

# Fuel quality monitoring in the EU in 2018

Fuel quality monitoring under the Fuel Quality Directive



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# 1 Quality of fuels

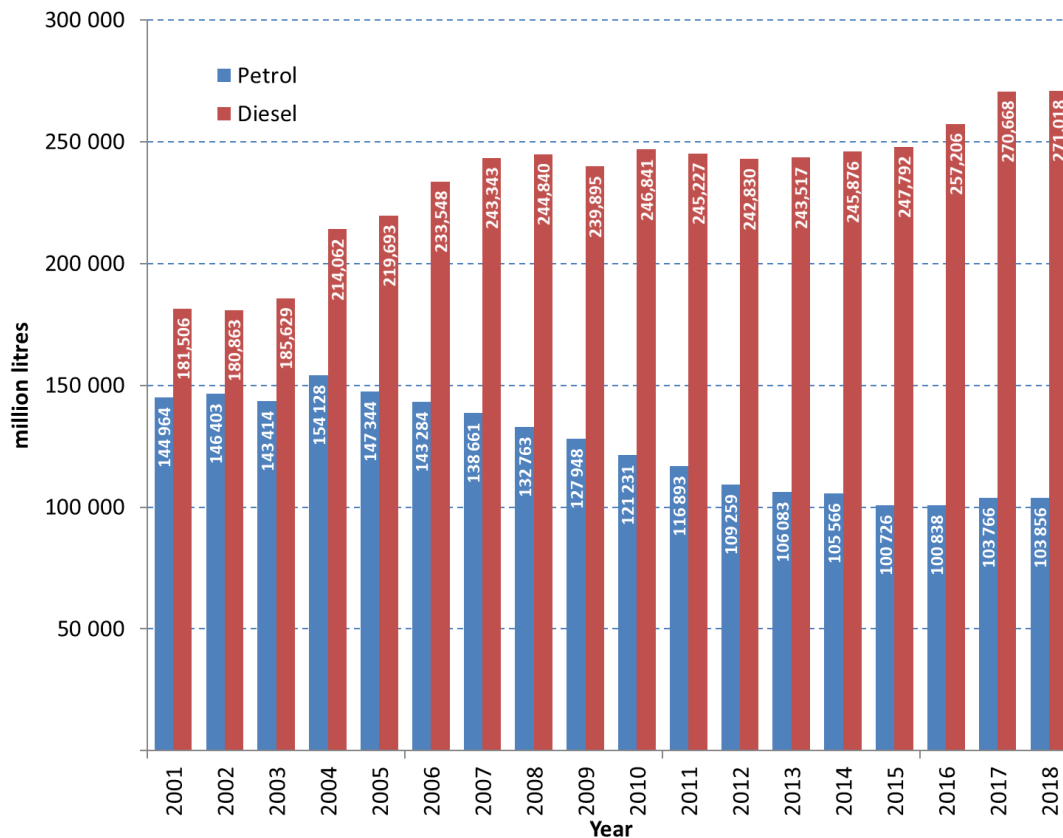
## 1.1 Fuel sales

Sales of fuels used for road transport in the EU continue to be dominated by diesel: 72.3 % (271 018 million litres) of fuel sold was diesel and 27.7 % was petrol (103 856 million litres) <sup>(1)</sup>. Petrol and diesel sales in 2018 remained on the same levels when compared with 2017 (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 72.3 % in 2018 (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 13 % between 2009 and 2018, sales of petrol fuels decreased by 19 % during the same period.

Diesel and petrol vehicles are very similar in terms of CO<sub>2</sub> 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<sub>2</sub> per kilometre travelled as petrol cars <sup>(2)</sup>.

**Figure 1.1 EU petrol and diesel fuel sales in 2018 (million litres)**



<sup>(1)</sup> Fuels other than petrol and diesel are disregarded here, as the reporting under Article 8 of the FQD is limited to petrol and diesel, for which fuel specifications are laid down in Annexes I and II of the FQD.

<sup>(2)</sup> <https://www.eea.europa.eu/highlights/average-co2-emissions-from-new>  
<https://www.eea.europa.eu/publications/monitoring-co2-emissions-from-new-2/download>

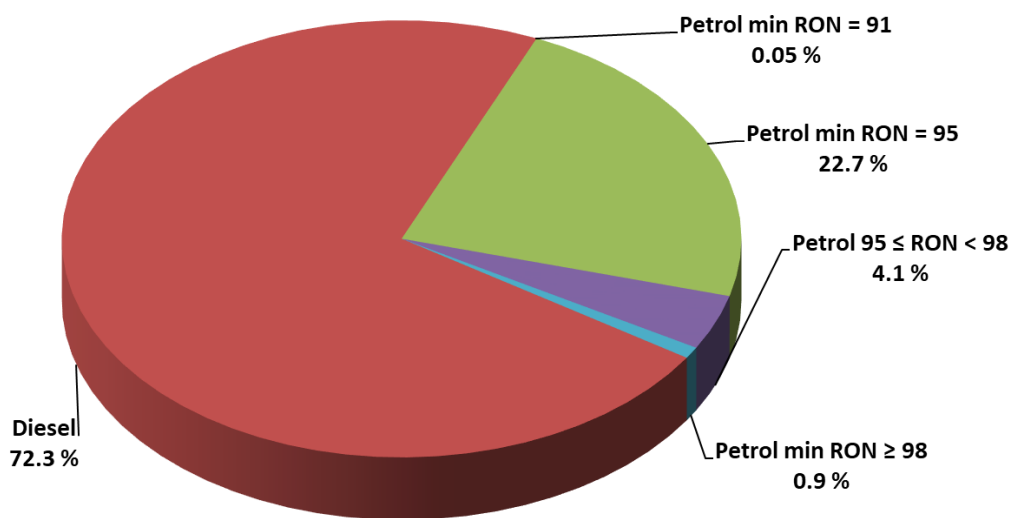
The majority of petrol sales in 2018 comprised fuels with a petrol grade research octane number (RON) of 95, which accounted for 82 % of the total petrol fuel sales; 14.7 % of sales were  $95 \leq \text{RON} < 98$ ; and 3.1 % were  $\text{RON} \geq 98$ . There was an insignificant proportion of less than 0.1 % for RON 91 grade.

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 <sup>(3)</sup>.

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**Figure 1.2** EU petrol and diesel fuel sales, 2018

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

The nine Member States with the highest volumes of fuel sold account for 80.0 % of total EU sales, while the 15 Member States with the lowest volumes account for 12.0 % of total EU fuel sales.

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<sup>(3)</sup> <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 2018.**

Member State	Minimum RON = 91	Minimum RON = 95	95 ≤ RON < 98	RON ≥ 98	Total petrol	Total diesel
million litres						
Austria	20	0	2 079	114	2 213	8 331
Belgium	0	0	1 821	490	2 311	8 039
Bulgaria	0	0	633	54	687	2 605
Croatia	0	627	0	40	667	2 027
Cyprus	0	430	0	30	460	387
Czechia	0	2 041	0	94	2 135	5 917
Denmark	140	1 649	0	0	1 789	3 315
Estonia	9	0	215	33	257	805
Finland	0	1 317	0	590	1,907	3 124
France	0	10 749	0	0	10 749	40 036
Germany	0	22 938	1 105	0	24 043	44 647
Greece	0	2 887	1	179	3 067	3 143
Hungary	0	1 866	0	94	1 960	4 354
Ireland	0	1 418	0	0	1 418	3 649
Italy	0	8 101	0	0	8 101	31 495
Latvia	0	216	0	24	240	1 211
Lithuania	0	304	0	10	314	2 038
Luxembourg	0	332	0	92	424	1 892
Malta	0	0	103	3	106	170
Netherlands	0	0	5 641	7	5 648	7 948
Poland	0	5 473	0	497	5 970	20 568
Portugal	0	0	1 270	106	1 376	5 351
Romania	0	874	0	75	949	2 641
Slovakia	0	0	727	13	740	2 388
Slovenia	0	0	645	44	689	2 018
Spain	0	6 245	0	520	6 765	27 779
Sweden	0	2 910	0	99	3 009	5 757
United Kingdom	0	14 811	1 054	0	15 865	29 384

