Fuel quality monitoring in the EU in 2019

Fuel quality monitoring under the Fuel Quality Directive

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1 Quality of fuels

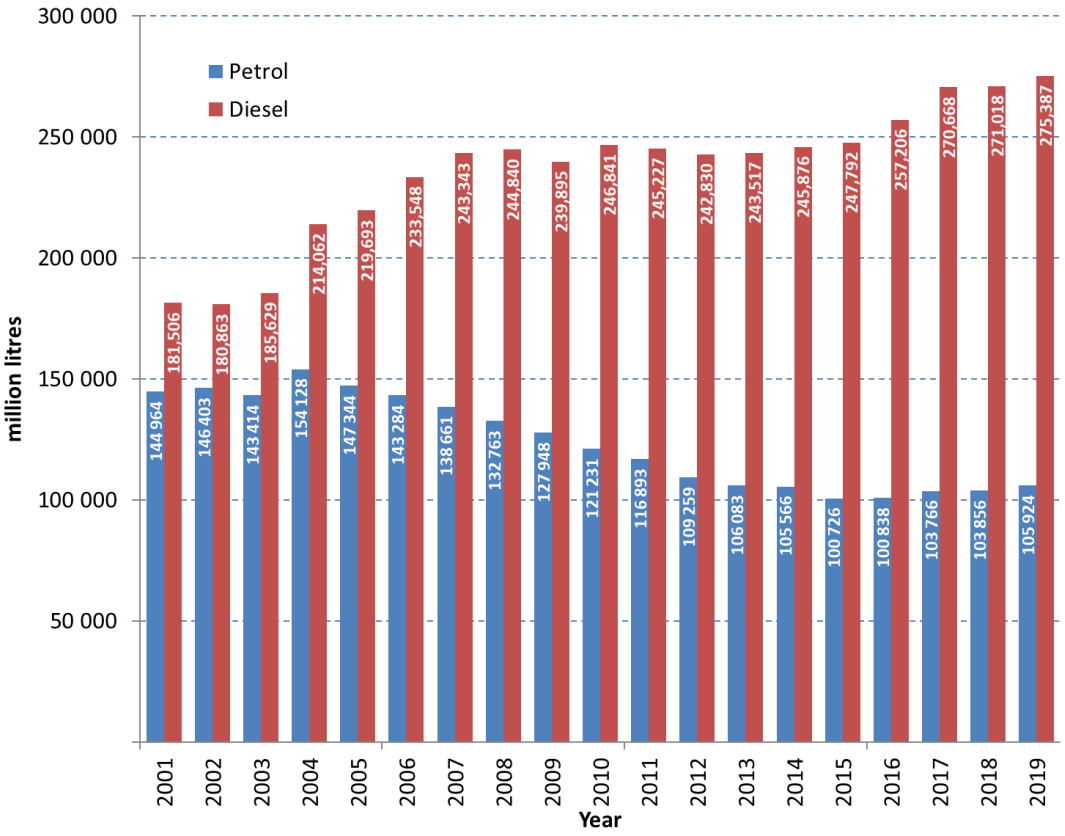
1.1 Fuel sales

Sales of fuels used for road transport in the EU continue to be dominated by diesel: 72 % (275 387 million litres) of fuel sold was diesel and 28 % was petrol (105 924 million litres) ([1]). Petrol and diesel sales in 2019 remained on the same levels when compared with 2018 (Figure 1.1).

The proportion of diesel in total fuel sales has increased over the years, from 55.6 % of total sales in 2001 to 72.2 % in 2019 (Figure 1.2). This reflects to a large degree the increasing dieselisation of Europe's vehicle fleet during that period. While sales of diesel fuel increased by 14.8 % between 2009 and 2019, sales of petrol fuels decreased by 17.2 % during the same period.

Diesel and petrol vehicles are very similar in terms of CO_2 emissions produced per mass of fuel consumed. Whereas diesel cars are more fuel efficient, they tend to be bulkier and heavier than petrol cars, eventually emitting similar amounts of CO_2 per kilometre travelled as petrol cars ([2]).

Figure 1.1 EU petrol and diesel fuel sales in 2019 (million litres)



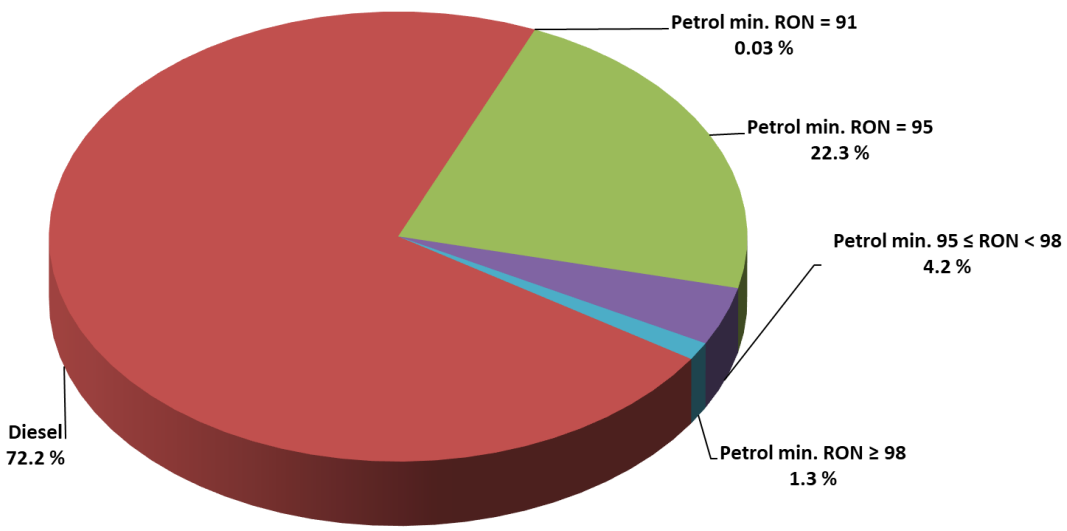
([1]) Fuels other than petrol and diesel are disregarded here, as the reporting under Article 8 of the Fuel Quality Directive (FQD) is limited to petrol and diesel, for which fuel specifications are laid down in Annexes I and II of the FQD.

([2]) Average CO2 emissions from new cars and new vans increased in 2018 — European Environment Agency (europa.eu)
https://www.eea.europa.eu/publications/monitoring-co2-emissions-from-new-2/download

The majority of petrol sales in 2019 comprised fuels with a petrol grade research octane number (RON) of 95, which accounted for 80.2 % of the total petrol fuel sales; 15.1 % of sales were 95 ≤ RON < 98; and 4.6 % were RON ≥ 98. There was an insignificant proportion of RON 91 grade sales .

Higher RON prevents engine knock in higher performance cars which can lead to engine damage and hence higher emissions. For most cars higher RON does not have any significant effect on fuel economy or emissions ([3]).

Figure 1.2 EU petrol and diesel fuel sales, 2019 (% litres)



Diesel fuel consumption is dominant (> 60 % of total fuel sales) in most Member States, apart from Cyprus, Greece and the Netherlands (Table 1.1).

The ten Member States with the highest volumes of fuel sold account for 81 % of total EU sales, while the remaining 18 Member States with the lowest volumes account for 19 % of total EU fuel sales.

([3]) https://www.fuelsandlubes.com/fli-article/the-influence-of-fuel-octane-on-fuel-consumption/
https://www.consumer.ftc.gov/articles/0210-paying-premium-high-octane-gasoline
https://www.concawe.eu/publication/phase-2-effect-of-fuel-octane-on-the-performance-of-four-euro-5-and-euro-6-gasoline-passenger-cars/rpt-no-7-19/

Table 1.1 Fuel sales by Member State and fuel type in 2019

Member State	Minimum RON = 91	Minimum RON = 95	95 ≤ RON < 98	RON ≥ 98	Total petrol	Total diesel
			million litres			
Austria	19	0	2 078	113	2 210	8 416
Belgium	0	0	2 065	527	2 592	7 686
Bulgaria	0	0	625	56	681	2 716
Croatia	0	611	0	43	655	2 145
Cyprus	0	418	0	35	452	399
Czechia	0	2 093	0	60	2 153	6 005
Denmark	82	1 652	0	59	1 793	3 276
Estonia	0	0	196	107	303	942
Finland	0	1 332	0	532	1 864	3 087
France	0	11 646	0	0	11 646	39 157
Germany	0	22 844	0	1 111	23 954	45 057
Greece	0	2 719	0	329	3 049	3 279
Hungary	0	1 849	0	135	1 984	4 510
Ireland	0	1 374	0	0	1 374	3 723
Italy	0	8 256	0	0	8 256	30 820
Latvia	0	205	0	0	205	1 223
Lithuania	0	0	333	9	341	2 146
Luxembourg	0	370	0	111	480	1 912
Malta	0	109	0	3	112	195
Netherlands	0	0	5 682	89	5 771	7 786
Poland	0	5 823	0	532	6 356	20 865
Portugal	0	0	1 314	116	1 430	5 488
Romania	0	0	1 681	223	1 904	7 703
Slovakia	0	0	721	38	759	2 421
Slovenia	0	0	497	43	540	2 303
Spain	0	6 616	0	532	7 148	27 661
Sweden	0	2 809	0	96	2 904	5 945
United Kingdom	0	14 238	769	0	15 007	28 523
EU28	101	84 964	15 962	4 898	105 924	275 387

1.2 Use of biocomponents

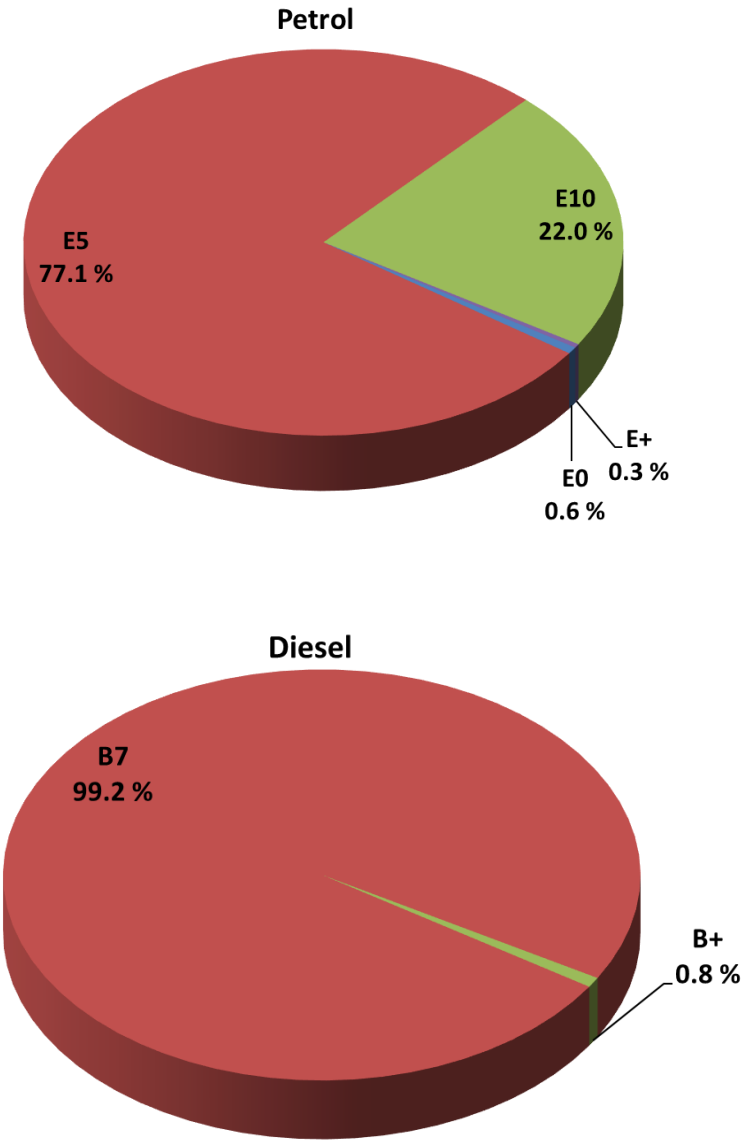
Almost all fuel sold in the EU in 2019 contained biocomponents (Figure 1.3). All diesel sold in the EU contained biodiesel, whereas nearly 100 % of petrol sold contained bioethanol ([4]).

Of petrol sold in the EU in 2019, 77.1 % 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 22 % was E10 (i.e. up to 10 % ethanol content by volume) and 0.6 % was E0 (no ethanol content). Only 0.3 % of petrol was E+ (i.e. > 10 % ethanol content by volume). This refers mainly to E85, used in engines modified to accept a higher content of ethanol. Such flexi-fuel vehicles (FFV) are designed to run on any mixture of petrol and ethanol with up to 85 % ethanol by volume.

