number of samples outside tolerance limit	Total number of samples
Motor Octane Number	--	> 87	86.0	87.7	6	16

Diesel fuel grades

Table 3.68 summarizes the parameter for which one exceedance was reported for the diesel fuel grades measured.

Table 3.68 Diesel fuel B7 (Gasóleo)

Parameter	Unit	Limit value	Minimum value measured	Maximum value measured	Number of samples outside tolerance limit	Total number of samples
Sulphur content	mg/kg	< 10	5.0	29.9	1	270

3.25 Romania

Country details

Responsible organization:	Ministry of Energy
Country size:	Small
Summer period:	1 May to 30 September
FQMS used:	EN 14274 Statistical Model A
Location of sampling:	Refuelling stations

Fuel quality monitoring service

Sampling
Sampling is under the specifications of SR EN 14274:2013 and SR EN 14275:2013. The sampling activity is carried out by a third-party verification which has been designated for sampling, analysis, and reporting, following a public procurement procedure. Samples are taken in refuelling stations and, from 2019, in terminals/depots inclusively.
Sampling is planned to be performed twice each year, and in 2021 samples were collected during a single sampling activity carried out in the winter and summer periods.

Fuel quality monitoring system administration
The Ministry of Energy is responsible for managing and implementing the FQD and FQMS. Fuel sampling activities during the summer and winter periods are carried out by a privately contracted entity. The gathering of information on sales from the fuel suppliers is updated under the Order of the Ministry of Energy (nor. 569/2019).
Romania is a small sized country, using statistical model A (EN 14274) to monitor fuel quality. The country is divided into four macro-regions. The public body responsible for acting where non-compliant samples are discovered is the National Authority for Protection of Consumers, designated in the national legislation.

National legislation that transposed the Fuel Quality Directive
The Government Decisions no. 928/2012 and 935/2011 were abolished by the Emergency Government Ordinance no. 80/2018 approved by Law no. 311/2018, with the additional specifications of Order of the Ministry of Energy no. 569/2019.

Reporting periods
Seasonal periods in Romania are as follows:

- summer: from 1 May to 30 September;
- winter: from 16 November to 14 March.

No samples were taken during the transition periods.

Sales

Table 3.69 Total sales and sample number

Fuel grade (name)	Biofuel content (% v/v)	Total sales		Samples		Parameters measured
		Litres	Tonnes	Summer	Winter	
Unleaded petrol (minimum 95 < RON < 98) E10 (Benzină COR-95)	8.0	1 293 710 431	1 199 752	50	50	19 of 19
Unleaded petrol (minimum RON ≥ 98) E10 (Benzină COR-98)	8.0	194 789 471	174 573	54	54	19 of 19
Total Petrol		1 488 499 902	1 374 325	104	104	
Diesel fuel B7 (Motorină)	6.5	5 627 881 565	5 757 705	54	54	7 of 7
Total Diesel		5 627 881 565	5 757 705	54	54	

Exceedances of the fuel quality limits

Petrol fuel grades

No exceedances of petrol diesel fuel quality limits were reported.

Diesel fuel grades

Table 3.70 summarizes the parameter for which exceedances were reported for the diesel fuel grades measured.

Table 3.70 Diesel fuel B7 (Motorină)

Parameter	Unit	Limit value	Minimum value measured	Maximum value measured	Number of samples outside tolerance limit	Total number of samples
Density at 15 °C	kg/m³	< 845	829.3	847.0	2	108

3.26 Slovakia

Country details

Responsible organization:	VÚRUP, a.s.
Country size:	Small
Summer period:	1 May to 30 September
FQMS used:	EN 14274 statistical model C
Location of sampling:	Refuelling stations

Fuel quality monitoring service

Sampling
The organization responsible for sampling, analysis and reporting is VÚRUP, a.s. (Accredited Testing Laboratories and Accredited Inspection Body, www.snas.sk/en). Fuel sampling was carried out at refuelling stations only. Fuel sampling was carried out during both summer and winter periods, and the sampling locations were selected from a database of refuelling stations and based on suggestions made by the Slovak Environmental Inspectorate (S.I.E.). The applied monitoring system is equivalent to the CEN system.