## 1.2 Use of biocomponents

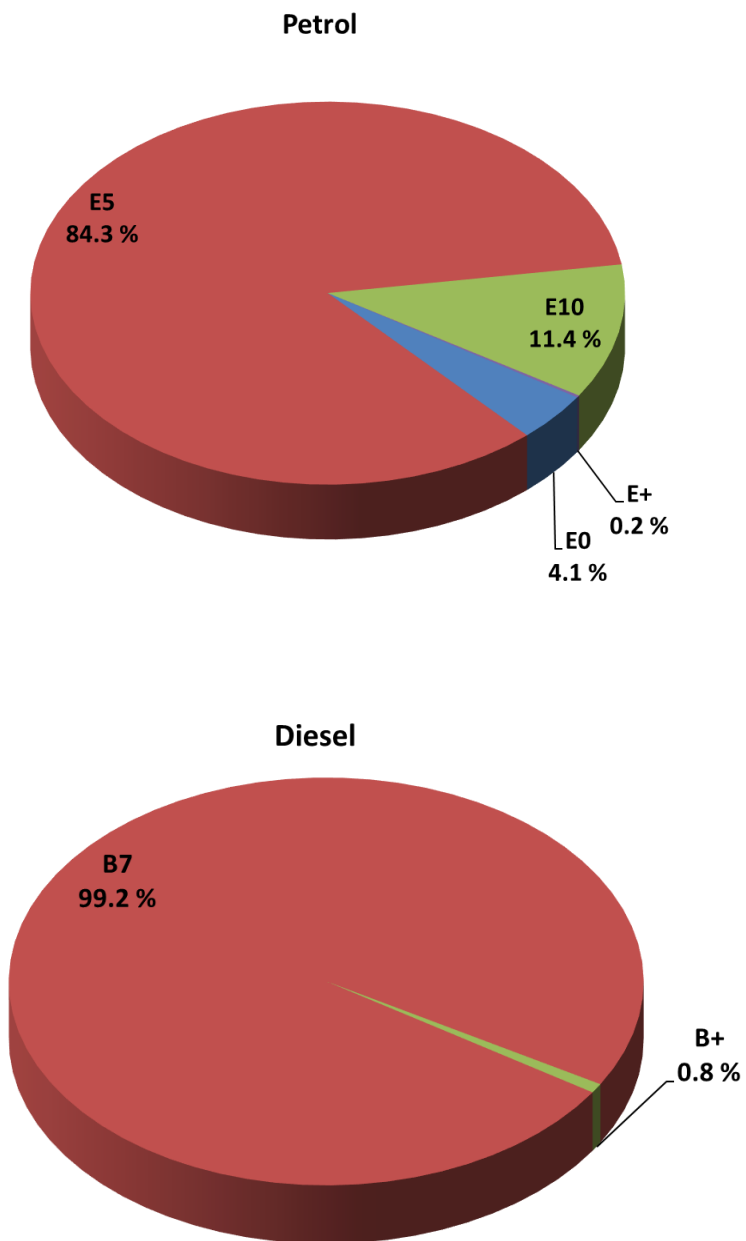
Almost all fuel sold in the EU in 2018 contained biocomponents (Figure 1.3). All diesel sold in the EU contained biodiesel, whereas nearly 96 % of all petrol sold contained bioethanol.

Of petrol sold in the EU in 2018, 84.3 % 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 11.4% was E10 (i.e. up to 10 % ethanol content by volume) and 4.1 % was E0 (no ethanol content). Only 0.2 % 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). The rather low proportion of B+ in 2018 in comparison to 2017 is due to legal changes in France restricting the FAME content from 8% to now 7%.



**Figure 1.3 Use of biocomponents in petrol and diesel fuels sold in the EU in 2018**

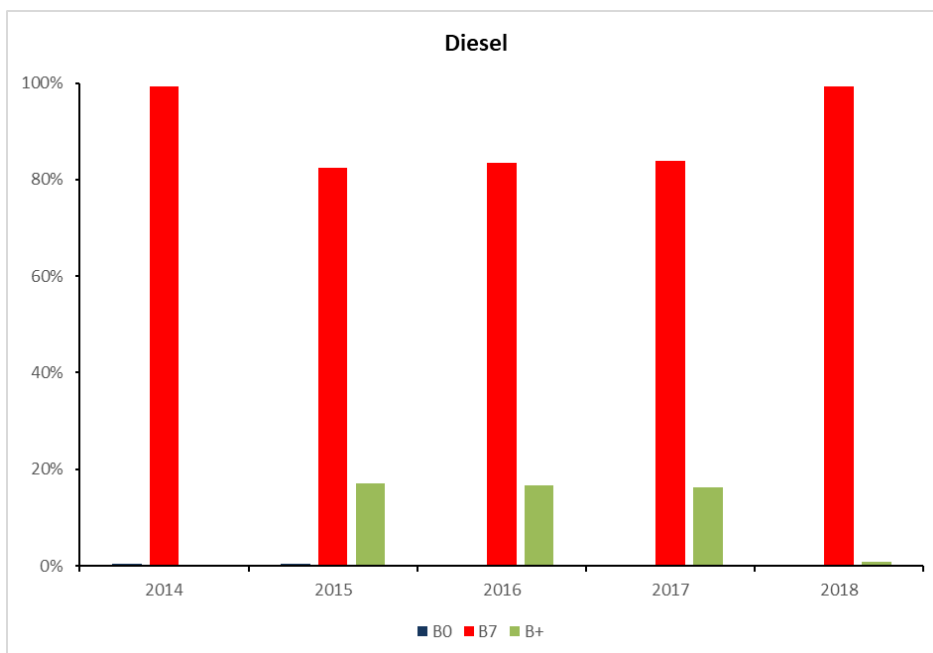
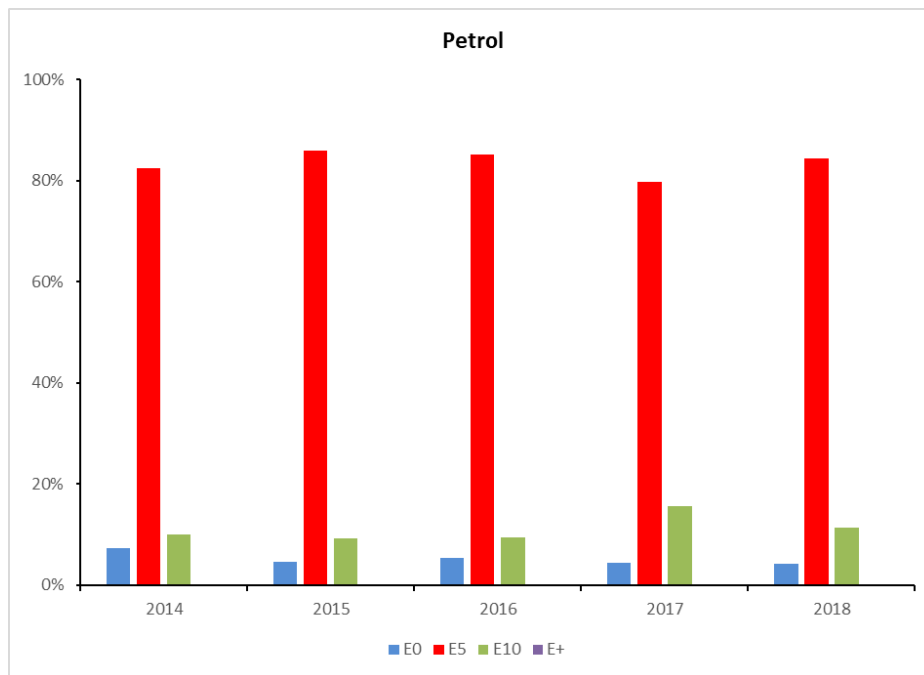


The share of ethanol-containing petrol (E5 and E10) in the EU has increased over the last five years, from about 93 % in 2014 to 96 % in 2018, as illustrated in Figure 1.4. Almost all diesel contained different levels of biodiesel over the same period. B+ changes significantly from 2014 to 2015 and from 2017 to 2018 because of changes in the French legislation allowing the concentration of biodiesel to be above 7 % between 2015 and 2017.

Whereas the use of different biocomponents results in lower overall GHG emissions, the reductions achieved depends greatly on the feedstock used for the production of biofuels as well as on the actual production pathways <sup>(4)</sup>.

<sup>(4)</sup> <https://www.eea.europa.eu/publications/quality-and-greenhouse-gas-intensities-1>

**Figure 1.4 Biocomponent in petrol and diesel sold in the EU from 2014 to 2018**



**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; 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 <sup>(a)</sup>	
				Petrol	Diesel
Austria	Statistical model A	Small	Yes	104	100
Belgium	National system	Small	Yes	National system	National system
Bulgaria	Statistical model A	Small	Yes	102	100
Croatia	Statistical model C	Small	Yes	100	100
Cyprus	Statistical model C	Small	Yes	102	100
Czechia	Statistical model C	Small	Yes	104	100
Denmark	Statistical model C	Small	Yes	104	100
Estonia	Statistical model C	Small	Yes	202	100
Finland	Statistical model A	Small	Yes	200	100
France	Statistical model A	Large	Yes	402	200
Germany	Statistical model B	Large	Yes	802	400
Greece	Statistical model A	Small	Yes	104	100
Hungary	Statistical model C	Small	Yes	102	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	102	100
Slovenia	Statistical model C	Small	Yes	102	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. N/A, not available (not reported by the Member State).