All diesel sold in the EU contained biodiesel, while 99.2 % was of the B7 product type (i.e. containing up to 7 % fatty acid methyl esters, FAME) and 0.8 % was of the B+ product type (i.e. containing more than 7 % FAME).

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

Figure 1.3 Use of biocomponents in petrol and diesel fuels sold in the EU in 2019 (% litres).



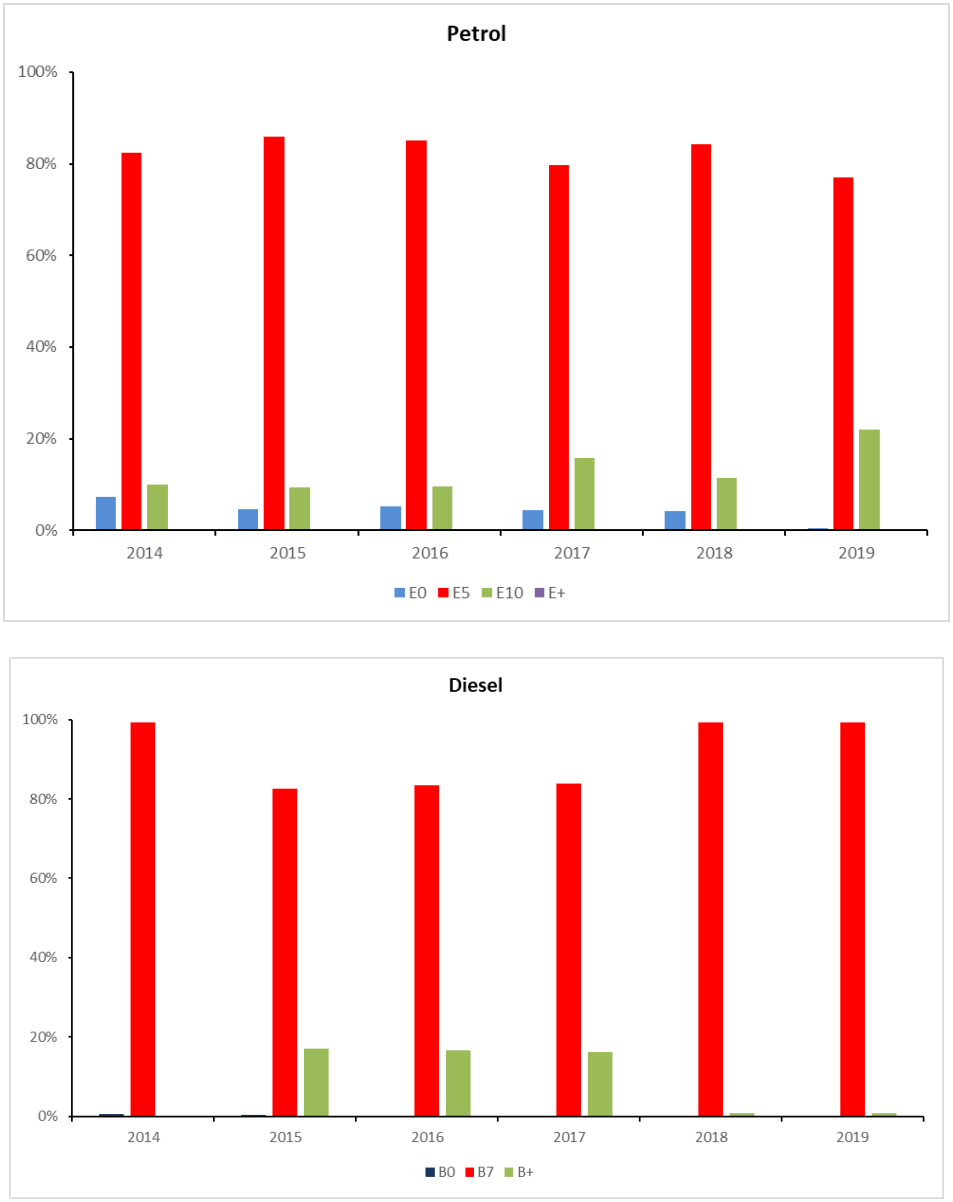
The share of ethanol-containing petrol (E5 and E10) in the EU has increased over the last five years, from about 92 % in 2014 to more than 99 % in 2019, as illustrated in Figure 1.4. The share of non ethanol-containing petrol (E0) has decreased even further reaching only 0.6 % compared to 2018 (4.1 %) as Greece and Croatia have introduced ethanol in petrol in 2019.

Almost all diesel contained different levels of biodiesel over the same period. B+ changes significantly from 2014 to 2015 and from 2017 to 2019 because of changes in the French legislation allowing the share of biodiesel to be above 7 % between 2015 and 2017.

Whereas the use of different biocomponents results in lower overall greenhouse gas (GHG) emissions, the reductions achieved depends greatly on the feedstock used for the production of biofuels as well as on the actual production pathways ([5]).

([5]) https://www.eionet.europa.eu/etcs/etc-cme/products/etc-cme-reports/etc-cme-report-2-2020-greenhouse-gas-intensities-of-transport-fuels-in-the-eu-in-2018-monitoring-under-the-fuel-quality-directive

Figure 1.4 Biocomponent in petrol and diesel sold in the EU from 2014 to 2019 (% 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.

1.3 Monitoring systems and sampling methods

Table 1.2 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 1.2 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	106	100
Belgium	National system	Small	Yes	National system	National system
Bulgaria	Statistical model A	Small	Yes	109	100
Croatia	Statistical model C	Small	Yes	107	100
Cyprus	Statistical model C	Small	Yes	110	100
Czechia	Statistical model C	Small	Yes	105	100
Denmark	Statistical model C	Small	Yes	109	100
Estonia	Statistical model C	Small	Yes	200	100
Finland	Statistical model A	Small	Yes	200	100
France	Statistical model A	Large	Yes	411	200
Germany	Statistical model B	Large	Yes	823	400
Greece	Statistical model A	Small	Yes	202	100
Hungary	Statistical model C	Small	Yes	107	100
Ireland	Statistical model C	Small	Yes	100	100
Italy	Statistical model A	Large	Yes	200	200
Latvia	National system	Small	Yes	National system	National system
Lithuania	Statistical model C	Small	Yes	102	100
Luxembourg	National system	Small	Yes	National system	National system
Malta	Statistical model C	Small	Yes	102	100
Netherlands	Statistical model A	Small	Yes	102	100
Poland	Statistical model B	Large	Yes	520	400
Portugal	Statistical model C	Small	Yes	108	100
Romania	Statistical model B	Small	Yes	102	100
Slovakia	Statistical model C	Small	Yes	106	100
Slovenia	Statistical model C	Small	Yes	108	100
Spain	Statistical model A	Large	Yes	216	200
Sweden	National system	Small	Yes	National system	National system
United Kingdom	National system	Large	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 14274:2003.

1.3.1 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 1.3) 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.

Twenty-two Member States used one of the three statistical models defined by the European Standard EN 14274:2003. Five Member States (Belgium, Latvia, Luxembourg, Sweden and the United Kingdom) used a national monitoring system.

Table 1.3 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, a large number of samples per grade is 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.

1.3.2 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. Apart from Romania, 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 ([6]), during the summer period only. Vapour pressure derogations have been granted to 9 Member States ([7]) upon their request, either due the effect of ethanol blending (for Bulgaria and Spain) or due to low ambient summer temperature (for Denmark, Estonia, Finland, Ireland, Latvia, Spain, Sweden and United Kingdom) ([8]).

1.3.3 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 1.4.

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:

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

(6) According to Annex I and III of FQD for petrol.
(7) https://ec.europa.eu/clima/policies/transport/fuel_en#tab-0-1
(8) 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) .

Table 1.4 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

1.4 Exceedances of fuel quality limits

Most key fuel parameters in the samples taken in 2019 were within the tolerance limits. In total, 374 non-compliances for petrol and 134 for diesel were reported for 2019 (Table 1.5).

One Member State (Belgium) reported more than 200 non-compliances for petrol and 88 for diesel in 2019. Despite this large number of non-compliances, it represents only a small fraction of the overall number of samples taken in Belgium, which is 8 031.

Twenty Member States reported fewer than 10 non-compliances for petrol, five of which have reported full compliance (Ireland, Lithuania, Malta, Slovenia and Sweden). Exceedances of the summer vapour pressure were reported in 16 Member States, exceedances of the research octane number (RON) were reported in ten Member States, exceedances of the motor octane number (MON) were reported in three Member States, and exceedances of sulphur content were reported in four Member States.

Twenty-six Member States reported fewer than 10 non-compliances for diesel, eleven of which reported full compliance (Austria, Croatia, Denmark, Estonia, Finland, Lithuania, Luxembourg, Portugal, Romania, Slovenia and Sweden). Of the seven fuel parameters that require testing and analysis ([9]), the most common parameters falling outside the specifications were the sulphur content (in thirteen Member States) and the FAME content (in eleven Member States).

All Member States have described the actions taken when non-compliant samples were identified. These included informing the competent authorities, initiating investigations, imposing penalties and fines or resampling. 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.

(9) 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 1.5 Number of non-compliances for petrol and diesel fuels by country in 2019

Member State	Samples taken (and samples required in brackets)		Number of non-compliances in 2019 (figures for 2018 in brackets)		Parameters outside tolerance limits for non-compliant samples
	Petrol	Diesel	Petrol	Diesel	
Austria	106 (106)	100 (100)	12 (3)	0 (0)	Vapour pressure, Oxygenates (Ethanol), Oxygenates (Ethers with ≥5 carbon atoms/molecule)
Belgium	4 367 (National system)	3 664 (National system)	234 (141)	88 (30)	RON, MON, Vapour pressure, Distillation evaporated at 100 °C, Aromatics, Oxygen content, Oxygen content (petrol with 5 % (v/v) or less ethanol content), Oxygenates (Ethanol), Cetane number, Diesel Density at 15 °C, Diesel Distillation 95 %-point, Diesel Sulphur content, FAME content
Bulgaria	127 (109)	112 (100)	3 (0)	2 (1)	Oxygen content, Distillation evaporated at 100 °C, Diesel Distillation 95 %-Point, Diesel Sulphur content
Croatia	193 (107)	203 (100)	2 (4)	0 (0)	Aromatics, Vapour pressure
Cyprus	583 (110)	338 (100)	4 (1)	3 (3)	RON, FAME content
Czechia	1 010 (105)	1 302 (100)	12 (25)	2 (3)	Vapour pressure, Diesel Sulphur content, FAME content
Denmark	112 (109)	100 (100)	10 (21)	0 (1)	Vapour pressure, Aromatics
Estonia	245 (200)	173 (100)	2 (3)	0 (0)	Vapour pressure
Finland	209 (200)	104 (100)	1 (3)	0 (0)	Vapour pressure
France	435 (411)	226 (200)	22 (10)	2 (9)	RON, Vapour pressure, Oxygenates (Ethanol), Oxygen content, FAME content
Germany	765 (822)	466 (400)	5 (3)	2 (0)	Olefins, Oxygenates (Ethanol), Vapour pressure, Aromatics, Diesel Sulphur content, FAME Content
Greece	114 (202)	100 (100)	4 (0)	14 (19)	RON, Distillation evaporated at 100 °C, Oxygen content (petrol with 5 % (v/v) or less ethanol content), Sulphur content, Diesel Density at 15 °C, Diesel Distillation 95 %-Point, Diesel Sulphur content, FAME Content
Hungary	120 (107)	120 (100)	3 (3)	1 (0)	Vapour pressure, Aromatics, Diesel Sulphur content
Ireland	100 (100)	100 (100)	0 (1)	3 (0)	FAME Content
Italy	275 (200)	337 (200)	1 (5)	1 (2)	RON, FAME Content
Latvia	35 (National system)	48 (National system)	5 (0)	1 (1)	RON, Diesel Sulphur content
Lithuania	104 (102)	100 (100)	0 (0)	0 (0)	-
Luxembourg	126 (National system)	62 (National system)	2 (13)	0 (1)	Vapour pressure
Malta	111 (102)	103 (100)	0 (3)	1 (1)	Diesel Sulphur content
Netherlands	100 (102)	102 (100)	4 (0)	3 (0)	Vapour Pressure, Benzene, Diesel Distillation 95 %-Point, Diesel Sulphur content, FAME Content

Member State	Samples taken (and samples required in brackets)		Number of non-compliances in 2019 (figures for 2018 in brackets)		Parameters outside tolerance limits for non-compliant samples
	Petrol	Diesel	Petrol	Diesel	
Poland	593 (437)	430 (400)	4 (11)	1 (0)	Vapour Pressure, RON, Aromatics, Diesel Sulphur content
Portugal	62 (108)	140 (100)	14 (60)	0 (5)	RON, MON, Aromatics, Oxygen content (petrol with 5 % (v/v) or less ethanol content), Sulphur content
Romania	108 (102)	108 (100)	3 (-)	0 (0)	-
Slovakia	243 (106)	220 (100)	4 (11)	4 (31)	RON, MON, Vapour Pressure, Cetane number, Diesel Sulphur content, FAME content
Slovenia	133 (108)	177 (100)	0 (0)	0 (0)	-
Spain	222 (216)	200 (200)	11 (15)	3 (3)	RON, Vapour Pressure, Aromatics, Benzene, Sulphur content, Diesel Sulphur content
Sweden	720 (National system)	825 (National system)	0 (0)	0 (0)	-
United Kingdom	1 291 (National system)	2 402 (National system)	12 (16)	3 (4)	Vapour Pressure, Aromatics, Sulphur content, Diesel Sulphur content, FAME content
Total			**374(355)**	**134 (114)**	

1.5 Quality of Member States' reporting in 2019

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/ACM).