Fuel quality monitoring system administration
The public bodies responsible for managing and implementing the FQD are the Ministry of Environment and the Slovak Inspection of Environment. Fuel sampling was carried out by a contracted institution (VÚRUP, a.s.), accredited in accordance with EN ISO/IEC 17020 and EN ISO/IEC 17025, selected by public competition. The annual data concerning the sale of petrol and diesel was provided by the Ministry of the Environment at the end of July 2022 for 2021. Slovakia is a small sized country, using statistical model C (from August 2004), and is defined as one region under this model.
When non-compliant samples were discovered, S.I.E was responsible for acting and imposing financial penalties. S.I.E is responsible for all processes i.e., reporting, managing, and monitoring all non-compliant samples discovered during monitoring. There is one national refinery (the Slovnaft refinery in Bratislava) and two distribution terminals.
The annual fuel quality monitoring data report is provided every year in the due date until the 30th of August.

National legislation that transposed the Fuel Quality Directive
The FQD was transposed into Slovak national law in the form of Directive of the Ministry of Environment No 228/2014 Coll., establishing fuel quality requirements and keeping records of fuel as amended (by Decree No 367/2015 Coll).

Reporting periods
Seasonal periods in Slovakia are as follows:

- summer: from 1 May to 30 September;
- winter: from 16 November to 28/29 February.

Fuel samples were not taken during the transition period, but only during summer and winter period. Therefore, only the results of fuel samples taken during these periods are reported within this annual fuel quality report.

Sales

Table 3.71 Total sales and sample number

Fuel grade (name)	Biofuel content (% v/v)	Total sales		Samples		Parameters measured
		Litres	Tonnes	Summer	Winter	
Unleaded petrol (minimum RON = 95) E10 (Super 95)	7.7	606 297 034	454 723	100	92	19 of 19
Unleaded petrol (minimum RON ≥ 98) E5 (Super Plus 98)	0	115 485 149	86 614	12	27	19 of 19
Total petrol		721 782 183	541 337	112	119	
Diesel fuel B7 (Diesel)	6.9	2 339 847 712	1 965 472	100	116	6 of 7
Total diesel		2 339 847 712	1 965 472	100	116	

Exceedances of the fuel quality limits

Petrol fuel grades

Table 3.72 summarizes the parameters for which one exceedance was reported for the petrol fuel grade measured.

Table 3.72 Unleaded petrol (minimum RON = 95) E10 (Super 95)

Parameter	Unit	Limit value	Minimum value measured	Maximum value measured	Number of samples outside tolerance limit	Total number of samples
Vapour pressure, DVPE	kPa	< 60	54.7	61.8	1	100

Diesel fuel grades

No exceedances of the diesel fuel quality limits were reported.

3.27 Slovenia

Country details

Responsible organization:	Slovenian Environment Agency
Country size:	Small
Summer period:	1 May to 30 September
FQMS used:	EN 14274 statistical model C
Location of sampling:	Refuelling stations and terminals

Fuel quality monitoring service

Sampling

Monitoring is carried out by the legal entities, which obtain authorization from the Ministry of the Environment and Spatial Planning. The main condition for authorization is that they are accredited by Slovenian Accreditation as inspection bodies, in accordance with EN ISO/IEC 17020:2004, and as testing laboratories. They are responsible for the sampling plan, sampling, and analysis of fuel (analysis is undertaken in testing laboratories accredited in accordance with EN ISO/IEC 17025:2005), collecting and processing the data. The publicly available information on legal entities is at the website of Slovenian Environment Agency on the link https://www.gov.si/teme/kakovost-goriv/.

The Slovenian Environment Agency receives annual reports from three independent inspection bodies on regular basis. The samples of petrol fuels, diesel fuel and gas oil are taken throughout the year at refuelling stations and depots.

Fuel quality monitoring system administration

Legislation, implementation, and reporting is exercised by the Ministry of the Environment and Spatial Planning, and within this by the Slovenian Environment Agency. Control of non-compliant samples and other discrepancies is exercised by the Inspectorate for the Environment and Spatial Planning and the Slovenian Maritime Administration, under the Ministry of Infrastructure.

Slovenia is a small sized country, where the FQMS is based on statistical model C. The whole country is considered one region.