(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 14274:2003 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
<b>European Standard EN 14274</b>	
<b>European Standard EN 14274</b> <b>A: macro-regions</b>	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.
<b>European Standard EN 14274</b> <b>B: non-macro-regions</b>	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.
<b>European Standard EN 14274</b> <b>C: non-region model</b>	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.
<b>National model</b>	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 the Netherlands, 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 during the summer period only.

### 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:

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

**Table 1.4 Minimum number of samples per fuel grade in each winter and summer period**

Fuel grade	Country size	Statistical model		
		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 2018 were within the tolerance limits. In total, 410 non-compliances for petrol and 114 for diesel were reported for 2018 (Table 1.5).

One Member State (Belgium) reported more than 100 non-compliances for petrol and 30 for diesel in 2018. Despite this large number of non-compliances, it represents only a small fraction of the overall number of samples taken in Belgium, which is 7 811.

Seventeen Member States reported fewer than 10 non-compliances for petrol, six of which have reported full compliance (Bulgaria, Greece, Latvia, Lithuania, Slovenia and Sweden). Exceedances of the summer vapour pressure were reported in 19 Member States, exceedances of the RON were reported in ten Member States, exceedances of the motor octane number (MON) were reported in eight Member States, and exceedances of sulphur content were reported in five Member States.

Twenty-four Member States reported fewer than 10 non-compliances for diesel, twelve of which reported full compliance (Austria, Croatia, Estonia, Finland, Germany, Hungary Ireland, Lithuania, Poland, Romania, Slovenia and Sweden). Of the seven fuel parameters that require testing and analysis <sup>(5)</sup>, the most common parameters falling outside the specifications were the sulphur content (in eight Member States) and the FAME content (in 7 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.

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<sup>(5)</sup> 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 2018**

Member State	Samples taken (and samples required in brackets)		Number of non-compliances in 2018 (figures for 2017 in brackets)		Parameters outside tolerance limits for non-compliant samples
	Petrol	Diesel	Petrol	Diesel	
Austria	106 (100)	100 (100)	3 (0)	0 (2)	Vapour Pressure, DVPE
Belgium	4203 (National system)	3608 (National system)	141 (242)	30 (52)	RON, MON, Vapour Pressure, Oxygen content, Oxygenates (Ethanol), Sulphur content, Diesel Density, Diesel Sulphur content, FAME content, Diesel Distillation 95% point
Bulgaria	119 (102)	114 (100)	0 (0)	1 (0)	Diesel Sulphur content
Croatia	192 (104)	193 (100)	4 (3)	0 (0)	RON, Vapour Pressure
Cyprus	442 (102)	266 (100)	54 (36)	3 (0)	Vapour Pressure, Sulphur content, Diesel Sulphur content
Czechia	1015 (104)	1284 (100)	25 (12)	3 (1)	RON, MON, Vapour Pressure, Aromatics, Oxygen content, Diesel Sulphur content
Denmark	204 (104)	100 (100)	21 (27)	1 (2)	Vapour Pressure, Distillation - evaporated at 100°C, Aromatics, Olefins, Diesel Density
Estonia	240 (202)	170 (100)	3 (3)	0 (0)	RON, Vapour Pressure
Finland	200 (200)	103 (100)	3 (9)	0 (0)	Vapour pressure, Oxygen content, Aromatics
France	423 (402)	222 (200)	10 (15)	9 (9)	MON, Vapour pressure, Aromatics, Oxygen content, Cetane number, Diesel Distillation 95% point, FAME content
Germany	783 (802)	449 (400)	3 (15)	0 (1)	Vapour Pressure
Greece	114 (104)	100 (100)	0 (0)	19 (8)	FAME content
Hungary	120 (102)	120 (100)	3 (0)	0 (1)	MON
Ireland	100 (100)	100 (100)	1 (20)	0 (1)	Vapour Pressure
Italy	200 (200)	200 (200)	5 (6)	2 (2)	RON, MON, Vapour Pressure, Sulphur content, Diesel Distillation 95% point
Latvia	15 (National system)	26 (National system)	0 (4)	1 (0)	Diesel Distillation 95% point
Lithuania	103 (102)	100 (100)	0 (0)	0 (13)	-
Luxembourg	127 (National system)	62 (National system)	13 (15)	1 (4)	Vapour Pressure, Manganese, FAME content
Malta	110 (102)	104 (100)	3 (0)	1 (0)	RON, Vapour Pressure, Diesel Sulphur content
Netherlands <sup>6</sup>	100 (102)	100 (100)	0 (0)	0 (2)	-
Poland	535 (520)	412 (400)	11 (11)	0 (5)	RON, MON, Vapour Pressure, Aromatics
Portugal	522 (108)	535 (100)	60 (18)	5 (14)	RON, MON, Vapour Pressure, Aromatics, Oxygen content, Diesel Sulphur content
Romania	108 (102)	108 (100)	3 (-)	0 (0)	Distillation - evaporated at 100°C, Distillation - evaporated at 150°C, Benzene

<sup>(6)</sup> The Netherlands did not officially submit data, but the data left in draft mode in the Dutch data repository of the EEA from February 2020 has been taken into account.

Member State	Samples taken (and samples required in brackets)		Number of non-compliances in 2018 (figures for 2017 in brackets)		Parameters outside tolerance limits for non-compliant samples
	Petrol	Diesel	Petrol	Diesel	
Slovakia	207 (102)	186 (100)	11 (16)	31 (16)	RON, MON, Vapour Pressure, Aromatics, Cetane number, Diesel Distillation 95% point, Diesel Sulphur content, FAME content
Slovenia	127 (102)	162 (100)	0 (0)	0 (2)	-
Spain	400 (216)	200 (200)	15 (3)	3 (2)	Vapour Pressure, Benzene, Aromatics, Oxygen content, Sulphur content, FAME content
Sweden	776 (National system)	912 (National system)	0 (0)	0 (0)	-
United Kingdom	1212 (National system)	2920 (National system)	16 <sup>7</sup> (43)	4 (3)	Vapour Pressure, Aromatics, Diesel Sulphur content, FAME content
<b>Total</b>			<b>408 (498)</b>	<b>114 (138)</b>	

**Note:** The numbers of samples required per country are shown in Table 1.2. N/A, not available (not reported by the Member States).

### 1.5 Quality of Member States' reporting in 2018

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 2018, 26 EU Member States plus Iceland and Norway submitted their fuel quality reports in accordance with the requirements of Article 8 of the FQD. Netherlands did not submit a complete report. During the QA/QC procedure, the ETC/ACM reviewers posed in total 59 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;
- 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.

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, 16 Member States submitted revised data sets. The last resubmission was received in the beginning of April 2020.

With the exception of the Netherlands, which has not submitted a complete report, there were no outstanding issues that could not be resolved during the QA/QC procedure.

<sup>(7)</sup> Not including those related to national specifications only.

## 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:	Refuelling stations

#### 2.1.2 Fuel quality monitoring service

##### Sampling

The organisation responsible for sampling is Agrar Market Austria (AMA); analysing and reporting activities are performed by the Austrian Environment Agency (AEA). Samples are taken from refuelling stations that are selected at random, while the proportion of small and large marketers is constant. Each year, three campaigns are undertaken — two in winter (beginning and end of the year) and one in summer.

##### Fuel Quality Monitoring System administration

The Fuel Quality Directive (FQD) was implemented by the Austrian Federal Ministry of Agriculture, Forestry, Environment and Water Management. AMA and AEA are commissioned by the Ministry to perform the fuel quality monitoring in Austria. The samples were taken from refuelling stations three times a year (AMA campaigns) and brought to the AEA for analysis. Reporting starts when all samples from the previous year have been tested. After analysing the samples, non-compliant fuels are reported to the Ministry, where further legal action is taken. Austria is a small country, using statistical model A, as two refineries supply Austrian filling stations with fuels. Two macro-regions are defined (west and east) and samples are divided with respect to the population and number of filling stations.

##### National legislation that transposed the Fuel Quality Directive

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

##### Reporting periods

Seasonal periods in Austria are as follows:

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

There are no arctic weather conditions in Austria. Transition periods are defined as the periods from 1 to 31 October and from 1 March to 30 April. Samples taken within the transition periods are regarded as winter samples.