In 2019, 28 EU Member States plus Norway submitted their fuel quality reports in accordance with the requirements of Article 8 of the FQD.

22 Member States submitted their first report within the deadline (August 31, 2020).The latest submission was received on 18th December 2020. There were no outstanding issues, except regarding an uncertainty in Romanian fuel sales[10].

During the QA/QC procedure, the ETC/ACM reviewers posed in total 112 questions to EU Member States, relating to the completeness and consistency of their submitted data sets. The most common findings communicated to Member States following the quality checks performed on the information reported were:

- no fuel sales reported in the regional sampling sheets;
- national fuel sales and numbers of samples not consistent with the corresponding regional data;
- missing values for various fuel parameters;

([10]) In the Romanian dataset the order of magnitude of petrol sales for 2019 is different compared to the 2018 sales. In addition diesel sales for 2019 are almost three times higher than the diesel sales of 2018. Also, the reported petrol fuel grades are different than those of last year. Romania claims that there was a shift '*between the old and new reporting formats and quantities of petrol and diesel were interpreted differently based on each economic operator interpretation'* (Email from MINISTRUL ENERGIEI, 18.12.2020). No further justifications were provided, while requested in EEA's feedback on 21.12.2020.

- 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 Member States during the communication process, by their completing missing information, correcting erroneous values or providing the necessary clarifications to comments. Following the QA/QC procedure, 23 Member States submitted revised data sets. The last resubmission was received on 13th January 2021.

2 Summary of Member States' submissions

2.1 Austria

2.1.1 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:	Refueling stations / Fuel dispensing sites

2.1.2 Fuel quality monitoring service

Sampling

The organisation responsible for sampling is Agrar Market Austria (AMA), analyzing 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 3 campaigns are undertaken – two in winter (begin 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 Sustainability and Tourism). 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 analyzing. Reporting starts when all samples of the previous year were tested. After analyzing 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 cause 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 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 Ethyl tert-butyl ether (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 1st and 31st of October and between the 1st of March and the 30th of April. Samples taken within the transition periods are regarded ls "winter"- samples. They are part of the FQMS.

2.1.3 Sales

Table 2.1 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)	4.71	18 555 166	13 960	3	0	19 of 19
Unleaded petrol (minimum 95 ≤ RON < 98) E5 (Super)	4.8	2 078 284 980	1 550 448	50	50	19 of 19
Unleaded petrol (minimum RON ≥ 98) E5 (Super Plus)	4.61	113 392 777	85 463	3	0	8 of 19
Total petrol		2 210 232 923	1 649 871	56	50	
Diesel fuel B7 (Diesel)	6.3	8 416 441 161	7 047 430	50	50	6 of 7
Total diesel		8 416 441 161	7 047 430	50	50	

2.1.4 Exceedances of the fuel quality limits

Petrol fuel grades

Table 2.2 summarizes the parameters for which exceedances were reported for petrol fuels.

Table 2.2 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	56.8	91.1	2	100

Diesel fuel grades

No exceedances of the diesel fuel quality limits were reported.

2.2 Belgium

2.2.1 Country details

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

2.2.2 Fuel quality monitoring service

Sampling

The ISO EN 17020 certified organisation, Fapetro, is responsible for the reporting of the fuel quality in Belgium. Belgium uses a national system instead of the statistical models. It leaves no doubt this certified organisation goes further than the national model. Belgium takes samples at refueling stations, depots and pomps with private owners. Only samples for refueling 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, thus mainly diesel samples are taken.
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 analyzed parameter and method, standard for every fuel type.
Only a very small number of samples were non-compliant, due to involuntary contamination.
Belgium uses the ISO 4259 standard for the interpretation of the analysis results from 1 January 2009.
Samples were taken in compliance with EN 14275, latest version.
All the samples were analyzed by labs that were ISO 17025 certified. All the used test methods are accredited or the demand for accreditation is in progress.
Above that, Fapetro also conducts twice a year an audit in the labs to reassure itself of the quality of the reported analyzed samples.
Pump labelling is regulated by national legislation.

Fuel quality monitoring system administration

All the information can be found in the answer above and procedures on demand.
The deadline mentioned in worksheet "Introduction" is the 31st of August.

National legislation that transposed the Fuel Quality Directive

Transposition into national law was put into effect by the Ministerial decree of 24 January 2002 (latest version) and needs to be viewed in relation to the ISO 17020 procedures of Fapetro.
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 ISO17020 procedures of Fapetro.

Reporting periods

Seasonal periods in Belgium are as follows:

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

Transition periods are defined as being the months of October and April. A vapour pressure waiver has been granted to Belgium.

Regarding the results provided for petrol, Fapetro wants to draw special attention to the Belgian annex of the NBN EN 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.

Vapour pressure is analyzed throughout the year in Belgium, as well as in summer as in winter.
The transition periods are used to give the fuel producers the ability to adapt the production of the fuel quality to meet the specifications of the summer or winter fuel quality.
However, every year Fapetro notices a boost of DVPE infringements in the month May. Those infringements are involuntary and due to low stock rotation in mainly small retail stations (at the end of the chain). At those stations, the 'winter' quality petrol staid longer in stock as the retail station did not sell that much. As a result of this the transfer period from 'winter' to 'summer' quality petrol was disturbed. All those infringements were small, harmless for the environment and involuntary.
Non-compliant samples for vapour pressure, regarding petrol, were due to low rotation of stocks in transition periods between winter and summer grades.

2.2.3 Sales

Table 2.3 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 (Essence95/Benzine95)	9.71	2 065 162 495	1 538 546	1 599	588	19 of 19
Unleaded petrol (minimum RON ≥ 98) E5 (Essence98/Benzine98)	2.38	526 840 413	392 496	1 636	544	19 of 19
Total petrol		2 592 002 908	1 931 042	3 235	1 132	
Diesel fuel B7 (Diesel10S)	6.00	7 685 661 073	6 402 156	1 444	2 220	7 of 7
Total diesel		7 685 661 073	6 402 156	1 444	2 220	

2.2.4 Exceedances of the fuel quality limits

Petrol fuel grades
Table 2.4 and Table 2.5 summarize the parameters for which exceedances were reported for petrol fuels.

Table 2.4 Unleaded petrol (minimum 95 ≤RON = 98) E10 (Essence95/Benzine95)

Parameter	Unit	Limit value	Minimum value measured	Maximum value measured	Number of samples outside tolerance limit	Total number of samples
Research octane number	-	> 95	91.2	98.7	1	298
Motor octane number	-	> 85	83.4	89.4	1	1 593
Vapour pressure, DVPE	kPa	< 60	50.5	89.1	75	1 599
Distillation evaporated at 100 ˚C	% v/v	> 46	40.4	68.3	1	1 598
Aromatics	% v/v	< 35	17.1	37.2	1	1 598
Oxygen content	% m/m	< 3.7	1.5	4.1	7	1 598
Ethanol	% v/v	< 10	0.8	11.0	7	1 598

Table 2.5 Unleaded petrol (minimum RON ≥ 98) E5 (Essence98/Benzine98)

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	51.0	95.8	131	1 636
Aromatics	% v/v	< 35	2.9	47.7	4	1 549
Oxygen content (petrol with 5 % (v/v) or less ethanol content)	% m/m	< 2.7	1.5	3.6	6	1 549

Diesel fuel grades

Table 2.6 summarizes the parameters for which exceedances were reported for the diesel fuel grades measured.

Table 2.6 Diesel fuel B7 (Diesel10S)

Parameter	Unit	Limit value	Minimum value measured	Maximum value measured	Number of samples outside tolerance limit	Total number of samples
Cetane number	--	> 51	47.3	56.5	30	3 664
Density at 15 ˚C	kg/m^3	< 845	820.2	846.5	31	3 664
Distillation 95 % point	˚C	< 360	330.5	392.9	4	3 664
Sulphur content	mg/kg	< 10	3.0	14.2	3	3 664
FAME content	% v/v	< 7	0.1	11.7	20	3 664

2.3 Bulgaria

2.3.1 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:	Refueling stations and terminals

2.3.2 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, refueling stations and road tankers for liquid fuels transport. In fulfillment 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 periods. 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 2019 was 8.2 %.
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.
Samples taken for the purposes of the republican control were tested in an accredited mobile laboratory and/or in the accredited permanently sited laboratory of DG QCLF.
The full scope of accreditation of DG QCLF laboratories is available on the link http://nab-bas.bg/BasDocSearch/DetailInfo?id=49523&page=703&part=704.

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).
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 was used statistical model "B", from 2015 – statistical model "A".
DG QCLF is a public body responsible to take actions where nonconformities 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 31 August.

National legislation that transposed the Fuel Quality Directive

The European legislation for the liquid fuels quality was introduced in the Bulgarian legislation by the Ambient Air Quality Act, Energy from Renewable Sources Act, as well as by the Regulation on the liquid fuels quality requirements, conditions, order, and way of their control. The Ambient Air Quality Act and the Regulation on the liquid fuels quality requirements, conditions, order, and way of their control introduced the requirements of EN 228 and EN 590. The Energy from Renewable Sources Act set minimum requirements for blending transport liquid fuels with biocomponent. According to Article 47 of the Energy from Renewable Sources Act, persons who place on the market liquid fuels are obliged on release for consumption to provide diesel fuel with minimum 6 % (V/V) biodiesel (amendment of 1 April 2019 – minimum 6 % (V/V) biodiesel and minimum one percent by volume of biodiesel to be a new generation biofuel) and petrol with minimum 8 % (V/V) content of bioethanol or ethers, produced from bioethanol (amendment of 1 March 2019 – 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: winter-summer transition period from 16 April to 31 May;
- for petrol: summer-winter transition period from 16 October to 30 November;
- for diesel: summer-winter transition period from 16 October to 30 November.

By implementing Decision of 7 April 2014, the European Commission approved the request of the Republic of Bulgaria for derogation from the maximum vapour pressure of petrol containing bioethanol for the summer period, according to Article 3 (4) and (5) of Directive 98/70/EC for liquid fuels quality. This Decision enables to be placed on the market petrol containing ethanol with maximum vapour pressure 60 kPa in the summer period with the respective vapour pressure waiver permitted, as referred to in Annex III to the Directive, on condition that the used ethanol is biofuel.
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 six samples of diesel fuel taken in a transition period from petroleum depots, because in Bulgarian legislation there are not transition periods for manufacturers and importers concerning seasonal specifications of fuels.

2.3.3 Sales

Table 2.7 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	624 886 117	468 665	56	58	19 of 19
Unleaded petrol (minimum RON ≥ 98) E10 (Unleaded petrol RON ≥ 98 E10)	10.0	55 872 285	41 904	5	8	19 of 19
Total petrol		680 758 402	510 569	61	66	
Diesel fuel B7 (Diesel fuel B7)	7.0	2 715 899 219	2 308 514	54	58	7 of 7

2.3.4 Exceedances of the fuel quality limits

Petrol fuel grades

Table 2.8 and Table 2.9 summarizes the parameters for which exceedances were reported for the petrol fuel grades measured.

Table 2.8 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
Oxygen content	% m/m	< 3.7	1.5	3.8	2	112

Table 2.9 Unleaded petrol (minimum RON ≥ 98) E10 (Unleaded petrol RON≥98 E10)

Parameter	Unit	Limit value	Minimum value measured	Maximum value measured	Number of samples outside tolerance limit	Total number of samples
Distillation evaporated at 100 ˚C	% v/v	> 44.7 ([11])	44.3	59	1	13

([11]) According to BDS EN ISO 3405:2019

Diesel fuel grades

Table 2.10 summarizes the parameters for which exceedances were reported for the diesel fuel grades measured.