National legislation that transposed the Fuel Quality Directive

The FQD was transposed into national law by the Environmental Protection Act and the following regulations (Environmental Protection Act: http://pisrs.si/Pis.web/pregledPredpisa?id=ZAKO1545):

- Decree on the physical and chemical properties of liquid fuels (Uredba o fizikalno-kemijskih lastnostih tekočih goriv: OJ/Uradni list RS, št. 74/11),
- Decree amending the Decree on the physical and chemical properties of liquid fuels (Uredba o spremembah in dopolnitvah Uredbe o fizikalno-kemijskih lastnostih tekočih goriv: OJ/Uradni list RS, št. 64/14),
- Decree amending the Decree on the physical and chemical properties of liquid fuels (Uredba o spremembah in dopolnitvah Uredbe o fizikalno-kemijskih lastnostih tekočih goriv: OJ/Uradni list RS, št. 36/18),
- Decree amending the Decree on the physical and chemical properties of liquid fuels (Uredba o spremembah in dopolnitvah Uredbe o fizikalno-kemijskih lastnostih tekočih goriv: OJ/Uradni list RS, št. 44/22 – ZVO-2),
- Rules on the monitoring of physical and chemical properties of liquid fuels (Pravilnik o monitoringu fizikalno-kemijskih lastnosti tekočih goriv: OJ/Uradni list RS št. 76/11),
- Rules amending the Rules on the monitoring of physical and chemical properties of liquid fuels (Pravilnik o spremembah in dopolnitvah Pravilnika o monitoringu fizikalno-kemijskih lastnosti tekočih goriv: OJ/Uradni list RS št. 56/14),

- Rules amending the Rules on the monitoring of physical and chemical properties of liquid fuels (Pravilnik o spremembah in dopolnitvah Pravilnika o monitoringu fizikalno-kemijskih lastnosti tekočih goriv: OJ/Uradni list RS št. 35/18) and
- Rules amending the Rules on the monitoring of physical and chemical properties of liquid fuels (Pravilnik o spremembah in dopolnitvah Pravilnika o monitoringu fizikalno-kemijskih lastnosti tekočih goriv: OJ/Uradni list RS št. 44/22 – ZVO-2).

Reporting periods
Seasonal periods in Slovenia are as follows:

- summer: from 1 May to 30 September;
- winter: from 1 October to 30 April.

There are no transition periods.

Sales

Table 3.73 Total sales and sample number

Fuel grade (name)	Biofuel content (% v/v)	Total sales		Samples		Parameters measured
		Litres	Tonnes	Summer	Winter	
Unleaded petrol (minimum RON = 95) E5 (NBM 95)	5.0	439 830 577	332 072	54	67	19 of 19
Unleaded petrol (minimum 95 < RON < 98) E5 (NBM 98)	5.0	36 141 907	27 288	10	10	18 of 19
Total petrol		475 972 483	359 359	64	77	
Diesel fuel B7 (B7)	7.0	2 084 205 121	1 761 054	75	118	6 of 7
Total diesel		2 084 205 121	1 761 054	75	118	

Exceedances of the fuel quality limits

Petrol fuel grades
No exceedances of the petrol fuel quality limits were reported.

Diesel fuel grades
Table 3.74 summarizes the parameters for which exceedances were reported for the diesel fuel grades measured.

Table 3.74 Diesel fuel B7 (B7)

Parameter	Unit	Limit value	Minimum value measured	Maximum value measured	Number of samples outside tolerance limit	Total number of samples
Sulphur content	mg/kg		3.6	12.0	1	193
FAME content	% v/v		0.05	12.4	2	193

3.28 Spain

Country details

Responsible organization:	Ministerio para la Transición Ecológica y el reto demográfico
Country size:	Large
Summer period:	1 May to 30 September
FQMS used:	EN 14274 statistical model A
Location of sampling:	Refineries, refuelling stations, and terminals

Fuel quality monitoring service

Sampling

Samples were taken at refineries, terminals and at service stations (point of delivery to final consumers):

- Refineries: samples were taken from five refineries from different regions of the country.
- Terminals: samples were taken from approximately 30 terminals covering the whole country. Samples are taken from storage tanks at atmospheric pressure in accordance with ISO 3170:2004, or near atmospheric pressure.
- Refuelling/service stations: samples were taken from service stations from different regions of the country.