### 2.1.3 Sales

**Table 2.1.1 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)	4.8	20 459 226	15 331	3	0	19 of 19
Unleaded petrol (minimum 95 ≤ RON < 98) E5 (Super)	4.8	2 079 290 634	1 557 461	50	50	19 of 19
Unleaded petrol (minimum RON ≥ 98) E5 (Super Plus)	5.9	113 515 166	85 428	3	0	19 of 19
Total petrol		2 079 424 608	1 658 220	56	50	
Diesel fuel B7 (Diesel)	6.6	8 330 793 408	6 988 703	50	50	6 of 7
Total diesel		8 330 793 408	6 988 703	50	50	

### 2.1.4 Exceedances of the fuel quality limits

#### Petrol fuel grades

Table 2.1.2 and Table 2.1.3 summarize the parameters for which exceedances were reported for petrol fuels.

**Table 2.1.2 Regular unleaded petrol (minimum RON = 91) E5 (Normal)**

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	69.3	2	3

**Table 2.1.3 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	57.5	66.1	1	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:	Refuelling stations and terminals

### 2.2.2 Fuel quality monitoring service

#### Sampling

The ISO EN 17020 certified organization, Fapetro, is responsible for the reporting of the fuel quality in Belgium. Belgium uses a national system which controls many more parameters than are imposed by the statistical models. Belgium takes samples at refuelling stations, depots and pumps with private owners. Only samples for refuelling stations and depots are reported here. Petrol at depots is not taken due to blending issues. The partition of taken samples is adapted at the volume of fuel sold on the Belgian market, so mainly diesel samples are taken.

#### Fuel quality monitoring system administration

The International Organization for Standardization (ISO) EN 17020-certified organization, Fapetro, is responsible for the reporting of fuel quality in Belgium. Belgium is a small country using a national system. Eleven macro-regions are defined and samples are divided with respect to the population and number of filling stations/ terminals.

The transition periods are used to give the fuel producers the ability to adapt the production of the fuel quality in order to meet the specifications of the summer or winter fuel quality. Every year Fapetro notices a boost of dry vapour pressure equivalent (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 didn't 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, concerning petrol, were due to low rotation of stocks in transition periods between winter and summer grades.

#### 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.

#### 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.

### 2.2.3 Sales

**Table 2.2.1 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)	0.0	1 820 805 587	1 356 500	1685	545	19 of 19
Unleaded petrol (minimum RON ≥ 98) E5 (Essence98/Benzine98)	0.0	489 641 735	364 783	1661	312	19 of 19
Total petrol		2 310 447 322	1 537 438	3346	857	
Diesel fuel B7 (Diesel10S)	0.1	8 038 912 705	6 696 414	1397	2211	7 of 7
Total diesel		8 038 912 705	6 696 414	1397	2211	

**Note:** RON, research octane number.

### 2.2.4 Exceedances of the fuel quality limits

#### Petrol fuel grades

Table 2.2.2 and Table 2.2.3 summarize the parameters for which exceedances were reported for petrol fuels.

**Table 2.2.2 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	91.7	98.3	1	188
Motor octane number	-	> 85	83.2	88.6	16	1513
Vapour pressure, DVPE	kPa	< 60	53	82.3	33	1685
Oxygen content (petrol with 5 % (v/v) or less ethanol content)	% m/m	< 2.7	1.5	4.19	4	1513
Ethanol	% v/v	< 10	0.8	11.37	5	1513
Sulphur content	mg/kg	< 10	3	18.95	2	187

**Table 2.2.3 Unleaded petrol (minimum RON  $\geq$  98) E5 (Essence98/Benzine98)**

Parameter	Unit	Limit value	Minimum value measured	Maximum value measured	Number of samples outside tolerance limit	Total number of samples
Research octane number	-	> 95	92.4	100	1	198
Vapour pressure, DVPE	kPa	< 60	54.9	87.85	79	1661

### Diesel fuel grades

Table 2.2.4 summarizes the parameters for which exceedances were reported for the diesel fuel grades measured.

**Table 2.2.4 Diesel fuel B7 (Diesel10S)**

Parameter	Unit	Limit value	Minimum value measured	Maximum value measured	Number of samples outside tolerance limit	Total number of samples
Density at 15 °C	kg/m <sup>3</sup>	< 845	821.9	852	3	3 608
Distillation 95 % point	°C	< 360	322.5	393.4	2	3 608
Sulphur content	mg/kg	< 10	3	14.3	5	3 608
Fatty acid methyl ester content	% v/v	< 7	0.05	35.1	20	3 607

## 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: Refuelling stations and terminals

### 2.3.2 Fuel quality monitoring service

#### Sampling

Control of liquid fuel quality is performed by the President of the State Agency for Metrological and Technical Surveillance (SAMTS) via the Directorate-General for Quality Control of Liquid Fuels (DG QCLF). DG QCLF officials are authorised by the President of SAMTS to take samples of liquid fuels, to test them and to report their results. DG QCLF staff inspected liquid fuels in refineries, petroleum depots and terminals, refuelling stations, and mobile tanks for liquid fuel transport. Locations were chosen by region, determined in proportion to the annual fuel consumption in each region, and using randomisation software. Each location has a unique identification number. The samples taken for the purposes of control were tested in a mobile laboratory and in the permanently sited laboratory of the DG QCLF.

## Fuel quality monitoring system administration

The organisations responsible for management and implementation of the FQD are the Ministry of Environment and Water, and SAMTS-DG QCLF. Bulgaria is a small country, using statistical model A for a small country. Six macro-regions are defined and samples are divided with respect to the population and number of filling stations.

The DG QCLF is a public body responsible for taking actions where infringements are found in liquid fuel control. Every month, every 3 months and every year, the DG QCLF provides data on the SAMTS website on the number of inspections, the number of cases of non-compliance, and the number and type of administrative measures imposed during the reference period.

## National legislation that transposed the Fuel Quality Directive

European liquid fuel quality legislation has been introduced into Bulgarian legislation by the Clean Ambient Air Act, the Energy from Renewable Sources Act and the Regulation on the quality requirements, conditions, order and control of liquid fuels. The Clean Ambient Air Act and the Regulation on the quality requirements, conditions, order and control of liquid fuels implement the requirements of Directive 98/70/EC and Standards EN 228 and EN 590.

## Reporting periods

Seasonal periods in Bulgaria are as follows:

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

A vapour pressure waiver has been granted to Bulgaria. Transition periods are defined as the period from 16 October to 30 November and from 16 April to 31 May.

Results included in the report are for samples taken and tested in the summer and winter periods, with the exception of two samples of RON 95 petrol and five samples of diesel fuel taken in the summer-winter transition period. This was because, in the relevant Bulgarian legislation, there are no transition periods concerning seasonal specifications for manufacturers and importers.

### 2.3.3 Sales

**Table 2.3.1 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	632 881 594	474 661	59	50	19 of 19
Unleaded petrol (minimum RON ≥ 98) E10 (Unleaded petrol RON ≥ 98 E10)	10.0	53 618 065	40 213	5	5	19 of 19
Total petrol		686 499 659	514 874	64	55	
Diesel fuel B7 (Diesel fuel B7)	7.0	2 605 155 964	2 214 382	61	53	7 of 7

### 2.3.4 Exceedances of the fuel quality limits

#### 2.3.4.1 Petrol fuel grades

No exceedances of the petrol fuel quality limits were reported.

#### 2.3.4.2 Diesel fuel grades

Table 2.3.2 summarizes the parameters for which exceedances were reported for the diesel fuel grades measured.

**Table 2.3.2 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
Sulphur content	mg/kg	< 10	5	56.1	1	114

## 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: Refuelling stations and terminals

### 2.4.2 Fuel quality monitoring service

#### Sampling

The organisation responsible for sampling, analysis and reporting is the Ministry of Environment and Energy. The locations at which sampling is carried out by inspection body type A, accredited by norm EN 17025, are terminals and filling stations. The samples are taken each month of the year at refuelling stations and terminals, according to the 'Fuel quality monitoring programme', which is under the responsibility of the Ministry of Environment and Energy:

- Samples of heavy fuel oil, heating oil and gas oil are taken in accordance with the fuel quality monitoring programme, which is under the responsibility of the Ministry of Environmental and Energy. The Ministry sets out the 'Fuel quality monitoring programme' a year in advance.
- Sampling from terminals is in accordance with Standard HRN EN ISO 3170.
- Sampling from petrol stations is in accordance with Standard HRN EN ISO 14275.
- Determining sulphur content is in accordance with Standard EN ISO 8754 or 14596.
- Reference method used for determining the precision of the testing method and the interpretation of test results is in accordance with Standard HRN EN ISO 4259.

#### Fuel quality monitoring system administration

The Ministry of Environment and Energy is responsible for the reporting of fuel quality in Croatia. Croatia is a small sized country, using statistical model C. The whole country is defined as a macro-region.

## National legislation that transposed the Fuel Quality Directive

The Fuel Quality Directive 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 greenhouse gas 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, and the results of analyses were reported throughout the year.