Table 2.10 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
Distillation 95 % point	˚C	< 360	342	371.4	1	112
Sulphur content	mg/kg	< 10	5	57.3	1	112

2.4 Croatia

2.4.1 Country details

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

2.4.2 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 we have national sampling. Ministry of Environment and Energy receives annual reports from distributors to 31st March of current year for the previous year.
The control and sampling are performed by the legal entity that is certified according 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 refueling stations and terminals, according to the “Fuel quality monitoring program” which is under the responsibility of Ministry of Environment and Energy. Ministry of Environment and Energy 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 responsibility of Market Inspection (State Inspectorate, Republic of Croatia). Penalties are included in the Air Protection Law (OG No. 127/19). According to the national legislation which transposed the FQM Directive, the distributors are penalized in case of not submitting data to the National database established by Ministry of Environment and Energy. Enforcement is under responsibility of Environmental Inspection Republic of Croatia. Penalties are included in the Air Protection Law (OG No. 127/19).

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 Environmental and Energy.
Ministry of Environmental and Energy sets out “Fuel quality monitoring program” in 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 (analyze) the sulphur content by norm HRN EN ISO 8754 or 14596.; Reference method used for the precision of the testing method and the interpretation of test results: By norm HR EN ISO 4259; Number of National refineries: 2; Number of distribution terminals: 14; The Republic of Croatia submitted the annual Fuel Quality Monitoring data report on 30th of June for the years 2013, 2014 and 2015 considering the fact that Republic of Croatia has become a full Member State in July 2013.

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 and the Council Directive (EU) 2015/652) was transposed into Croatian legislation by the Regulation on the quality of liquid petroleum fuels and the manner of monitoring, reporting and the methodology used to calculate GHG emissions in the life of delivered fuels and energy (Official Gazette No 57/2017).

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.

2.4.3 Sales

Table 2.11 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	611 350 149	461 569	108	73	19 of 19
Unleaded petrol (minimum 95 ≤ RON < 98) (RON=98)	5.0	140 437	106			
Unleaded petrol (minimum RON ≥ 98) (RON=100)	5.0	43 116 123	32 553	4	8	19 of 19
Total Petrol		654 606 709	494 228	112	81	
Diesel fuel B7 (B7)	7.0	2 144 530 931	1 812 129	105	98	7 of 7
Total Diesel		2 144 530 931	1 812 129	105	98	

2.4.4 Exceedances of the fuel quality limits

Petrol fuel grades

Table 2.12 and Table 2.13 summarize the parameters for which exceedances were reported for the petrol fuel grades measured.

Table 2.12 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
Aromatics	% v/v	< 35	24.6	36.2	1	181

Table 2.13 Unleaded petrol (minimum RON ≥ 98) E5 (RON=100)

Parameter	Unit	Limit value	Minimum value measured	Maximum value measured	Number of samples outside tolerance limit	Total number of samples
Vapour pressure	% v/v	> 46	44.3	59	1	13

Diesel fuel grades

Table 2.14 summarizes the parameters for which exceedances were reported for the diesel fuel grades measured.

Table 2.14 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
FAME Content	% v/v	< 7	0.05	7.3	1	180

2.5 Cyprus

2.5.1 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:	Refueling stations

2.5.2 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, the depot at Larnaca, vehicles and other private installations of large consumers by the Inspectors of the MECI on a daily basis. The statistical and analytical results of the 2019 FQMS Report, includes samples from retail sites. The Mobile Lab of the MECI carried out almost all the tests required for monitoring the fuel quality for 2019, at the petrol stations. The Laboratory of the CPSC conducted a number of tests especially for verification purposes.

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 refueling 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 seven 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 law by Law 148(I)/2003 as amended by Decrees (KDP) P.I.252/15 plus P.I.200/16, P.I.102/15, P.I.326/13, P.I.328/13 and P.I.6/2014.

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 6 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.

2.5.3 Sales

Table 2.15 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) (Unleaded Gasoline-Petrol RON 95)	0.0 %	417 843 061	307 238	185	111	19 of 19
Unleaded petrol (minimum RON ≥ 98) (Unleaded Gasoline-Petrol RON 98)	0.0 %	33 397 391	24 557	180	98	19 of 19
Unleaded petrol (minimum RON ≥ 98) E5 (Unleaded Gasoline-Petrol RON 100)	0.0 %	1 230 300	904	8	1	13 of 19
Total Petrol		452 470 752	332 698	373	210	
Diesel fuel B7 (Eurodiesel)	7.0 %	398 755 510	332 296	213	125	7 of 7
Total Diesel		398 755 510	332 296	213	125	

2.5.4 Exceedances of the fuel quality limits

Petrol fuel grades

Table 2.16 summarize the parameters for which exceedances were reported for the petrol fuel grades measured.

Table 2.16 Unleaded petrol (minimum RON ≥ 98) (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	74.6	26	175

Diesel fuel grades

Table 2.17 summarizes the parameters for which exceedances were reported for the diesel fuel grades measured.

Table 2.17 Diesel fuel B7 (Eurodiesel)

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	7.6	3	338

2.6 Czechia

2.6.1 Country details

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

2.6.2 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 Czechia. Since the Czechia´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 Czechia (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 Czechia, 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 2019. 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

Fuel sampling was performed in accordance with the requirements of national and European legislation and general FQMS standards. The FQMS is used as a controlling system in accordance with the Czech Standard ČSN EN 14274:2013 and Czech versions of European Standards EN 228:2012 and EN 590:2013 for petrol and diesel, namely ČSN EN 228:2013 and ČSN EN 590:2014. If the CTIA controller finds non-compliance in the fuel quality at a service station, the sale of fuels is banned until the quality has been rectified; there is also the possibility of financial sanctions, in accordance with Act No 311/2006 Coll. for fuels and petrol stations.
The national legislation is transposed by the rules and obligations of the FQD. The CTIA is a government institution that comes under the jurisdiction of the MIT.
The annual data collected during the previous year's fuel quality monitoring are provided by the CTIA in the form of an annual report to the coordinating office, the MIT's Department of Gas Industry and Liquid Fuels. This department is responsible for the relevant working agenda and for reporting to the European Commission. The FQMS has been carried out under the management of the Department of Gas Industry and Liquid Fuels since 2001. Since the Czechia's accession to the EU in May 2004, the national FQMS has been adapted to the conditions of the EU system and is compatible with it. In addition, it has been developed in accordance with the current requirements of the 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 the Czechia. Data of annual fuel analyses were taken from the service stations, which were sold the liquid and gas fuels at the Czech trade in the previous year. The figures on annual fuel analysis were provided by the MIT's Department of Data Support and Analyses Unit, in cooperation with the Czech Statistical Office (A new deadline has been set for submitting the final report for the Member States of EU by Directive (EU) 2015/1513, but Czechia doesn´t face any problem 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 European legislation. The fuel quality has been monitored by Decree No. 133/2010 Coll on requirements for fuels, monitoring of the composition and fuels quality and their records later amended, 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 and the national legislation for energy.
The Ministry of Industry and Trade of the Czechia 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 GHG as subsequently amended and coordination of all work at the national level monitored in the year 2019, which is shown in details in the tabular requirements of this template for reporting to the European Commission.

Reporting periods

Seasonal periods in Czechia are as follows:

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

The results of sampling in the transition periods have been included for two seasons, spring and autumn. In 2019, 2 668 samples were checked including alternative fuels at the service stations in the whole country. In total 2 318 samples of the basic fuel quality. Specifically, 434 samples of petrol and 595 samples of diesel were checked in summertime and 576 samples of petrol and 707 samples of diesel plus 6 samples of artic diesel in wintertime or 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.

2.6.3 Sales

Table 2.18 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)	6.62	2 092 523 000	1 570 700	395	548	19 of 19
Unleaded petrol (minimum RON ≥ 98) E5 (BA-98)	4.86	57 738 000	43 400	39	28	19 of 19
Unleaded petrol (minimum RON ≥ 98) E+ (E85)	76.12	2 435 000	1 900	0	0	0 of 19
Total Petrol		2 152 696 000	1 616 000	434	576	19 of 19
Diesel fuel B7 (motorova nafta)	5.74	6 004 660 000	5 025 000	595	707	7 of 7
Total Diesel		6 004 660 000	5 025 000	595	707	7 of 7

2.6.4 Exceedances of the fuel quality limits

Petrol fuel grades

Table 2.19 and Table 2.20 summarizes the parameters for which exceedances were reported for the petrol fuel grades measured.

Table 2.19 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	71.3	8	395

Table 2.20 Unleaded petrol (minimum RON ≥ 98) E5 (BA-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	67.1	4	39

Diesel fuel grades

Table 2.21 summarizes the parameters for which exceedances were reported for the diesel fuel grades measured.

Table 2.21 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
Sulphur content	mg/kg	< 10	3.1	39.3	1	1 302
FAME Content	% v/v	< 7	0.3	8.2	1	1 302

2.7 Denmark

2.7.1 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:	Refueling stations

2.7.2 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: 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 taking action 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 2 refineries in Denmark. Some samples are not analyzed 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 because of the arctic weather conditions. Samples taken during the transitional periods (spring and autumn) cover the winter period. Samples are not taken during the transition period.

2.7.3 Sales

Table 2.22 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 (Oktan 92 unleaded)	5.0	82 258 000	61 693	4	5	19 of 19
Unleaded petrol (minimum RON = 95) E5 (Oktan 95 unleaded)	5.0	1 651 881 000	1 238 910	51	50	19 of 19
Unleaded petrol (minimum RON ≥ 98) E5 (Oktan 100 unleaded)	5.0	59 337 000	44 502	1	1	19 of 19
Total Petrol		1 793 476 000	1 345 107	56	56	
Diesel fuel B7 (Miljødiesel (< 0,01 % S))	7.0	3 275 792 000	2 751 665	50	50	6 of 7
Total Diesel		3 275 792 000	2 751 665	50	50	

2.7.4 Exceedances of the fuel quality limits

Petrol fuel grades

Table 2.23 and Table 2.24 summarize the parameters for which exceedances were reported for the petrol fuel grades measured.

Table 2.23 Regular unleaded petrol (minimum RON = 91) E5 (Oktan 92 unleaded)

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	72.3	1	4
Aromatics	% V/V	< 35	32.6	37	2	9

Table 2.24 Unleaded petrol (minimum RON = 95) E5 (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	28.3	37	7	101

Diesel fuel grades

No exceedances of the diesel fuel quality limits were reported.

2.8 Estonia

2.8.1 Country details

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

2.8.2 Fuel quality monitoring service

Sampling

Samples are taken by the Estonian Environmental Research Centre, which is also responsible for analysis and reporting of results. Samples are taken only from retail fuel stations and procedures are undertaken in accordance with Standard EN 14275. Sampling points are selected so that most of the refueling stations are covered within a 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 19 of June. When non-compliant samples occur, the public bodies responsible for taking action are the Estonian Environmental Inspectorate and the Estonian Tax and Customs Board. These two bodies are informed immediately by e-mail and by post. If necessary, new samples are taken by Tax and Customs Board. Estonia is a small sized country, using statistical model C. The whole country is defined as one macro-region. The system has been designed in 2004-2005 using EN 14274 model C.

National legislation that transposed the Fuel Quality Directive

Elements of the FQD requirements are described in 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.

Estonia has been granted a Vapour Pressure Waiver because of arctic weather conditions. Transition periods are from 1 October to 30 November and from 1 March to 30 April. Samples are taken also during the transition periods.

2.8.3 Sales

Table 2.25 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 (RON95)	7.23	196 398 878	145 335	99	50	19 of 19
Unleaded petrol (minimum RON ≥ 98) E5 (RON98)	1.08	106 592 295	78 878	71	25	19 of 19
Total Petrol		302 991 173	224 214	170	75	
Diesel fuel B7 (Diesel B7)	2.82	941 998 757	786 192	120	53	7 of 7
Total Diesel		941 998 757	786 192	120	53	

2.8.4 Exceedances of the fuel quality limits

Petrol fuel grades

Table 2.26 summarizes the parameters for which exceedances were reported for the petrol fuel grades measured.

Table 2.26 Unleaded petrol (minimum 95 ≤ RON < 98) 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, DVPE	kPa	< 60	54.3	88.7	2	149

Diesel fuel grades

No exceedances of the diesel fuel quality limits were reported.