The FQMS has been run during 2021, according to EN 14274 standard in the category of large country and statistical model A. Samples were taken in service stations, storage facilities and refineries to reach sample number required in model A. "Gasolina 98" grade is less than 10% of the total petrol sales and, consequently, less samples were taken. The number of samples out of specification limits were low with no negative trend in quality regarding previous years.

Fuel quality monitoring system administration

Spain is defined as a large sized country regarding fuel sales (more than 15 million tons/year), which uses statistical model A to monitor fuel quality. In some regions there is more potential variability due to product coming in by ship cargo. The country is divided into regions considering the refineries and the terminals. There are nine refineries in the country and samples were taken from five of them. Also, samples were collected from more than 30 terminals, covering the whole country, and including samples from every refinery. Samples taken from service stations cover most of the country. For fuels that came into Spain by ship, the variability factor was considered. The service stations from which samples have been taken cover great part of the Spanish territory.

National legislation that transposed the Fuel Quality Directive

Fuel quality specifications were transposed into Spanish law in Royal Decree RD 61/2006 and RD 1088/2010. Sampling and analysis specifications were transposed in Article 7 of RD 61/2006.

Reporting periods

Seasonal periods in Spain are as follows:

- summer: petrol from 1 May to 30 September; diesel from 1 April to 30 September;
- winter: petrol from 1 October to 30 April; diesel from 1 October to 30 March.

A vapour pressure derogation has been granted to Spain until 31 December 2023 for more detail see C(2021) 1909 final. . Samples were taken and tested during transition periods.

Sales

Table 3.75 Total sales and sample number

Fuel grade (name)	Biofuel content (% v/v)	Total sales		Samples		Parameters measured
		Litres	Tonnes	Summer	Winter	
Unleaded petrol (minimum RON = 95) E5 (Gasolina 95)	3.37	6 476 092 554	4 870 022	103	102	19 of 19
Unleaded petrol (minimum RON ≥ 98) E5 (Gasolina 98)	3.37	496 017 873	373 005	14	15	19 of 19
Total petrol		6 972 110 427	5 243 027	117	117	
Diesel fuel B7 (Gasóleo A)	6.5	25 815 880 260	21 814 419	104	102	7 of 7
Total diesel		25 815 880 260	21 814 419	104	102	

Exceedances of the fuel quality limits

Petrol fuel grades

Table 3.76 and Table 3.77 summarize the parameters for which exceedances were reported for the petrol fuel grades measured.

Table 3.76 Unleaded petrol (minimum RON = 95) E5 (Gasolina 95)

Parameter	Unit	Limit value	Minimum value measured	Maximum value measured	Number of samples outside tolerance limit	Total number of samples
Vapour pressure	kPa	< 60	46.2	69.2	3	198
Aromatics	% v/v	< 35	20.6	37.3	1	198
Methanol	% v/v	< 3	0	4.8	1	164

Table 3.77 Unleaded petrol (minimum RON ≥ 98) E5 (Gasolina 98)

Parameter	Unit	Limit value	Minimum value measured	Maximum value measured	Number of samples outside tolerance limit	Total number of samples
Vapour pressure	**kPa**	**< 60**	**52.8**	**75.1**	**1**	**29**

Diesel fuel grades

Table 3.78 summarizes the parameter for which exceedances were reported for the diesel fuel grade measured.

Table 3.78 Diesel fuel B7 (Gasóleo A)

Parameter	Unit	Limit value	Minimum value measured	Maximum value measured	Number of samples outside tolerance limit	Total number of samples
FAME Content	% v/v	< 7	0	7.8	2	186

3.29 Sweden

Country details

Responsible organization:	The Swedish Transport Agency
Country size:	Small
Summer period:	1 May to 15 September in the south of Sweden; 16 May to 31 August in the north of Sweden
FQMS used:	National system
Location of sampling:	Terminals, refuelling stations

Fuel quality monitoring service

Sampling

The Swedish fuel quality model is based on a national system. Drivkraft Sverige (the former Swedish Petroleum and Biofuels Institute) compiles the data at the terminals for this annual Fuel Quality Monitoring Report, on behalf of The Swedish Transport Agency. The quality assessment system at the terminals consists of compilation of quality data of all batches produced in Sweden and of all import batches for the Swedish market. The number of samples taken per fuel grade at the terminals could be found in the tab Sales as well as in each respective tab, for the respective grade, in column N-samples in this report. In 2021, there were 666 samples of Unleaded Petrol 95, 98 samples of Unleaded Petrol 98 and 919 samples of diesel taken at the terminals. Unleaded Petrol 98 represents only about 3.3% of the total sales of petrol in Sweden. The reported data at the terminals represents more than 98% of the sales of petrol and diesel in Sweden.