### 2.4.3 Sales

**Table 2.4.1 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)	0.0	626 712 726	473 168	95	84	19 of 19
Unleaded petrol (minimum 95 ≤ RON < 98) (RON=98)	0.0	140 892	106	1	1	19 of 19
Unleaded petrol (minimum RON ≥ 98) (RON=100)	0.0	40 348 533	30 463	5	6	19 of 19
Total Petrol		667 202 150	503 738	101	91	
Diesel fuel B7 (B7)	0.0	2 027 014 477	1 712 827	97	96	7 of 7
Total Diesel		2 027 014 477	1 712 827	97	96	

### 2.4.4 Exceedances of the fuel quality limits

#### Petrol fuel grades

Table 2.4.2 summarises the parameters for which exceedances were reported for the petrol fuel grades measured.

**Table 2.4.2 Unleaded petrol (minimum RON = 95) (RON = 95)**

Parameter	Unit	Limit value	Minimum value measured	Maximum value measured	Number of samples outside tolerance limit	Total number of samples
Research octane number	-	> 95	94	96.8	3	178
Vapour pressure, DVPE	kPa	< 60	47	61.7	1	95

#### Diesel fuel grades

No exceedances of the diesel fuel quality limits were reported.

## 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:	Refuelling 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 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 2018 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 2018, 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 quality of fuels marketed in Cyprus. Cyprus is a small sized country, using statistical model C and is considered as a single region. The supply-import of petrol and diesel is carried out by four companies and distribution and retail are carried out by 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 30 September;
- 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 2.5.1 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%	429 981 213	316 163	150	92	18 of 19
Unleaded petrol (minimum RON ≥ 98) (Unleaded Gasoline-Petrol RON 98)	0.0%	30 011 075	22 067	118	82	18 of 19
Total Petrol		459 992 288	338 230	268	174	
Diesel fuel B7 (Eurodiesel)	7.0%	386 961 799	0	157	109	7 of 7
Total Diesel		386 961 799	0	157	109	

### 2.5.4 Exceedances of the fuel quality limits

#### Petrol fuel grades

Table 2.5.2 and Table 2.5.3 summarize the parameters for which exceedances were reported for the petrol fuel grades measured.

**Table 2.5.2 Unleaded petrol (minimum RON = 95) (Unleaded Gasoline- Petrol RON 95)**

Parameter	Unit	Limit value	Minimum value measured	Maximum value measured	Number of samples outside tolerance limit	Total number of samples
Vapour pressure, DVPE	kPa	< 60	51.8	79.3	23	150

**Table 2.5.3 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	77.8	30	118
Sulphur content	mg/kg	< 10	2	12	1	138

#### Diesel fuel grades

No exceedances of the diesel fuel quality limits were reported.

## 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:	Refuelling stations

### 2.6.2 Fuel quality monitoring service

#### Sampling

The monitoring system of the fuel quality is coordinated by the Ministry of Industry and Trade of the Czech Republic (MIT) in the whole country. The Czech Trade Inspection Authority (CTIA), which comes under the jurisdiction of the Ministry of Industry and Trade of the Czech Republic, performed the sampling of liquid and gas fuels at service stations, in cooperation with Accredited Inspection and Certification Authority SGS for laboratory testing of all samples, which were used in transport sector over the year 2018. The fuel samples were tested monthly throughout of the year 2018. The controlling process of all fuel samples has been carried out by the last amended of 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 Czech Republic'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.

Currently, there are two refineries and around 31 distribution terminals in the Czech Republic. 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.

#### 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.

### Reporting periods

Seasonal periods in Czech Republic 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.

### 2.6.3 Sales

**Table 2.6.1 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 (0)	4.3	23000	17	3	2	19 of 19
Unleaded petrol (minimum RON = 95) E5 (0)	5.5	2 041 371 000	1 534 090	347	599	19 of 19
Unleaded petrol (minimum RON ≥ 98) E5 (0)	4.9	89 732 000	67 290	23	31	19 of 19
Unleaded petrol (minimum RON ≥ 98) E+ (E85)	76.1	4 617 000	3 603	0	0	0 of 19
<b>Total Petrol</b>		<b>2 135 743 000</b>	<b>1 605 000</b>	<b>373</b>	<b>632</b>	<b>19 of 19</b>
Diesel fuel B7 (motorova nafta)	5.4	5 916 637 000	4 954 000	601	683	7 of 7
<b>Total Diesel</b>		<b>5 916 637 000</b>	<b>4 954 000</b>	<b>601</b>	<b>683</b>	<b>7 of 7</b>

### 2.6.4 Exceedances of the fuel quality limits

#### Petrol fuel grades

Table 2.6.3 summarizes the parameters for which exceedances were reported for the petrol fuel grades measured.

**Table 2.6.2 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
Research octane number	--	> 95	94.1	99.6	6	946
Motor octane number	--	> 85	84.2	88	6	946
Vapour pressure, DVPE	kPa	< 60	0	72.9	9	347
Aromatics	% V/V	< 35	20.5	36.7	2	946
Oxygen content	% (m/m)	< 3.7	0	3.42	2	599

## Diesel fuel grades

Table 2.6.3 summarizes the parameters for which exceedances were reported for the diesel fuel grades measured.

**Table 2.6.3 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	12	3	1284

## 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: Refuelling stations

### 2.7.2 Fuel quality monitoring service

#### Sampling

Sampling and analysis were carried out by an accredited laboratory for the Danish Petroleum Association (EOF). 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. Denmark is a small sized country, using statistical model C. Denmark is considered one region.

- 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 EOF, and these should meet the EOF 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.

### 2.7.3 Sales

**Table 2.7.1 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 (Oktan 92 unleaded)	5.0	139 853 200	104 890	50	49	19 of 19
Unleaded petrol (minimum RON = 95) E5 (Oktan 95 unleaded)	5.0	1 648 584 800	1 236 439	51	50	19 of 19
Unleaded petrol (minimum RON ≥ 98) E5 (Oktan 100 unleaded)	5.0	0	0	1	3	19 of 19
<b>Total Petrol</b>		<b>1 788 438 000</b>	<b>1 341 329</b>	<b>102</b>	<b>102</b>	
Diesel fuel B7 (Miljødiesel (<0,01 % S))	7.0	3 315 196 000	2 784 765	50	50	6 of 7
<b>Total Diesel</b>		<b>3 315 196 000</b>	<b>2 784 765</b>	<b>50</b>	<b>50</b>	

## 2.7.4 Exceedances of the fuel quality limits

### Petrol fuel grades

Table 2.7.2 and Table 2.7.3 summarize the parameters for which exceedances were reported for the petrol fuel grades measured.

**Table 2.7.2 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	66.9	83	14	52
Distillation – evaporated at 100 °C	% V/V	> 46	8.7	63.3	1	99
Aromatics	% V/V	< 35	27.6	36.7	5	99

**Table 2.7.3 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
Vapour pressure, DVPE	kPa	< 60	67.1	74.1	2	51
Olefins	% V/V	< 18.0	0	21.5	1	101
Aromatics	% V/V	< 35	30.8	36.7	7	101

### Diesel fuel grades

Table 2.7.4 summarizes the parameters for which exceedances were reported for the diesel fuel grades measured.

**Table 2.7.4 Diesel fuel B7 (Miljødiesel (sulphur < 0.01 %))**

Parameter	Unit	Limit value	Minimum value measured	Maximum value measured	Number of samples outside tolerance limit	Total number of samples
Density at 15 °C	kg/m <sup>3</sup>	< 845	832.8	846.4	1	100

## 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

Sampling is undertaken in accordance with Standard EN 14275 by the Estonian Environmental Research Centre, which is also responsible for analysis and reporting of results. Samples are taken only from retail fuel stations. Sampling points are selected so that most of the 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 is contracted privately to the Estonian Environmental Research Centre. When non-compliant samples occur, the public bodies responsible for taking action are the Estonian Environmental Inspectorate and the Estonian Tax and Customs Board. 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.

#### 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 2.8.1 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) E10	0.0	8 815 250	6 523	0	0	0 of 19
Unleaded petrol (minimum 95 ≤ RON < 98) E5 (RON95)	4.2	215 451 710	159 434	95	43	19 of 19
Unleaded petrol (minimum RON ≥ 98) E5 (RON98)	1.5	32 684 351	24 186	75	27	19 of 19
Total Petrol		256 951 311	190 144	170	70	
Diesel fuel B7 (Diesel B7)	2.0	804 517 091	672 247	120	50	7 of 7
Total Diesel		804 517 091	672 247	120	50	

### 2.8.4 Exceedances of the fuel quality limits

#### Petrol fuel grades

Table 2.8.2 and Table 2.8.3 summarize the parameters for which exceedances were reported for the petrol fuel grades measured.