2.9 Finland

2.9.1 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:	Refueling stations

2.9.2 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 analyzed 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 3 macro-regions with about the same sales volumes and variability factors. There are 2 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 2019, subcontractors were used for octane and cetane numbers and most analysis of PAH content and some analyses of distillation. Except for the lead, manganese and FAME methods, all methods of analysis used (including those subcontracted) were reference methods according to the standards EN 228:2012 and EN 590:2013. FAME method is based on ATR technique. 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 much 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. Sulfur of petrol and diesel (EN ISO 20846:2011 method), density of diesel (EN ISO 12185:1996 method) and vapour pressure of petrol (EN 13016-1:2018 method) methods have been accredited by FINAS Accreditation service. Other methods used by the laboratory have been tested and validated according to the quality procedure of Customs Laboratory. These test methods are EN ISO 3405 method (distillation of petrol and diesel), EN 12916 method (polycyclic aromatic hydrocarbons content of diesel), EN ISO 22854:2014 method (aromatics, olefins, benzene, oxygenates and oxygen contents of petrol). Manganese content of petrol

was also examined by energy dispersive X-ray fluorescence spectroscopy. The laboratory can confirm the manganese content according to the EN 16136 method, if necessary. The authenticity and accuracy of the methods used by the laboratory have been verified by the national Round Robin and international PT comparative studies. The determination of RON (EN ISO 5164 method) and MON (EN ISO 5163 method) numbers of petrol and cetane number of diesel (EN ISO 5165 method).
In 2019, 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 oxygen) were acceptable. In 2001–2018, 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, analyze the samples. However, subcontractors whose competence has been confirmed can be used.
In case of non-compliant samples, the analyses are 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 are 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” has been granted in 2011. The summer period is from 1st of June to 31st of August during which the maximum vapour pressure is 70 kPa. For details see Commission decisions K(2011) 714 final and K(2011) 3772 final and the Finnish notification letter on Fuel Quality Vapour Pressure Derogation. Original notification dated on 17th of February 2010, supplementary information on 26th of June 2010 and 6th of September 2010.

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.

2.9.3 Sales

Table 2.27 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	1 332 448 000	999 336	50	55	19 of 19
Unleaded petrol (minimum RON ≥ 98) (Moottoribensiini 98 E5)	Max. 5.0	531 972 000	398 979	49	55	19 of 19
Total petrol		1 864 420 000	1 398 315	99	110	
Diesel fuel B7 (Dieselöljy)	Max. 7.0	3 087 232 000	2 608 711	50	54	6 of 7
Total diesel		3 087 232 000	2 608 711	50	54	

2.9.4 Exceedances of the fuel quality limits

Petrol fuel grades

Table 2.28 summarize the parameters for which exceedances were reported for the petrol fuel grades measured.

Table 2.28 Unleaded petrol (minimum RON ≥ 98) E5 (Moottoribensiini 98 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	<70	0	72.2	1	49

Diesel fuel grades

No exceedances of the diesel fuel quality limits were reported.

2.10 France

2.10.1 Country details

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

2.10.2Fuel quality monitoring service

Sampling

The service provider responsible for sampling and analysis, on behalf of the General Directorate of Energy and Climate (DGEC), is the company SGS FRANCE. The company SGS FRANCE is audited once a year by DGEC. The DGEC is responsible for the reporting based on the elements transmitted by the provider. The inspections are done throughout the national territory and concern petrol and diesel fuels. Control points are the service stations. The service stations are selected at random. Each refueling station control campaign is spread over a calendar year and is organized in quarterly programs, except for the French overseas territories'(DOM) where the sampling is done once a year because of the absence of seasonality. Samples are taken throughout the year.

Fuel quality monitoring system administration

The organization responsible for sampling, analyzing and reporting is SGS FRANCE (on behalf of the DGEC). France is a large sized country, using statistical model A. Eight macro-regions are defined, including the French overseas territories.

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.

2.10.3 Sales

Table 2.29 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)	5.0	5 899 146 000	4 453 856	123	101	19 of 19
Unleaded petrol (minimum RON = 95) E10 (SP95-E10)	10.0	5 409 544 000	4 084 206	101	98	19 of 19
Unleaded petrol (minimum RON = 95) E+ (E85)	85.0	337 178 000	254 569	6	6	6 of 19
Total Petrol		11 645 868 000	8 792 631	230	205	
Diesel fuel B7 (B7)	8.0	39 136 200 000	33 070 089	124	102	7 of 7
Diesel fuel B+ (> 7 % FAME <=30 %) (B10)	10.0	20 527 000	17 345	0	0	0 of 7
Total Diesel		39 156 727 000	33 087 434	124	102	

2.10.4 Exceedances of the fuel quality limits

Petrol fuel grades

Table 2.30, Table 2.31 and Table 2.32 summarize the parameters for which exceedances were reported for the petrol fuel grades measured.

Table 2.30 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
RON	--	> 95	93.8	99.7	1	224
Vapour Pressure, DVPE	kPa	< 60	53	71	10	123
Ethanol	% v/v	< 5	0	5.6	1	204

Table 2.31 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	49.3	72.9	6	101
Oxygen content	% (m/m)	< 3.7	2.43	4.17	1	199

Table 2.32 Unleaded petrol (minimum RON = 95) E10+ (E85)

Parameter	Unit	Limit value	Minimum value measured	Maximum value measured	Number of samples outside tolerance limit	Total number of samples
Ethanol	% v/v	< 75	66.09	78.58	3	12

Diesel fuel grades

Table 2.33 summarizes the parameters for which exceedances were reported for the diesel fuel grades measured.

Table 2.33 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	4.6	9.2	2	206

2.11 Germany

2.11.1 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:	Refueling stations

2.11.2 Fuel quality monitoring service

Sampling

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

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

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)

Bayern:

- Bayer. Staatsministerium für Umwelt und Verbraucherschutz (d)
- Bayer. Landesamt für Umwelt (c)
- private laboratory (a,b)

Berlin:

- Senatsverwaltung für Umwelt, Verkehr und Klimaschutz (d,c)
- private laboratory (a,b)

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)

Bremen:

- Die Senatorin für Klimaschutz, Umwelt, Mobilität, Stadtentwicklung und Wohnungsbau (d,a)
- Gewerbeaufsicht des Landes Bremen (a,c)
- private laboratory (a,b)

Hamburg:

- Behörde für Umwelt und Energie, Amt für Immissionsschutz und Abfallwirtschaft, Referat für Raffinerien, Tankläger und Reinigungsbetriebe (d, c)
- private laboratory (a,b)

Hessen:

- Hessische Ministerium für Umwelt, Klimaschutz, Landwirtschaft und Verbraucherschutz, Mainzer Straße 80, 65189 Wiesbaden (d)
- Regierungspräsidium Darmstadt (c)
- private laboratory (a,b)

Mecklenburg-Vorpommern:

- Ministerium für Landwirtschaft und Umwelt M-V (d)
- Landesamt für Umwelt, Naturschutz und Geologie M-V (a,c)
- Staatiche Ämter für Landwirtschaft und Umwelt (a,c)
- private laboratory (a,b)

Niedersachsen:

- Niedersächsisches Ministerium für Umwelt, Energie, Bauen und Klimaschutz (d, a)
- Landkreise und kreisfreie- und große selbstständige Städte (a,c)
- private laboratory (a,b)

Nordrhein-Westfalen:

- Ministerium für Umwelt, Landwirtschaft, Natur- und Verbraucherschutz NRW (d)
- untere Immissionsschutzbehörden: Kreise und Kommunen (c)
- private laboratory (a,b)

Rheinland-Pfalz:

- Ministerium für Umwelt, Energie, Ernährung und Forsten (d)
- Struktur- und Genehmigungsdirektion Nord sowie Struktur- und Genehmigungsdirektion Süd (a,c)
- private laboratory (b)

Saarland:

- Ministerium für Umwelt und Verbaucherschutz (d)
- Landesamt für Umwelt und Arbeitsschutz (c)
- private laboratory (a,b)

Sachsen:

- Sächsisches Staatsministerium für Energie, Klimaschutz, Umwelt und Landwirtschaft (d)
- Landesdirektion Sachsen (a,c)
- private laboratory (b)

Sachsen-Anhalt:

- Ministerium für Umwelt, Landwirtschaft und Energie (Magdeburg) (d)
- Landesverwaltungsamt Sachsen-Anhalt (d)
- Landkreise (a,b,c)
- private laboratory (a,b)

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)

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 refueling 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 (D) 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 the link http://www.verwaltungsvorschriften-im-internet.de/pdf/BMU-IGI6-20120904-SF-A020.pdf.
The federal states must convey their results to the German Environment Agency until the 30th of April of the following year, where a general report is produced. The German Environment Agency passes this report on to the Federal Ministry for the Environment, Nature Conservation and Nuclear Safety and to the European Commission.
The governments of the German federal states and/or the lower ranking government agencies are responsible for acting in the case of non-compliant samples. The design of the system was defined in DIN EN 14274-2003. It was adopted into legislation by the 10th BImSchV in 2008.
The number of refineries in Germany was 13. The number of refueling stations in Germany was 14 459 by the end of 2019.

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 labeling of the qualities of fuels and fuels - 10th BImSchV)" i.e., Tenth Ordinance Implementing the Federal Emission Control Act (10th BImSchV) on the link http://www.gesetze-im-internet.de/bimschv_10_2010/index.html"

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 28 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 (new in 2019 report) 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 transition period data is assigned to the summer or winter period which would induce flexibility on the number of limit breaches and thus is excluded from the EU-reporting.

2.11.3 Sales

Table 2.34 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	19 557 996 438	14 668 534	193	184	19 of 19
Unleaded petrol (minimum RON = 95) E10 (Super E10)	10.0	3 285 842 452	2 464 388	172	163	19 of 19
Unleaded petrol (minimum RON >= 98) E5 (Super Plus)	5.0	1 110 653 223	832 992	28	25	19 of 19
Total Petrol		23 954 492 114	17 965 914	393	372	
Diesel fuel B7 (Diesel)	7.0	45 057 113 322	37 848 172	227	239	6 of 7
Total Diesel		45 057 113 322	37 848 172	227	239	

2.11.4 Exceedances of the fuel quality limits

Petrol fuel grades

Table 2.35 and Table 2.36 summarize the parameters for which exceedances were reported for the petrol fuel grades measured.

Table 2.35 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
Olefins	% v/v	< 20.7	0.6	33	1	312
Ethanol	% v/v	< 5.3	2.2	5.4	1	377

Table 2.36 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	53.3	64.7	2	172
Aromatics	% v/v	< 20.7	14.2	37.4	1	335

Diesel fuel grades

Table 2.37 summarizes the parameters for which exceedances were reported for the diesel fuel grades measured.

Table 2.37 Diesel fuel B7 (Diesel)

Parameter	Unit	Limit value	Minimum value measured	Maximum value measured	Number of samples outside tolerance limit	Total number of samples
Sulphur content	% v/v	< 12.3	1.0	12.0	1	466
FAME Content	% v/v	< 7.3	0	8.8	1	466

2.12 Greece

2.12.1 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:	Refueling stations

2.12.2 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 Regions B and C, the competent bodies for taking fuel samples are the inspection teams from the Chemical Services of the General Chemical State Laboratory, working in collaboration with the regional customs authorities. Refueling 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.
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 refueling 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 taking

action. 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). In Greece there are 4 refineries and approximately 7 000 refueling stations.

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.

2.12.3 Sales

Table 2.38 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 RON)	5.0	2 719 459 157	2 032 796	50	50	10 of 19
Unleaded petrol (minimum 95 ≤ RON < 98) E5 (LRP (96 RON))	5.0	375 532	281	3	3	10 of 19
Unleaded petrol (minimum RON ≥ 98) E5 (super unleaded (100 RON))	5.0	329 155 813	246 044	4	4	10 of 19
Total Petrol		3 048 990 502	2 279 120	57	57	
Diesel fuel B7 (Diesel fuel)	7.0	3 279 381	2 730 084	50	50	4 of 7
Total Diesel		3 279 381	2 730 084	50	50	

2.12.4 Exceedances of the fuel quality limits

Petrol fuel grades

No exceedances of the petrol fuel quality limits were reported.
Table 2.39 summarizes the parameters for which exceedances were reported for the petrol fuel grades measured.

Table 2.39 Unleaded petrol (minimum RON = 95) E5 (95 RON)

Parameter	Unit	Limit value	Minimum value measured	Maximum value measured	Number of samples outside tolerance limit	Total number of samples
RON	--	> 95	90	97.1	1	100
Distillation evaporated at 100 ˚C	% V/V	> 46	38.5	66	1	100
Oxygen content	% m/m	< 2.7	0.4	3.8	1	74
Sulphur content	mg/kg	< 10	1.9	13.9	1	100

Diesel fuel grades

Table 2.40 summarizes the parameters for which exceedances were reported for the diesel fuel grades measured.