In 2021, (representing summer quality), The Swedish Transport Agency, as an assessment of the national monitoring system's equivalency to the CEN system (crosschecking), carried out sampling at actual refuelling stations with the help of an accredited test laboratory. Five samples of unleaded petrol 95 and five samples of diesel, where taken at five actual fuel dispensing sites in five cities distributed across Sweden. The cities were (from north to south): Gävle, Nynäshamn, Kolmården, Göteborg and Malmö.

The refuelling stations also represented five different fuel companies. The samples where then analysed according to the same test methods as in the excel template and to what is required in SS-EN 14274:2003 and SS-EN 14275:2003. The samples from the refuelling stations (crosschecking) showed good equivalency for both petrol and diesel with this report based upon quality data of the deliveries to the terminals. The analysis report for the crosschecking at refuelling stations in 2021 is available from The Swedish Transport Agency upon request. The same goes for the analysis reports from 2012-2020. The Swedish Transport Agency plans to do a similar crosschecking at the actual refuelling stations in the summer of 2022 to also verify the upcoming 2022 FQMS Report.

Fuel quality monitoring system administration

The Swedish Transport Agency is responsible for managing and implementing most parts (including fuel quality) of the FQD except from the parts of the Directive dealing with GHG emission reductions and sustainability criteria for biofuels (i.e., Article 7(a)-7(d)). The Swedish Energy Agency is responsible for Article 7(a)-7(d) of the FQD. This FQMS report is, in other words, under the responsibility of the Swedish Transport Agency with compilation of quality data at the terminals for the annual FQMS report. Sampling and subsequent analysis for the additional national monitoring is carried out by accredited test laboratories.

The Swedish Transport Agency verified the reliability of the compilation of Drivkraft Sverige (the former Swedish Petroleum and Biofuel Institute) for this 2021 fuel quality report. The sampling at the actual refuelling stations in 2021 (representing summer quality), showed good conformity for both petrol and diesel with the data at the terminals in this annual Fuel Quality Monitoring Report. From authority side,

Drivkraft Sverige (the former Swedish Petroleum and Biofuels Institute) compilation of quality data for the FQMS Report gives a correct picture of the fuel quality situation in Sweden for 2021. There are no indications that the fuel quality was a problem in 2021.
Fuels and fuel quality are managed through the national Swedish legislation; "Drivmedelslag (2011:319) the law" and "Drivmedelsförordning (2011:346) the regulation". According to 14 § in Drivmedelsförordning (2011:346), The Swedish Transport Agency is, according to the national fuel regulation, the authority responsible for acting where non-compliant samples are discovered.
The main reason for Sweden to choose this national system is the considerable costs associated with the extensive sampling in a large, sparsely populated Member State with long geographical distances. There are also substantial annual costs associated with the analysis of the large number of samples per fuel grade required by the statistical model in question according to the European Standard EN 14274:2003. This was agreed by the European Commission, Directorate-General of Climate Action and the Swedish Ministry of the Environment and Energy, in October 2014, by means of EU-pilot 6321/14/CLIM.
There are three national refineries in Sweden, producing automotive fuels and 32 distribution terminals.
Sweden submits the report of its national fuel quality data for the preceding calendar year by the 31st of August, each year.