**Table 2.8.2 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
Research octane number	--	> 95	91.3	96.9	1	138
Vapour pressure, DVPE	kPa	< 60	60.7	90.1	1	138

**Table 2.8.3 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	59.3	87	1	102



## 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:	Refuelling stations

### 2.9.2 Fuel quality monitoring service

#### Sampling

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. In case of non-compliant samples, the analyses will be repeated as soon as possible. If non-compliance is confirmed, the Customs contacts the fuel supplier/oil company to get a detailed account. If clear reason for non-compliance is not found, if there's no signs of intentional offending action, and the case is not a serious one, a written procedure is often considered appropriate and sufficient. When non-compliant samples are repeatedly found, remark or formal complaints may also be given. According to Paragraph 175 (Rectification of a violation or negligence) of the Environmental Protection Act 527/2014. A supervisory authority may prohibit a party from continuing or repeating a procedure violating existing regulations or order a party to fulfil its duty in some other way. Ministry of the Environment is informed about actions taken. If there is a risk that non-compliant fuel can cause damage to the vehicle (lead, sulphur) and the fuel is still on the market, it is possible to order the fuel supplier to remove the product from the market. According to Paragraph 183 (Decision to prohibit or require action on substances, preparations, products, equipment and machines) the Ministry of the Environment may prohibit the manufacturer, importer or other market supplier from continuing operations that are contradicting existing regulations by:

- prohibiting the trading, sale or other supply of products that are in violation of existing regulations;
- requiring 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.

#### Fuel quality monitoring system administration

The supervision of fuel quality 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.

Finland is a small sized country, using statistical model A. The country is divided into three macro-regions with similar sales volumes and variability factors.

## National legislation that transposed the Fuel Quality Directive

An 'arctic' derogation was granted in 2011. The summer period is from 1 June to 31 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 the Fuel Quality Vapour Pressure Derogation (original notification dated 17 February 2010, supplementary information 26 June 2010 and 6 September 2010).

### Reporting periods

Seasonal periods in Finland are as follows:

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

Finland 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 were taken during the transition period and test results were reported in the annual fuel quality report.

### 2.9.3 Sales

**Table 2.9.1 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 ( <i>Moottoribensiini 95 E10</i> )	10.0	1 316 567 000	987 425	51	51	19 of 19
Unleaded petrol (minimum RON ≥ 98) ( <i>Moottoribensiini 98 E5</i> )	5.0	589 571 000	442 179	51	47	19 of 19
Total petrol		1 906 138 000	1 429 604	102	98	
Diesel fuel B7 ( <i>Dieselöljy</i> )	7.0	3 124 122 000	2 639 883	51	52	6 of 7
Total diesel		3 124 122 000	2 639 883	51	52	

### 2.9.4 Exceedances of the fuel quality limits

#### Petrol fuel grades

Table 2.9.2 and Table 2.9.3 summarize the parameters for which exceedances were reported for the petrol fuel grades measured.

**Table 2.9.2 Unleaded petrol (minimum RON = 95) E10 (Moottoribensiini 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	63.6	74.4	1	42

**Table 2.9.3 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
Aromatics	% v/v	< 35	30.4	36.1	1	98
Oxygen content (petrol with 5% (v/v) or less ethanol content)	% m/m	< 2.7	2.4	3	1	98

### 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: Refuelling stations

### 2.10.2 Fuel 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 refuelling station control campaign is spread over a calendar year and is organized in quarterly programmes, 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 2.10.1 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	6 026 006 000	4 549 635	120	101	19 of 19
Unleaded petrol (minimum RON = 95) E10 (SP95-E10)	10.0	4 540 199 000	3 427 850	97	101	19 of 19
Unleaded petrol (minimum RON = 95) E+ (E85)	85.0	182 371 000	137 690	0	0	0 of 19
Total Petrol		10 748 576 000	8 115 175	217	202	
Diesel fuel B7 (B7)	8.0	40 036 173 000	33 830 566	121	101	7 of 7
Total Diesel		40 036 173 000	33 830 566	121	101	

### 2.10.4 Exceedances of the fuel quality limits

#### Petrol fuel grades

Table 2.10.2 and Table 2.10.3 summarize the parameters for which exceedances were reported for the petrol fuel grades measured.

**Table 2.10.2 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
Motor octane number	--	> 85	84.8	95.7	1	221
Vapour pressure, DVPE	kPa	< 60	54.2	63.1	2	120
Aromatics	% v/v	< 35	19.8	35.5	1	221
Oxygen content (petrol with 5 % (v/v) or less ethanol content)	% m/m	< 2.7	0.03	> 2.9	1	221

**Table 2.10.3 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	kPa	< 60	55.9	65.4	3	97
Oxygen content	% (m/m)	< 3.7	2.17	3.83	2	198

## Diesel fuel grades

Table 2.10.4 summarizes the parameters for which exceedances were reported for the diesel fuel grades measured.

**Table 2.10.4 Diesel fuel B7 (Gazole)**

Parameter	Unit	Limit value	Minimum value measured	Maximum value measured	Number of samples outside tolerance limit	Total number of samples
Cetane number	--	> 51	48.5	58.7	2	222
Distillation 95% Point	°C	< 360	339.2	362.1	2	222
Fatty acid methyl ester content	% v/v	< 7	3.8	8.2	5	222

## 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:	Refuelling 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 states (*Bundesländer*) or their federal state agencies. The results of the regional sampling are forwarded to the Umweltbundesamt (Federal Environment Agency — UBA), where data are collected and subsequently consolidated into a report.

Selection of the sampling points is the responsibility of each of the 16 federal states, and it differs from state to state. The quality of petrol and diesel fuels is tested by the competent authorities of the federal states. The method for selecting fuel stations may be rotation, random selection or another way, taking into account population distribution and regional aspects. The sampling was carried out only at refuelling stations.

## **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.

Germany is a large sized country regarding fuel sales, using statistical model B. Germany is divided into 16 political regions, which do not comply with fuel distribution patterns. The proportions sampled for the various regions and the resulting number of samples is stipulated in the General Administrative Regulation on the Tenth Federal Emission Control Act (10th BImSchV), Annex 20. The regions have to convey their results to the Federal Environment Agency by 30 April of the following year, where a general report is produced. The Federal Environment Agency passes this report on to the Federal Ministry for the Environment, Nature Conservation, Building 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 taking action 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.

## **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 (10th BImSchV).

## **Reporting periods**

Transition periods are from 1 October to 15 November and from 28 February/1 March to 14 April.

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 28/29 February.

For petrol, the transition period is from 1 October to 15 November and from 16 March to 30 April. For diesel, the transition period is from 1 October to 15 November and from 1 March to 14 April.

Samples may be taken during the whole year, preferably in the summer or winter period. A small number of samples has been taken during the transition period for all sort of fuels in their respective transition periods. Since the cold filter plugging point (CPFF) is not reported, none of the parameters reported for diesel should be influenced. For petrol the sample has been subsumed to the reporting period, for which the fuel has been laid out according to the measured parameters.

### 2.11.3 Sales

**Table 2.11.1 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	19 792 069 186	14 844 089	192	188	19 of 19
Unleaded petrol (minimum RON = 95) E10 (Super E10)	10.0	3 145 769 469	2 359 333	177	173	19 of 19
Unleaded petrol (minimum 95 ≤ RON < 98) E5 (Super Plus)	5.0	1 104 586 572	828 442	28	25	19 of 19
Total Petrol		24 042 425 227	18 031 864	397	386	
Diesel fuel B7 (Diesel)	7.0	44 646 707 123	37 503 429	223	226	6 of 7
Total Diesel		44 646 707 123	37 503 429	223	226	

### 2.11.4 Exceedances of the fuel quality limits

#### Petrol fuel grades

Table 2.11.2, Table 2.11.3 and Table 2.11.4 summarize the parameters for which exceedances were reported for the petrol fuel grades measured.

**Table 2.11.2 Unleaded petrol (minimum RON = 95) 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	55.3	64.6	1	192

**Table 2.11.3 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	< 60	51.5	62.6	1	177

**Table 2.11.4 Unleaded petrol (minimum 95 ≤ RON < 98) E5 (Super Plus)**

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	51.1	62.8	1	28

## Diesel fuel grades

No exceedances of the diesel fuel quality limits were reported.

### 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:	Refuelling stations

#### 2.12.2 Fuel quality monitoring service

##### Sampling

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

Based on the sales percentage of various grades of fuels in each region, the Directorate of Energy, Industrial and Chemical Products sets the minimum number of fuel samples to be taken from refuelling stations in the area. The Directorate of Energy, Industrial and Chemical Products has the option to 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 in order to prepare and submit the annual report to the European Commission.