Table 2.40 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/m3	< 845	820	860.5	1	100
Distillation 95 % Point	˚C	< 360	338	400	1	100
Sulphur content	mg/kg	< 10	4	1 270	5	100
FAME Content	% v/v	< 7	0	8.5	7	98

2.13 Hungary

2.13.1 Country details

Responsible organization:	ÁMEI Zrt.
Country size:	Small
Summer period:	1 May to 30 September
FQMS used:	EN 14274 statistical model C
Location of sampling:	Refueling stations

2.13.2 Fuel quality monitoring service

Sampling

Entity responsible for the sampling, testing and reporting is ÁMEI Zrt. contracted by the Ministry of Innovation and Technology. 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 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 was contracted to AMEI Zrt. Annual data set is provided by 31st of March of the consecutive year. Test results including non-compliant samples are quarterly reported to the relevant Ministry.
Model C (small country) was considered 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 were sampled.

National legislation that transposed the Fuel Quality Directive

Based on the Directive, 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.

2.13.3 Sales

Table 2.41 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 (ESZ-95)	5.0	1 849 380 000	1 386 480	50	50	19 of 19
Unleaded petrol (minimum RON ≥ 98) E5 (ESZ-98)	5.0	135 000 000	101 614	10	10	19 of 19
Total Petrol		1 984 380 000	1 488 094	60	60	
Diesel fuel B7 (Dízel gázolaj)	7.0	4 509 610 000	3 780 857	60	60	6 of 7
Total Diesel		4 509 610 000	3 780 857	60	60	

2.13.4 Exceedances of the fuel quality limits

Petrol fuel grades

Table 2.42 and Table 2.43 summarize the parameters for which exceedances were reported for the petrol fuel grades measured.

Table 2.42 Unleaded petrol (minimum RON = 95) E5 (ESZ-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	54.5	91.7	2	100

Table 2.43 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	32.1	36.1	1	20

Diesel fuel grades

Table 2.44 summarizes the parameter for which exceedances were reported for the diesel fuel grades measured.

Table 2.44 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	mg/kg	< 10	3.3	35.4	1	100

2.14 Ireland

2.14.1 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:	Refueling stations

2.14.2 Fuel quality monitoring service

Sampling

Samples of petrol and diesel are taken by the Irish Petroleum Industry Association and are analyzed by ITS Testing Services (UK) Ltd. Reporting is the responsibility of the Department of Communications, Climate Action and Environment. Samples are taken from refueling 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 and 100 ˚C ISO3405, olefins and aromatics ASTM D1319, benzene EN238, other oxygenates, methanol, ethanol, iso-propanol, iso-butanol, tert-butanol, ethers (5 or more C atoms) and other oxygenates EN13132, sulphur content IP 490, lead EN237.
For diesel samples the following methods were used cetane number EN ISO 5165. Density at 15 ˚C EN ISO 12185, distillation 95 % ISO3405, polycyclic aromatics EN 12916, sulphur content IP 490 F.A.M.E. BS EN 14078.

Fuel quality monitoring system administration

The Department of Communications, Climate Action and Environment has responsibility for managing and implementing the FQD. Samples of petrol and diesel are taken by the Irish Petroleum Industry Association and are analyzed by ITS Testing Services (UK) Ltd. Reporting is the responsibility of the Department of Community, Climate Action & Environment. Samples are taken from refueling stations. Selection of sampling points is on a random basis and is carried out throughout the year. Annual data is provided by the Irish Petroleum Industry 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 Communications, Climate Action and Environment 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. There are no reasons why the annual fuel quality monitoring data report cannot be provided by the annual deadline.

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.

A Vapour Pressure Waiver has been granted because of arctic weather conditions.

2.14.3 Sales

Table 2.45 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	1 373 870 771	1 017 682	50	50	18 of 19
Total petrol		1 373 870 771	1 017 682	50	50	
Diesel fuel B7	4.0	3 723 081 659	3 147 153	50	50	6 of 7
Total diesel		3 723 081 659	3 147 153	50	50	

2.14.4 Exceedances of the fuel quality limits

Petrol fuel grades

No exceedances of the petrol fuel quality limits were reported.

Diesel fuel grades

Table 2.46 summarizes the parameters for which exceedances were reported for the petrol fuel grades measured.

Table 2.46 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	< 10	0.04	8	3	100

2.15 Italy

2.15.1 Country details

Responsible organization:	Ministry of Environment Land and Sea
Country size:	Large
Summer period:	1 May to 30 September
FQMS used:	EN 14274 statistical model A
Location of sampling:	Refueling stations

2.15.2 Fuel quality monitoring service

Sampling

The monitoring system was set up using Statistical Model A of EN 14274 (large country framework, five macro-regions). A total of 275 petrol samples and 337 diesel fuel samples were analyzed. The distribution of samples throughout Italy was 19 % north-west, 14 % north-east, 23 % center, 14 % south and 30 % islands. The testing required for fuel quality monitoring was performed by laboratories that regularly participate in one or more national inter-laboratory proficiency testing schemes and that are accredited in accordance with EN ISO 17025 or certified in accordance with 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 2019 the sampling was carried out at refueling stations only. Sample 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 3 February 2005. The competent authority for the system of monitoring fuel quality is the Ministry of the Environment and Protection of Land and Sea.
The fuel quality monitoring (sampling and measurements) was carried out 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. On the basis of this report, the Ministry of the Environment and Protection of Land and Sea produces data for the European Commission.

National legislation that transposed the Fuel Quality Directive

The Fuel Quality Directive was transposed by the Legislative Decree of 21 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 16 November to 15 March; diesel from 15 November to 15 March.

No samples were taken during the transition period.

2.15.3 Sales

Table 2.47 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 (E5)	0.83	8 255 500 560	6 070 221	148	127	17 of 19
Total Petrol		8 255 500 560	6 070 221	148	127	
Diesel fuel B7 (B7)	5.11	30 819 514 880	25 898 752	191	146	6 of 7
Total Diesel		30 819 514 880	25 898 752	191	146	

2.15.4 Exceedances of the fuel quality limits

Petrol fuel grades

Table 2.48 summarizes the parameters for which exceedances were reported for the petrol fuel grades measured.

Table 2.48 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
RON	--	> 95	94.3	98.5	1	275

Diesel fuel grades

Table 2.49 summarizes the parameters for which exceedances were reported for the diesel fuel grades measured.

Table 2.49 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	0	7.4	1	243

2.16 Latvia

2.16.1 Country details

Responsible organization:	The State Construction Control Bureau of Latvia (SCCB)
Country size:	Small
Summer period:	1 June to 31 August
FQMS used:	National system
Location of sampling:	Refueling stations and terminals

2.16.2 Fuel quality monitoring service

Sampling

In 2019, organization responsible for fuel sampling and analysis was the State Revenue Service. In total 48 diesel samples have been taken from refueling stations and terminals and 35 petrol samples from refueling stations. The samples have been collected throughout the year. As of the year 2020, the fuel quality reporting is performed by the State Construction Control Bureau of Latvia (SCCB). Previously it was the responsibility of the Ministry of Economics of the Republic of Latvia.

Fuel quality monitoring system administration

The Ministry of Economics of the Republic of Latvia is responsible for managing and implementing the FQD. The State Revenue Service is responsible for inspection of fuel quality and supervision of fuel market. As of 1st of January 2020, supervision and control over fuel market and fuel quality monitoring in Latvia will be performed by the State Construction Bureau of Latvia (SCCB), however this reporting is based on the fuel quality data obtained by the State Revenue Service in 2019. The said functions are taken over from the Ministry of Economics and the State Revenue Service to implement more efficient control of the national aid system and separate policymaking from monitoring and control functions. Latvia is small sized country, using a national system to monitor fuel quality.

National legislation that transposed the Fuel Quality Directive

The legislation regarding fuel quality has been transposed into the national law by the Cabinet Regulation No. 332 '' Requirements for Conformity Assessment of Petrol and Diesel Fuel '' which determines 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. Regulation No 332 also determines the institutions for supervision of the market and procedures for conformity assessment of petrol and diesel fuel. Cabinet Regulation No 772 ''Regulations Regarding Requirements for Biofuel Quality, Conformity Assessment, Market Supervision and Procedures for Consumer Information'' prescribes 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.

Reporting periods

Seasonal periods in Latvia are as follows:

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

appropriate to Arctic weather conditions. Fuel samples have been taken throughout the year and no transition period between summer and winter grade fuels has been defined.
According to the Directive 98/70/EC Article 2 (5) Latvia belongs to the Member States with low ambient summer temperatures.

2.16.3 Sales

Table 2.50 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 (A-95)	5.0	204 687 582	156 586	4	18	10 of 19
Unleaded petrol (minimum RON = 95) E+ (E85)	85.0	74 510	57			
Unleaded petrol (minimum RON ≥ 98) E10 (A-98)	0	699	18 499	2	11	10 of 19
Total Petrol		204 762 791	175 142	6	29	
Diesel fuel (DD)	0	676 898 204	565 210	2	33	6 of 7
Diesel fuel B7 (DD B5)	5.0	545 807 185	455 749	8	5	6 of 7
Total Diesel		1 222 705 389	1 020 959	10	38	

2.16.4 Exceedances of the fuel quality limits

Petrol fuel grades

No exceedances of the petrol fuel quality limits were reported.
Table 2.51 summarizes the parameters for which exceedances were reported for the petrol fuel grades measured.

Table 2.51 Unleaded petrol (minimum RON = 95) E5 (A-95)

Parameter	Unit	Limit value	Minimum value measured	Maximum value measured	Number of samples outside tolerance limit	Total number of samples
RON	--	> 95	93.4	97	5	22

Diesel fuel grades

Table 2.52 summarizes the parameters for which exceedances were reported for the petrol fuel grades measured.

Table 2.52 Diesel fuel B7 (DD)

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	8	43.1	1	35

2.17 Lithuania

2.17.1 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:	Refueling stations

2.17.2 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. The organization responsible for reporting is the Ministry of Energy. In total, 104 samples of petrol A-95 and A-98 were taken at service stations.

Fuel quality monitoring system administration

The Ministry of Energy has responsibility for managing and implementing FQD. Fuel sampling was carried out 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. 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.

2.17.3 Sales

Table 2.53 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 (A-95(RON 95))	10.0	332 501 305	250 041	50	50	19 of 19
Unleaded petrol (minimum RON >= 98) E10 (A-95(RON 98))	10.0	8 709 749	5 873	0	4	19 of 19
Total Petrol		341 211 054	255 914	50	54	
Diesel fuel B+ (>7 % FAME ≤ 30 %) (Diesel)	7.0	2 145 894 783	1 813 281	50	50	7 of 7
Total Diesel		2 145 894 783	1 813 281	50	50	

2.17.4 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.

2.18 Luxembourg

2.18.1 Country details

Responsible organization:	Environmental Administration of Luxembourg (Administration de l'environnement)
Country size:	Small
Summer period:	1 May to 15 September
FQMS used:	National system
Location of sampling:	Refueling stations and terminals

2.18.2 Fuel quality monitoring service

Sampling

For 2019, the sampling, analysis and reporting of fuel quality was managed by three organizations. The samples were taken at depots and public refueling 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 FQMS is under the responsibility of the Environmental Administration of Luxembourg, part of the Department of Environment of the Ministry of Sustainable Development and Infrastructures. Fuel sampling, analysis and reporting is each carried out by a contracted organization. Within one week the results of the analyzed parameters are 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. During the transition period, no samples are taken or tested.

2.18.3 Sales

Table 2.54 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	369 738 053	273 606	32	31	19 of 19
Unleaded petrol (minimum RON >= 98) E5 (Euro 98)	5.0	110 604 655	81 847	32	31	19 of 19
Total Petrol		480 342 708	355 454	64	62	
Diesel fuel B7 (Diesel)	7.0	1 912 070 660	1 606 139	31	31	7 of 7
Total Diesel		1 912 070 660	1 606 139	31	31	

2.18.4 Exceedances of the fuel quality limits

Petrol fuel grades

Table 2.55 summarizes the parameters for which exceedances were reported for the petrol fuel grades measured.

Table 2.55 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, DVPE	kPa	< 60	55.9	70.4	2	63

Diesel fuel grades

No exceedances of the diesel fuel quality limits were reported.

2.19 Malta

2.19.1 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:	Refueling stations

2.19.2 Fuel quality monitoring service

Sampling

The organization responsible for sampling and reporting is the Regulator for Energy and Water Services. The organization responsible for the analysis is an independently contracted laboratory.