National legislation that transposed the Fuel Quality Directive
In Sweden, the legislation of the FQD was transposed into the national law “Drivmedelslag (2011:319)”, the national regulation “Drivmedelsförordning (2011:346)” and regulations adopted by The Swedish Transport Agency (Transportstyrelsens föreskrifter (TSFS 2011:66) och allmänna råd om informationskrav avseende tillsatser i drivmedel and TSFS 2015:14, Föreskrifter om ändring i Transportstyrelsens föreskrifter och allmänna råd (TSFS 2011:66) om informationskrav avseende tillsatser i drivmedel). The latter requires appropriate information to consumers concerning the biofuel, in particular FAME, content of diesel fuel in Article 4.1 of the FQD. This is according to EU-pilot 6321/14/CLIM. In addition to that, TSFS 2011:66 and TSFS 2015:14 also contain a demand for information to customers about other additives (ethanol content in Article 3.3 and metallic additives in Article 8a of the FQD). The law Drivmedelslag (2011:319) was also amended to incorporate the limit of 2 mg per litre of methylcyclopentadienyl manganese tricarbonyl (MMT) in diesel fuel. This is in accordance with the Article 8(a)2 of the FQD.
The law “Drivmedelslag (2011:319)” contains, among other things, fuel specifications (Article 3 and 4 of the FQD) and standard references among them SS-EN 228. In 4-6 §§, the environmental classes for petrol (bensin) can be found. There are two environmental classes for petrol in Sweden. Petrol environmental class 1, in the law, equals the former national standard SS 155422. This standard is now included as a national Appendix of EN 228. Under the headline Bensin i miljöklass 2 (Petrol in Environmental class 2) is petrol that equals EN 228 and ANNEX 1 of the FQD found. Sweden also has three environmental classes for diesel. Environmental class 1 and 2 for diesel equals the national standard SS 155435. In 8-10 §§ the environmental classes for diesel can be found. Diesel Environmental class 3 in the law, equals EN 590 and ANNEX II of the FQD. Environmental class 1 of both petrol and diesel represents the largest volumes of those fuels sold on the Swedish market.
The specific regulation about this annual FQMS Report, Article 8 in the FQD, is found in 19 § of the national law Drivmedelslag (2011:319) and in 7-8§§ of the national regulation Drivmedelsförordning (2011:346).

Reporting periods
Seasonal periods in Sweden are as follows:

- summer: from 1 May to 15 September in the south and from 16 May to 31 August in the north;
- winter: from 1 November to 15 March in the south and from 16 October to 31 March in the north.

A vapour pressure derogation has been granted to Sweden because of the low ambient summer temperature (maximum is 70 kPa) till 31 December 2030 (for more detail, see C(2021) 1885 final).
Transition periods between summer and winter grades of petrol vary between the northern and the southern parts of Sweden. The summer and winter periods are regulated in the national law (Drivmedelslag (2011:319)) and the transition periods are considered for the fuel quality report. The transition periods for the south are 16 September to 31 October and 16 March to 1 April. For the northern parts of Sweden, the transition periods are 1 September to 15 October and 1 April to 15 May.

Sweden has the same diesel fuel quality the whole year around. There are no winter and summer periods for diesel and no transition periods between winter and summer. The reported data for diesel are, therefore, only an administrative allocation to facilitate comparison between Member States.

Sales

Table 3.79 Total sales and sample number

Fuel grade (name)	Biofuel content (% v/v)	Total sales		Samples		Parameters measured
		Litres	Tonnes	Summer	Winter	
Unleaded petrol (minimum RON = 95) E5 (Blyfri 95)	5.0	202 620 577	151 965	206	159	13 of 19
Unleaded petrol (minimum RON = 95) E10 (Blyfri 98)	10.0	2 496 224 224	1 872 168	105	196	13 of 19
Unleaded petrol (minimum RON ≥ 98) E5 (Blyfri 98)	5.0	6 914 663	5 186	75	23	13 of 19
Total petrol		2 705 759 464	2 029 319	386	378	
Diesel fuel B7 (Diesel Mk1)	7.0	6 003 873 800	4 887 153	487	432	6 of 7
Total diesel		6 003 873 800	4 887 153	487	432	

Exceedances of the fuel quality limits

Petrol fuel grades
No exceedances of the petrol fuel quality limits were reported.

Diesel fuel grades
No exceedances of the diesel fuel quality limits were reported.

3.30 United Kingdom (Northern Ireland)

Country details

Responsible organization:	Department for Transport
Country size:	Large
Summer period:	1 June to 31 August
FQMS used:	National system
Location of sampling:	Refineries, terminals, and refuelling stations

Fuel quality monitoring service

Sampling
Sampling is done at refineries, terminals, and refuelling stations. Samples are done routinely throughout the year and across all regions of the UK, including Northern Ireland. The numbers for each month are shown in the petrol and diesel sheets showing the test results. The test methods used are in accordance with EN 228 and EN 590 European standards.