##### Fuel quality monitoring system administration

Greece is classified as a small country, with regard to fuel sales levels. Statistical model A applies to Greece. Three macro-regions are defined.

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 taking into account 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). In Greece there are four refineries and approximately 7000 refuelling stations.

### National legislation that transposed the Fuel Quality Directive

Fuel Quality Directive 2009/30 (with the exception of 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 2.12.1 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) (95 RON)	0.0	2 886 554 075	2 157 699	50	50	10 of 19
Unleaded petrol (minimum 95 ≤ RON < 98) (LRP (96 RON))	0.0	542 423	405	4	4	10 of 19
Unleaded petrol (minimum RON ≥ 98) (super unleaded (100 RON))	0.0	178 794 144	133 649	3	3	9 of 19
Total Petrol		3 065 890 641	2 291 753	57	57	
Diesel fuel B7	7.0	3 142 634 292	2 616 243	50	50	4 of 7
Total Diesel		3 142 634 292	2 616 243	50	50	

### 2.12.4 Exceedances of the fuel quality limits

#### Petrol fuel grades

No exceedances of the petrol fuel quality limits were reported.

#### Diesel fuel grades

Table 2.12.2 summarizes the parameters for which exceedances were reported for the diesel fuel grades measured.

**Table 2.12.2 Diesel fuel B7**

Parameter	Unit	Limit value	Minimum value measured	Maximum value measured	Number of samples outside tolerance limit	Total number of samples
Fatty acid methyl ester content	% v/v	< 7	4	8.6	19	96

## 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:	Refuelling stations

### 2.13.2 Fuel quality monitoring service

#### Sampling

ÁMEI Testing and Certifying Co. operates sampling, testing and reporting activities in line with the EU Directives. Samples were taken by ÁMEI Zrt. at retail stations representatively selected based upon National Tax and Customs Administration (NAV) documents. Testing was completed in ÁMEI Zrt. accredited laboratories with reports compiled by the company's management.

#### Fuel quality monitoring system administration

Hungary's system is in line with system proposed by CEN standards.

The Ministry of Innovation and Technology is accountable for managing FQD. FQMS related sampling, testing and reporting are contracted to ÁMEI Co.

Hungary is a small sized country, using statistical model C to design and implement the monitoring system.

The country is defined as one macro-region with one oil refinery and several distribution terminals.

Test results, including non-compliance samples, are reported quarterly to the Ministry of Innovation and Technology with annual data set made available by 31st March of the consecutive year.

#### 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 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 2.13.1 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	1 865 800 000	1 391 514	50	50	19 of 19
Unleaded petrol (minimum RON ≥ 98) E5 (ESZ-98)	5.0	94 000 000	70 311	10	10	19 of 19
Total Petrol		1 959 800 000	1 461 825	60	60	
Diesel fuel B7 (Dízel gázolaj)	7.0	4 353 900 000	3 645 537	60	60	6 of 7
Total Diesel		4 353 900 000	3 645 537	60	60	

### 2.13.4 Exceedances of the fuel quality limits

#### Petrol fuel grades

Table 2.13.2 summarizes the parameters for which exceedances were reported for the petrol fuel grades measured.

**Table 2.13.2 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
Motor octane number	--	> 85	83.9	85.7	3	100

#### Diesel fuel grades

No exceedances of the diesel fuel quality limits were reported.

## 2.14 Iceland

### 2.14.1 Country details

Responsible organization: Environment Agency of Iceland

Country size: Small

Summer period: 1 June to 31 August

FQMS used: National system

Location of sampling: Terminals

### 2.14.2 Fuel quality monitoring service

#### Sampling

Fjölver surveyor and fuel inspection oversees the testing of each fuel batch delivery in Iceland.

#### Fuel quality monitoring system administration

In Iceland, each fuel batch delivery is controlled by Fjölver laboratory and fuel inspection. The testing results of the fuel products are directly compared with the agreed product requirements and are accepted if the results are within given specifications. The data of delivered fuel batches are reported to the competent authority; The Environment Agency of Iceland. Iceland is a small sized country, applying a national system. The whole country is defined as one region.

#### National legislation that transposed the Fuel Quality Directive

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

#### Reporting periods

Seasonal periods in Iceland are as follows:

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

Samples were taken and tested during the transition period. The results of samples taken during the transition period are reported.

### 2.14.3 Sales

**Table 2.14.1 Total sales and sample number**

Fuel grade (name)	Biofuel content (% v/v)	Total sales		Samples		Parameters measured
		Litres	Tonnes	Summer	Winter	
Unleaded petrol (minimum 95 ≤ RON < 98) E5 (Unleaded petrol (RON>95))	5.0	180 769 459	133 125	12	27	12 of 19
Total Petrol		180 769 459	133 125	12	27	
Diesel fuel (Diesel fuel B7)	0.0	279 689 377	234 207	12	27	5 of 7
Total Diesel		279 689 377	234 207	12	27	

### 2.14.4 Exceedances of the fuel quality limits

#### Petrol fuel grades

Table 2.14.2 summarizes the parameters for which exceedances were reported for the petrol fuel grades measured.

**Table 2.14.2 Unleaded petrol (minimum 95 ≤ RON < 98) E5 (Unleaded petrol (RON > 95))**

Parameter	Unit	Limit value	Minimum value measured	Maximum value measured	Number of samples outside tolerance limit	Total number of samples
Research octane number	--	> 95	93.7	99.8	1	39
Benzene	% v/v	< 1	0.83	1.03	1	39

## Diesel fuel grades

No exceedances of the diesel fuel quality limits were reported.

## 2.15 Ireland

### 2.15.1 Country details

Responsible organization: Department of Communications, Climate Action and Environment

Country size: Small

Summer period: 1 June to 31 August

FQMS used: EN 14274 statistical model C

Location of sampling: Refuelling stations

### 2.15.2 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 refuelling stations. Selection of sampling points is on a random basis and is carried out throughout the year.

#### 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. Annual data are 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 report and follow-up action is also reported. Ireland is a small country, using statistical model C. Whitegate Oil Refinery in County Cork is Ireland's only refinery. There are five distribution terminals in Ireland.

#### National legislation that transposed the Fuel Quality Directive

European Communities Act 1972 (Environmental Specifications for Petrol, Diesel Fuels and Gas Oils for use by non-road mobile machinery, including waterway vessels, agricultural and forestry tractors, and recreational craft) Regulations 2011 (SI No 155 of 2011).

## Reporting periods

Seasonal periods in Ireland are as follows:

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

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

### 2.15.3 Sales

**Table 2.15.1 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	1 417 810 513	1 050 230	50	50	18 of 19
Total petrol		1 417 810 513	1 050 230	50	50	
Diesel fuel B7	4.0	3 648 918 241	3 084 462	50	50	6 of 7
Total diesel		3 648 918 241	3 084 462	50	50	

### 2.15.4 Exceedances of the fuel quality limits

#### Petrol fuel grades

Table 2.15.2 summarizes the parameters for which exceedances were reported for the petrol fuel grades measured.

**Table 2.15.2 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
Vapour pressure, DVPE	kPa	< 60	66.6	73.9	1	50

#### Diesel fuel grades

No exceedances of the diesel fuel quality limits were reported.

## 2.16 Italy

### 2.16.1 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:	Refuelling stations

### 2.16.2 Fuel quality monitoring service

#### Sampling

A total of 200 petrol samples and 200 diesel fuel samples were analyzed. The distribution of samples throughout Italy was 25 % north-west, 22 % north-east, 25 % center, 18 % south and 10 % 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; in 2018 the sampling was carried out only at refuelling stations. Samples of petrol and diesel are taken by independent supervisory bodies.

#### Fuel quality monitoring system administration

The competent authority for the system of monitoring fuel quality is the Ministry of the Environment and Protection of Land and Sea. Italy is a large sized country regarding fuel sales, using statistical model A. Five macro-regions are defined, and samples are divided with respect to the population and number of filling stations.

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.

### 2.16.3 Sales

**Table 2.16.1 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 petrol)	5	8 101 434 398	6 100 365	100	100	19 of 19
Total Petrol		8 101 434 398	6 100 365	100	100	
Diesel fuel B7 (Diesel Fuel (10ppm sulphur))	7	31 494 517 174	26 222 335	100	100	6 of 7
Total Diesel		31 494 517 174	26 222 335	100	100	

### 2.16.4 Exceedances of the fuel quality limits

#### Petrol fuel grades

Table 2.16.2 summarizes the parameters for which exceedances were reported for the petrol fuel grades measured.