Fuel quality monitoring system administration

A total of 214 fuel samples, comprising of 103 diesel, 105 unleaded petrol minimum RON 95 and 6 unleaded petrol minimum RON 98, were analyzed. Unleaded petrol samples were analyzed according to the SM EN 228 quality standard and the diesel samples according to the SM EN 590 quality standard. All the samples were taken from refueling stations.
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 214 samples were collected by REWS compliance officers from fuel dispensing sites and then analyzed 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 Fuel Quality Directive, 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.

2.19.3 Sales

Table 2.56 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) (EN 228 minimum RON 95)	0.0	109 071 947	80 794	52	53	19 of 19
Unleaded petrol (minimum RON >= 98) E5 (EN 228 minimum RON 98)	0.0	3 073 154	2 276	3	0	19 of 19
Total Petrol		112 145 100	83 070	55	53	
Diesel fuel B7 (Diesel EN 590)	≤ 7	195 003 891	164 560	52	51	6 of 7
Total Diesel		195 003 891	164 560	52	51	

2.19.4 Exceedances of the fuel quality limits

Petrol fuel grades

No exceedances of the petrol fuel quality limits were reported.

Diesel fuel grades

Table 2.57 summarizes the parameters for which exceedances were reported for the diesel fuel grades measured.

Table 2.57 Diesel fuel B7 (Diesel EN 590)

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	5.3	20.6	1	103

2.20 Netherlands

2.20.1 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:	Refueling stations

2.20.2 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 has responsibility for managing and implementing the FQD. The analysis of all parameters is performed by the Dutch Customs Laboratory except for the analysis of the Research Octane Number (RON) and Motor Octane Number (MON). The analysis of the RON and MON 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 for the processes in place to report, manage and monitor such non-compliance. This action is consisted of alerting the offender to the detected offense and warning to prevent its repetition.

National legislation that transposed the Fuel Quality Directive

The Dutch legislation transposed the Fuel Quality Directive under the Air Pollution Fuels Decree. Air Pollution Fuels Decree of 8 April 2011, laying down requirements with regard to fuels for the implementation of Directive 2009/30/EC of the European Parliament and of the Council of 23 April 2009 amending Directive 98/70/EC with regard to the specification petrol, diesel fuel and gas oil and establishing a mechanism to monitor and reduce GHG emissions, amending Council Directive 1999/32/EC as regards the specification of inland waterway fuels and repealing Directive 93/12/EEC (PbEU L 140). With this, the fuel legislation has been transposed into the Dutch national law.

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 1 December.

No samples were collected during the transition period.

2.20.3 Sales

Table 2.58 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 (Euro 95/E10)	10.0	5 682 000 000	4 328 000	58	40	12 of 19
Unleaded petrol (minimum RON >= 98) E5 (Super ongelood 98/E5)	5.0	89 000 000	66 000	1	1	12 of 19
Total Petrol		5 771 000 000	4 394 000	59	41	
Diesel fuel B7 (Diesel)	7.0	7 786 000 000	6 509 000	61	41	6 of 7
Total Diesel		7 786 000 000	6 509 000	61	41	

2.20.4 Exceedances of the fuel quality limits

Petrol fuel grades

Table 2.59 and Table 2.60 summarize the parameters for which exceedances were reported for the petrol fuel grades measured.

Table 2.59 Unleaded petrol (minimum 95 =< RON < 98) E10 (Euro 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	0	63.1	1	50
Benzene	% v/v	< 1	0.43	1.22	2	98

Table 2.60 Unleaded petrol (minimum RON >= 98) E5 (Super ongelood 98/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	< 60	0	65.0	1	1

Diesel fuel grades

Table 2.61 summarizes the parameters for which exceedances were reported for the diesel fuel grades measured.

Table 2.61 Diesel fuel B7 (Diesel)

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	343.0	369.0	1	102
Sulphur content	mg/kg	< 10	4.7	11.4	1	102
FAME Content	% v/v	<7	0.1	7.3	1	102

2.21 Norway

2.21.1 Country details

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

2.21.2 Fuel quality monitoring service

Sampling

In Norway, the fuel quality monitoring system today is based on data from Certificates of Quality. SGS 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 south of Norway (Telemark, Vestfold and Agder) and in the winter period (November-December) the samples were taken in the east of Norway (Oslo, Akershus and Østfold). The samples were collected from different companies, making sure they were selected from all companies. Samples were collected according to EN 14274:2013.
From 2012 detailed information is only required every 3 years. Thus, no detailed information is required for 2019.

Fuel quality monitoring system administration

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 1st to 31st of May and 1st to 30th of September.

2.21.3 Sales

Table 2.62 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 (95 BF))	5.0	1 009 387	760 640	20	20	19 of 19
Unleaded petrol (minimum 95 =< RON < 98) E5 (E5 (98 BF))	0	18 970	14 228			0 of 19
Total petrol		1 028 357	774 868	20	20	
Diesel fuel B7 (B7)	7.0	2 928 062	2 443 072	12	12	6 of 7
Total diesel		2 928 062	2 443 072	12	12	

2.21.4 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.

2.22 Poland

2.22.1 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:	Refueling stations

2.22.2 Fuel quality monitoring service

Sampling

The tasks related to the system administration are performed by the President of the Office of Competition and Consumer Protection, while scrutiny of fuel quality is carried out by the Trade Inspectorate. Samples taken during inspection are tested in laboratories that have accreditation certificates issued by the Polish Centre for Accreditation. Tests of fuel samples verify all or some of the parameters laid down in the legislation.
Poland has adopted an FQMS defined in EN 14274 statistical model B. In the process of developing the new system, account was taken of the specific characteristics of the Polish fuel market, and special solutions were introduced to make it possible to initiate inspections not only based on statistical factors but also based on any information on fuel of poor quality. Thus, the system is used to pursue yet another objective, namely to try to eliminate fuel that is not compliant with quality requirements laid down in the legislation and to prevent it from being placed on the market.

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 is a large sized country, using statistical model B to monitor fuel quality. The country is divided into 16 macro-regions.

National legislation that transposed the Fuel Quality Directive

From 1 January 2007 onwards, the Act of 25 August 2006 on fuel quality monitoring and scrutiny constitutes the legal basis for the system's operation. The scrutiny system covers the whole fuel distribution chain — from filling stations, through wholesalers and fuel bases, to fuel producers. All types of fuel available on the market are subject to scrutiny: petrol (unleaded 95 and 98); diesel fuels; liquid biofuels; liquid petroleum gas; compressed natural gas; and light heating fuel.
Tests of fuel samples verify all or some of the parameters laid down in the legislation. The administrator of the fuel quality monitoring and control system determines the minimum number of business entities subject to inspection. However, it is also possible to initiate an inspection upon obtaining information about poor quality of fuels or circumstances indicating the possibility of poor quality of fuels (in practice, this includes complaints from drivers and information from the police and the Central Bureau of Investigation).

Reporting periods

Seasonal periods in Poland are as follows:

- summer: from 1 May to 30 September;
- 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.

2.22.3 Sales

Table 2.63 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	5 823 349 392	4 425 038	204	230	19 of 19
Unleaded petrol (minimum RON >= 98) E5 (RON98)	5.0	532 395 782	405 789	68	91	19 of 19
Total Petrol		6 355 745 174	4 830 827	272	321	
Diesel fuel B7 (ON)	7.0	20 864 700 000	17 460 000	206	224	7 of 7
Total Diesel		20 864 700 000	17 460 000	206	224	

2.22.4 Exceedances of the fuel quality limits

Petrol fuel grades

Table 2.64 and Table 2.65 summarize the parameters for which exceedances were reported for the petrol fuel grades measured.

Table 2.64 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
RON	-	> 95	94.3	96.8	1	434
Aromatics	% v/v	< 35	22.2	36.1	1	430

Table 2.65 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
Vapour pressure, DVPE	kPa	< 60	54.6	88.2	2	159

Diesel fuel grades

Table 2.66 summarizes the parameter for which exceedances were reported for the diesel fuel grades measured.

Table 2.66 Diesel fuel B7 (ON)

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	3.0	43.3	1	430

2.23 Portugal

2.23.1 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:	Refueling stations

2.23.2 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 analyzes" 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. Analysis is 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. Non-compliant samples are reported to the Food Safety and Economic Authority (ASAE). Two refineries supply the market, one in the north (Matosinhos Refinery) and the other in the south (Sines Refinery).

National legislation that transposed the Fuel Quality Directive

The transposition of the FQMS is set out in Articles 13 and 14 of Decree-Law No 89/2008 of 30 May, amended by Decree-Law No 142/2010 of 31 December and Decree-Law No 214-E/2015 of 30 September and by Decree-Law nº 152-C/2017 of 11 December.

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 performed at filling stations in transitional periods are not considered for the purposes of the FQMS.

2.23.3 Sales

Table 2.67 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 (Eurosuper)	1.28	1 314 312 277	980 476	13	45	19 of 19
Unleaded petrol (minimum RON ≥ 98) E5 (Superplus)	0.8	115 550 730	87 125	2	2	19 of 19
Total petrol		1 429 863 007	1 067 602	15	47	
Diesel fuel B7 (Gasóleo)	5.51	5 487 608 328	4 609 694	65	75	6 of 7
Total diesel		5 487 608 328	4 609 694	65	75	

2.23.4 Exceedances of the fuel quality limits

Petrol fuel grades

Table 2.68 summarizes the parameters for which exceedances were reported for the petrol fuel grades measured.

Table 2.68 Unleaded petrol (minimum 95 ≤ RON < 98) E5 (Eurosuper)

Parameter	Unit	Limit value	Minimum value measured	Maximum value measured	Number of samples outside tolerance limit	Total number of samples
RON	--	> 95	86.7	96.6	3	53
MON	--	> 85	77.1	86.4	1	53
Aromatics	% v/v	< 35	19.7	64.2	3	58
Oxygen content (petrol with 5 % (v/v) or less ethanol content)	% m/m	< 2.7	0.57	15.52	5	58
Sulphur content	mg/kg	< 10	5.0	32.0	2	58

Diesel fuel grades

No exceedances of the diesel fuel quality limits were reported.

2.24 Romania

2.24.1 Country details

Responsible organisation:	Ministry of Economy, Energy and Business Environment of Romania
Country size:	Small
Summer period:	1 May to 30 September
FQMS used:	EN 14274 Statistical Model A
Location of sampling:	Refueling stations

2.24.2 Fuel quality monitoring service

Sampling

Sampling is under the specifications of SR EN 14274:2013, respecting SR EN 14275:2013. The Ministry of Energy is receiving the data from an association of two companies (SGS Romania and RQC), which have been designated for sampling, analysis, and reporting, following a public procurement procedure. Samples are taken in refueling stations and, from 2019, in terminals/depots. Sampling is planned to be performed twice each year, and from 2020, samples will be collected in a single sampling activity carried out in the winter and summer periods. In 2018, tests were taken during the summer period, due to the change of legislation covering FQMS (repeal the Government Decision no. 928/2012 and 935/2011 and adoption of the Law no. 311/2018 for adopting of OUG 80/2018) and approval of specific regulations for the National System in August-September 2019 (Order of the Minister of Energy no. 569/2019).

Fuel quality monitoring system administration

Ministry of Energy is covering the sampling system through the Directorate General of Oil and Natural Gas. The gathering of information about 2018 sales is updated under the new legislation approved in 2018 (Emergency Government Ordinanceno. 80/2018 approved by Law no. 311/2018) and 2019 (Order of the Ministry of Energy nr. 569/2019). Romania is a small sized country, using statistical model B to monitor fuel quality. The country is divided into 8 macro-regions.

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 byLaw no. 311/2018, with the additional specifications of Order of the Ministry of Energy nr. 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.

2.24.3 Sales

Table 2.69 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	1 680 769 818	1 366 300	0	50	18 of 19
Unleaded petrol (minimum RON >= 98) E10 (Benzină COR-98)	8.0	223 141 164	179 989	0	50	17 of 19
Total Petrol		1 903 910 982	1 546 288	0	100	
Diesel fuel B7 (Motorină)	6.5	7 703 394 547	6 547 885	0	50	6 of 7
Total Diesel		7 703 394 547	6 547 885	0	50	

2.24.4 Exceedances of the fuel quality limits

Petrol fuel grades

No exceedances of petrol diesel fuel quality limits were reported.

Diesel fuel grades

No exceedances of the diesel fuel quality limits were reported.