Fuel quality monitoring system administration
The Department for Transport has responsibility for the implementing of the FQD for Northern Ireland and oversees of the FQMS. The UK fuel quality monitoring system makes use of industry quality analyses on batches of fuel produced in, or imported into, Northern Ireland and the UK as a whole, plus samples taken at distribution terminals and forecourts (to check the contamination in the distribution network). Due to the very large number of samples involved, this approach provides an equivalent, or greater, degree of confidence to EN 14274. There are six operational fuels refineries within the UK and approximately 50 distribution terminals.

National legislation that transposed the Fuel Quality Directive
The FQD is transposed in the UK law, under the Motor Fuel (Composition and Content) Regulations 1999 (SI No. 3107) with amendments in 2001, 2003, 2007, 2010, 2012, and 2021. The FQD is listed under the Protocol on Ireland/Northern Ireland, Annex 1, Section 26 (Environment, Energy Efficiency).

Reporting periods
Seasonal periods in the UK are as follows:

- summer: from 1 June to 31 August;
- winter: from 1 September to 31 May.

The vapour pressure derogation is no longer applicable.

Sales

Table 3.80 Total sales and sample number

Fuel grade (name)	Biofuel content (% v/v)	Total sales		Samples		Parameters measured
		Litres	Tonnes	Summer	Winter	
Unleaded petrol (minimum RON = 95) E10 (Premium 95 RON)	10.0	440 445 281	287 023	344	499	19 of 19
Unleaded petrol (minimum 95 < RON < 98) E5 (Super 97 + RON)	5.0	54 838	40 487	52	90	19 of 19
Total petrol		440 500 119	327 509	396	589	
Diesel fuel B7 (Diesel)	7.0	841 731 865	698 533	1 741	1 069	7 of 7
Total diesel		841 731 865	698 533	1 741	1 069	

Exceedances of the fuel quality limits

Petrol fuel grades

Table 3.81 and Table 3.82 summarize the parameters for which exceedances were reported for the petrol fuel grades measured.

Table 3.81 Unleaded petrol (minimum RON = 95) E10 (Premium 95 RON)

Parameter	Unit	Limit value	Minimum value measured	Maximum value measured	Number of samples outside tolerance limit	Total number of samples
Research Octane Number	--	> 95	94.2	99.5	6	843
Oxygen content	% m/m	< 3.7	0.13	4.05	1	666

Table 3.82 Unleaded petrol (minimum 95 < RON < 98) E5 (Super 97 + RON)

Parameter	Unit	Limit value	Minimum value measured	Maximum value measured	Number of samples outside tolerance limit	Total number of samples
Aromatics	% v/v	< 35	18.3	36.9	3	114

Diesel fuel grades

No exceedances of the diesel fuel quality limits were reported.

List of abbreviations, symbols, and units

% m/m	Percentage mass per mass
% v/v	Percentage volume per volume
˚C	Degree Celsius
B+	Diesel with > 7% biodiesel content
B0	Diesel with no biodiesel content
B7	Diesel with up to 7% biodiesel content
CNG	Compressed natural gas
CO_2	Carbon dioxide
DVPE	Dry Vapour Pressure Equivalent
E+	Petrol with > 10% ethanol content
E0	Petrol with no ethanol content
E10	Petrol with up to 10% ethanol content
E5	Petrol with up to 5% ethanol content
EEA	European Environment Agency
Eionet	European Environment Information and Observation Network
ETBE	Ethyl tert-butyl ether
ETC CM	European Topic Centre for Air Pollution and Climate Change Mitigation
EU	European Union
FAME	Fatty acid methyl esters
FQD	Fuel Quality Directive
FQMS	Fuel quality monitoring system
GHG	Greenhouse gas
kg	kilogram
kPa	kilopascal
LPG	Liquid petroleum gas
mg	milligram
MON	Motor octane number
N/A	Not available
QA/QC	Quality assurance/quality control
RON	Research octane number

European Topic Centre on
Climate change mitigation

https://www.eionet.europa.eu/etcs/etc-cm

The European Topic Centre on Climate change mitigation (ETC-CM) is a consortium of European institutes under contract of the European Environment Agency.

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