2.25 Slovakia

2.25.1 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:	Refueling stations

2.25.2 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). Fuel sampling was carried out at refueling stations only. Fuel sampling was carried out during both summer and winter periods, and the sampling locations were selected from a database of refueling 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 FQM Directive are the Ministry of Environment and the Slovak Inspection of Environment. Fuel sampling was carried out by a contracted institution (VÚRUP), 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 Ministry of the Environment at the end of July 2020 for 2019. 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.

National legislation that transposed the Fuel Quality Directive

The FQD has been 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.

2.25.3 Sales

Table 2.70 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 (Super 95)	4.6	721 078 386	541 097	108	95	19 of 19
Unleaded petrol (minimum RON ≥ 98) E5 (Super Plus 98)	0	37 951 494	28 516	16	24	19 of 19
Total petrol		759 029 880	569 613	124	119	
Diesel fuel B7 (Diesel)	6.9	2 421 220 479	2 032 372	108	112	6 of 7
Total diesel		2 421 220 479	2 032 372	108	112	

2.25.4 Exceedances of the fuel quality limits

Petrol fuel grades

Table 2.71 summarize the parameters for which exceedances were reported for the petrol fuel grades measured.

Table 2.71 Unleaded petrol (minimum 95 ≤ RON < 98) E5 (Super 95)

Parameter	Unit	Limit value	Minimum value measured	Maximum value measured	Number of samples outside tolerance limit	Total number of samples
RON	--	> 95	93.8	98.3	1	203
MON	--	> 85	84.1	86.9	1	203
Vapour pressure, DVPE	kPa	< 60	56.5	67.1	2	108

Diesel fuel grades

Table 2.72 summarizes the parameters for which exceedances were reported for the diesel fuel grades measured.

Table 2.72 Diesel fuel B7 (Diesel)

Parameter	Unit	Limit value	Minimum value measured	Maximum value measured	Number of samples outside tolerance limit	Total number of samples
Cetane number	-	> 51	46.0	62.9	1	220
Sulphur content	mg/kg	< 10	1.76	13.1	1	220
FAME content	% v/v	< 7	0	9.3	2	220

2.26 Slovenia

2.26.1 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:	Refueling stations

2.26.2 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 http://okolje.arso.gov.si/onesnazevanje_zraka/vsebine/kakovost-tekocih-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 refueling 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: (Zakon o varstvu okolja;http: //www.pisrs.si/Pis.web/pregledPredpisa?id=ZAKO1545) and following regulations:

- 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),
- 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) 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. 35/18).

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.

2.26.3 Sales

Table 2.73 Total sales and sample number

Fuel grade (name)	Biofuel content (% v/v)	Total sales		Samples		Parameters measured
		Litres	Tonnes	Summer	Winter	
Unleaded petrol (minimum 95 ≤ RON < 98) E5 (NBM 95)	5.0	497 124 793	375 329	56	55	19 of 19
Unleaded petrol (minimum RON ≥ 98) E5 (NBM 98)	5.0	43 017 827	32 478	10	12	18 of 19
Total petrol		540 142 620	407 807	66	67	
Diesel fuel B7 (B7)	7.0	2 303 340 253	1 945 742	81	96	6 of 7
Total diesel		2 303 340 253	1 945 742	81	96	

2.26.4 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.

2.27 Spain

2.27.1 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, refueling stations and terminals

2.27.2 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 6 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.
- Refueling stations: samples were taken from service stations from different regions of the country.

For 2019, some samples have been taken from refineries and less samples have been taken of the "Gasolina 98" product, as this grade comprises <10 % of total petrol sales.

Fuel quality monitoring system administration

Spain is defined as a large sized country regarding fuel sales, 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 six 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 Waiver has been granted to Spain. Samples were taken and tested during transition periods.

2.27.3 Sales

Table 2.74 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)	3.76	6 615 973 338	4 975 212	100	100	19 of 19
Unleaded petrol (minimum RON ≥ 98) E5 (Gasolina 98)	3.76	531 739 721	399 868	11	11	19 of 19
Total petrol		7 147 713 059	5 375 080	111	111	
Diesel fuel B7 (Gasóleo A)	7.06	27 661 384 970	23 373 870	100	100	7 of 7
Total diesel		27 661 384 970	23 373 870	100	100	

2.27.4 Exceedances of the fuel quality limits

Petrol fuel grades

Table 2.75 and Table 2.76 summarize the parameters for which exceedances were reported for the petrol fuel grades measured.

Table 2.75 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
RON	--	> 95	94.4	98.3	1	169
Aromatics	% V/V	< 35	20.19	37.5	1	180
Benzene	% V/V	< 1	0.48	1.1	2	180
Sulphur content	mg/kg	< 10	3	12.3	1	199

Table 2.76 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
Benzene	% V/V	< 1	0.51	1.1	1	14

Diesel fuel grades

Table 2.77 summarizes the parameters for which exceedances were reported for the diesel fuel grades measured.

Table 2.77 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
Sulphur content	mg/kg	< 10	0.1	13.2	3	189

2.28 Sweden

2.28.1 Country details

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

2.28.2 Fuel quality monitoring service

Sampling

The Swedish fuel quality model is based on a National system. The Swedish Petroleum and Biofuels Institute compile 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 2019 there were 658 samples of Unleaded Petrol 95, 62 samples of Unleaded Petrol 98 and 825 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 2019 (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 refueling stations by 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); Skellefteå, Sundsvall, Västerås, Göteborg and Trelleborg. The refueling stations also represented five different fuel companies. The samples where then analyzed according to the same test methods as in this Excel template and to what is required in SS-EN 14274:2003 and SS-EN 14275:2003. The samples from the refueling stations (crosschecking) showed good equivalency for both petrol and diesel with this report based upon quality data of the deliveries to the terminals except for an exceedance that was found at sampling from an actual refueling station. A diesel sample from that station contained a slightly higher content of fame. The Swedish Transport Agency has been in contact with the responsible fuel company and received an explanation as to why this could have happened. The analysis report for the crosschecking at refueling stations in 2019 is available from The Swedish Transport Agency upon request. The same goes for the analysis reports from 2012-2018. The Swedish Transport Agency plans to do a similar crosschecking at actual refueling stations in the summer of 2020 to also verify the upcoming 2020 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 7a-7d). The Swedish Energy Agency is responsible for Article 7a-7d of the FQD. This FQMS report is in other words under the responsibility of 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 Swedish Petroleum and Biofuels Institutes compilation for this 2019 fuel quality report. The sampling at the actual refueling stations in 2019 (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, we are confident that The

Swedish Petroleum and Biofuels Institutes compilation of quality data for the FQMS Report gives a correct picture of the fuel quality situation in Sweden for 2019. There are no indications that the fuel quality was a problem in 2019.
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 supervises most parts of the national fuel regulation including fuel quality and is thereby the authority responsible for taking action 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 Climate Action and the Swedish Ministry of the Environment and Energy, in October 2014, by means of (EU-pilot 6321/14/CLIM).
There are 3 national refineries in Sweden, producing automotive fuels and 32 distribution terminals.

National legislation that transposed the Fuel Quality Directive

The legislation regarding fuel quality has been transposed into the national law *Drivmedelslag* (2011:319), the national regulation *Drivmedelsförordning* (2011:346) and regulations adopted by the Swedish Transport Agency; Transportstyrelsens föreskrifter 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 regulations require appropriate information to be supplied to consumers concerning the biofuel content, and in particular the FAME content of diesel fuel in accordance with Article 4(1) of the FQD. This is in accordance with EU-pilot 6321/14/CLIM. In addition, TSFS 2011:66 and TSFS 2015:14 contain a demand for information to customers about other additives (ethanol content in Article 3.3 and metallic additives in Article 8(a) 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 Article 8(a)2 of Directive 98/70/EC.
Drivmedelslag (2011:319) contains, among other things, the fuel specifications (Articles 3 and 4 of the FQD) and standard references, among them SS EN 228. The environmental classes for petrol (bensin) can be found in Sections 4-6. There are two environmental classes for petrol in Sweden. Petrol environmental class 1, in the law, equates to the former national standard SS 155422. This standard is now included as a national appendix of EN 228. Petrol in environmental class 2, known as *Bensin i miljöklass* 2, equates to EN 228 and Annex 1 of the FQD. There are also three environmental classes for diesel in Sweden. Environmental classes 1 and 2 for diesel equate to the national standard SS 155435. The environmental classes for diesel can be found in Sections 8-10. Diesel environmental class 3 equates to EN 590 and Annex 2 of the FQD. Environmental class 1 for both petrol and diesel represents the largest volumes of those fuels sold on the Swedish market.
The specific regulation on annual FQMS reporting, Article 8 of the FQD, is found in Section 19 of the national law *Drivmedelslag* (2011:319) and in Sections 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 Waiver has been granted, as Sweden has low ambient summer temperatures. Transition periods between summer and winter grades of petrol vary between the northern and the southern parts of Sweden. 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.

2.28.3 Sales

Table 2.78 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 MK1)	5.0	2 808 649 566	2 106 487	324	334	13 of 19
Unleaded petrol (minimum 95 =< RON < 98) E5 (Blyfri 98 MK1)	5.0	95 848 434	71 886	48	14	13 of 19
Total petrol		2 904 498 000	2 178 373	372	348	
Diesel fuel B7 (Diesel MK1)	7.0	5 944 817 000	4 839 081	411	414	6 of 7
Total diesel		5 944 817 000	4 839 081	411	414	

2.28.4 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.

2.29 United Kingdom

2.29.1 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 refueling stations

2.29.2 Fuel quality monitoring service

Sampling

Sampling is done at refineries, terminals and refueling stations. Samples are done routinely throughout the year and across all regions of the UK; the numbers for each month are shown in the petrol and diesel sheets showing the test results. For unleaded petrol and diesel, the number of samples taken from retail stations are over the largest number required by any of the statistical models of EN 14274. The addition of the sample results from refineries and terminals adds over 3 000 extra results that increases the certainty about the fuel being supplied and as such, provides an approach with an equivalent, or greater, degree of confidence to EN 14274. The test methods used for each parameter are in accordance with the current EN 228 & EN 590 standards and are performed by certified laboratories of refiners or independent test labs.

Fuel quality monitoring system administration

The Department for Transport has responsibility in the UK for implementing the Fuel Quality Directive and oversees the fuel quality monitoring system. The UK fuel quality monitoring system makes use of industry quality analyses on batches of fuel produced in, or imported into, the UK, plus samples taken at distribution terminals and service stations (to check for contamination in the distribution network). The National System has been operating for several years and considers a very large number of samples from across the year and across the UK to provide, with a suitable degree of confidence, a view of the quality of the fuel being supplied to the UK market. There are six operational fuels refineries within the UK and approximately 50 distribution terminals.

National legislation that transposed the Fuel Quality Directive

The Fuel Quality Directive is transposed in UK law under the Motor Fuel (Composition and Content) Regulations 1999 (SI No.3107) with amendments in 2001, 2003, 2007, 2010, 2012, 2013 & 2015.

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 UK has been granted the 'Arctic' derogation for vapour pressure in petrol during the summer period. The summer period is between the 1st of June and 31st of August, during which time the maximum vapour pressure allowed for petrol is 70 kPa. Vapour pressure samples are taken during the transitional period and reported for the winter results but are excluded from the full year results because they are transitional.

2.29.3 Sales

Table 2.79 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 (Unleaded 95 RON)	5.0	14 238 462 662	10 579 419	399	659	19 of 19
Unleaded petrol (minimum 95 ≤ RON < 98) E5 (Super 97+RON)	5.0	768 703 027	561 234	98	135	19 of 19
Total petrol		15 007 165 689	11 140 653	497	794	
Diesel fuel B7 (Diesel)	7.0	28 522 730 024	24 050 900	1 365	1 037	7 of 7
Total diesel		28 522 730 024	24 050 900	1 365	1 037	

2.29.4 Exceedances of the fuel quality limits

Petrol fuel grades

Table 2.80 and Table 2.81 summarize the parameters for which exceedances were reported for the petrol fuel grades measured.

Table 2.80 Unleaded petrol (minimum RON = 95) E5 (Unleaded 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	< 70	55.6	74.6	4	395
Aromatics	% v/v	< 35	14.7	36.4	1	1 030

Table 2.81 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
Vapour pressure, DVPE	kPa	< 70	52.5	77.1	4	94
Aromatics	% v/v	< 35	22.8	37.5	2	205
Sulphur content	mg/kg	< 10	2.4	10.7	1	199

Diesel fuel grades

Table 2.82 summarizes the parameters for which exceedances were reported for the diesel fuel grades measured.

Table 2.82 Diesel fuel B7 (Diesel)

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	2.3	11.8	2	2 480
FAME content	% v/v	< 7	0	7.4	1	2 343

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/ACM	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

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