**Table 2.16.2 Unleaded petrol (minimum RON = 95) (Unleaded petrol)**

Parameter	Unit	Limit value	Minimum value measured	Maximum value measured	Number of samples outside tolerance limit	Total number of samples
Research octane number	--	> 95	92.2	99	3	200
Motor octane number	--	> 85	84.2	87.5	1	138
Vapour pressure, DVPE	kPa	< 60	0	61.9	1	46

#### Diesel fuel grades

Table 2.16.3 summarizes the parameters for which exceedances were reported for the diesel fuel grades measured.

**Table 2.16.3 Diesel fuel B7 (Diesel fuel (10 ppm sulphur))**

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	340.2	370	1	134
Sulphur content	mg/kg	< 10	3	19.7	1	200



## 2.17 Latvia

### 2.17.1 Country details

Responsible organization:	Ministry of Economics of the Republic of Latvia / State Revenue Service
Country size:	Small
Summer period:	1 June to 31 August
FQMS used:	National system
Location of sampling:	Refuelling stations and terminals

### 2.17.2 Fuel quality monitoring service

#### Sampling

The organizations responsible for sampling, analysis and reporting are the Ministry of Economics of the Republic of Latvia and the State Revenue Service. Samples have been taken from refuelling stations and terminals. The samples have been collected throughout the year.

#### 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 supervision of the fuel market in accordance with the 'Requirements for Conformity Assessment of Petrol and Diesel Fuel of Cabinet Regulation No 332. The State Revenue Service each year must submit FQM report to the Ministry of Economics by 1<sup>st</sup> of June. There are no oil refineries in Latvia and the fuels are imported. In 2017, there were 67 valid licenses for operations with petroleum products in tax warehouses, and two valid licenses for registered consignees of petroleum products. Latvia is small sized country, using a national system to monitor fuel quality.

#### National legislation that transposed the Fuel Quality Directive

Cabinet Regulation No 332, 'Requirements for Conformity Assessment of Petrol and Diesel Fuel', determines the technical specifications on health and environmental grounds for fuels placed on the Latvian market for use with positive ignition and compression-ignition engines of motor vehicles, non-road mobile machinery (including inland waterway vessels when not at sea), agricultural and forestry tractors, and recreational craft when not at sea, taking account of the technical requirements of those engines.

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 conformity assessment of biofuel and the transfer thereof for processing shall be carried out, the procedures by which the production of biofuel and blending thereof with fossil fuel shall be controlled, the procedures by which biofuel not conforming to quality requirements shall be destroyed and the procedures by which consumers shall be informed regarding the content of biofuel present at sale points and the conformity thereof with quality requirements.

Cabinet Regulation No 545, 'Regulation regarding the Sustainability Criteria for Biofuels and Bioliquids, the Mechanism for introducing thereof, and the Procedure by which they shall be supervised and monitored', prescribes the sustainability criteria for biofuels and bioliquids, the mechanism for introducing them and the procedure by which they shall be supervised and monitored.

## Reporting periods

Seasonal periods in Latvia are as follows:

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

A Vapour Pressure Waiver has been granted. There are no transition periods between summer- and winter-grade fuels and the samples have been taken in every month throughout the year.

### 2.17.3 Sales

**Table 2.17.1 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	216 086 275	165 306	4	8	12 of 19
Unleaded petrol (minimum RON ≥ 98) E5 (A-98)	0.0	23 549 020	18 015	1	2	12 of 19
Total Petrol		239 635 295	183 321	5	10	
Diesel fuel B7 (DD B7)	5.0	1 211 297 006	1 011 433	9	17	6 of 7
Total Diesel		1 211 297 006	1 011 433	9	17	

### 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

Table 2.17.2 **Error! Reference source not found.** summarizes the parameters for which exceedances were reported for the petrol fuel grades measured.

**Table 2.17.2 Diesel fuel B7 (DD 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	326	368.7	1	16

## 2.18 Lithuania

### 2.18.1 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:	Refuelling stations

### 2.18.2 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, 103 samples of petrol A-95 were taken at service stations.

#### Fuel quality monitoring system administration

The Ministry of Energy have responsibility for managing and implementing FQM Directive. Fuel sampling was carried out by The State Consumer Rights Protection Authority, which is responsible for taking action 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.

### 2.18.3 Sales

**Table 2.18.1 Total sales and sample number**

Fuel grade (name)	Biofuel content (% v/v)	Total sales		Samples		Parameters measured
		Litres	Tonnes	Summer	Winter	
Unleaded petrol (minimum RON = 95) E10 (A-95(RON 95))	10.0	304 000 903	228 609	50	50	19 of 19
Unleaded petrol (minimum RON ≥98) (A-98(RON 98))	0.0	9 693 058	7 289	0	3	19 of 19
Total Petrol		313 693 961	235 898	50	53	
Diesel fuel B+4 (>7% FAME ≤ 30% (Diesel))	>7	2 038 378 057	1 722 429	50	50	7 of 7
Total Diesel		2 038 378 057	1 722 429	50	50	

**Note:** FAME, fatty acid methyl ester.

### 2.18.4 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.

## 2.19 Luxembourg

### 2.19.1 Country details

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

### 2.19.2 Fuel quality monitoring service

#### Sampling

For 2017, the sampling, analysis and reporting of fuel quality was managed by three organizations. The samples were taken at depots and public refuelling stations. The sampling points were selected at random. Test methods are those specified in EN 228 and EN 590. The samples have to be taken in accordance with the methods described in the European standards:

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

## Fuel quality monitoring system administration

The FQMS is under the responsibility of the Environmental Administration, part of the Department of Environment of the Ministry of Sustainable Development and Infrastructures. Fuel sampling, analysis and reporting were each carried out by a contracted organization. Luxembourg is a small sized country, using a national system to monitor fuel quality. In 2009, the Environmental Administration developed, in collaboration with the Austrian Federal Environment Agency, a concept in order to improve, respectively to establish a national FQMS for Luxembourg.

In the case of a non-compliant sample, the agreed organization had 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 had to inform the Environmental Administration of the measures undertaken. A new sample then had to be taken within 3 working days following the written warning.

Luxembourg has no own refinery on its territory, therefore it's dependent from imports of petrol and diesel from other Member States, mainly from Belgium, the Netherlands and 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.

## Reporting periods

Seasonal periods in Luxembourg are as follows:

- summer: from 1 May to 15 September;
- winter: from 1 October to 15 April.

The transition periods are regulated by the Grand-ducal ordinance. During the transition period, no samples are taken or tested

### 2.19.3 Sales

**Table 2.19.1 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 (Euro 95)	5.0	331 751 280	245 496	34	31	19 of 19
Unleaded petrol (minimum RON >= 98) E5 (Euro 98)	5.0	92 163 021	68 201	31	31	19 of 19
Total Petrol		423 914 301	313 697	65	62	
Diesel fuel B7 (Diesel)	7.0	1 892 129 140	1 579 928	31	31	7 of 7
Total Diesel		1 892 129 140	1 579 928	31	31	

### 2.19.4 Exceedances of the fuel quality limits

#### Petrol fuel grades

Table 2.19.2 and Table 2.19.3 summarize the parameters for which exceedances were reported for the petrol fuel grades measured.

**Table 2.19.2 Unleaded petrol (minimum RON = 95) E5 (Euro 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	57	82.8	2	62
Manganese	mg/l	< 2	0.25	4.1	3	62

**Table 2.19.3 Unleaded petrol (minimum 95 ≤ 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	55.6	63.5	4	62
Manganese	mg/l	< 2	0.25	3.7	4	62

## Diesel fuel grades

Table 2.19.4 summarizes the parameters for which exceedances were reported for the diesel fuel grades measured.

**Table 2.19.4 Diesel fuel B7**

Parameter	Unit	Limit value	Minimum value measured	Maximum value measured	Number of samples outside tolerance limit	Total number of samples
Fatty acid methyl ester content	% v/v	< 7	1.7	7.1	1	62

## 2.20 Malta

### 2.20.1 Country details

Responsible organization: Regulator for Energy and Water Services

Country size: Small

Summer period: 1 May to 30 September

FQMS used: EN 14274 statistical model C

Location of sampling: Refuelling stations

### 2.20.2 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 104 diesel, 105 unleaded petrol minimum RON 95 and 5 unleaded petrol minimum RON 98, were taken and analyzed. 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 Greenhouse Gas 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.

### 2.20.3 Sales

**Table 2.20.1 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) (EN 228 minimum RON 95)	0.0	102 642 363	76 031	52	53	19 of 19
Unleaded petrol (minimum RON >= 98) (EN 228 minimum RON 98)	0.0	3 283 875	2 432	3	2	19 of 19
Total Petrol		105 926 238	78 463	55	55	
Diesel fuel B7 (EN 590)	≤ 7	170 207 230	143 635	52	52	6 of 7
Total Diesel		170 207 230	143 635	52	52	

### 2.20.4 Exceedances of the fuel quality limits

#### Petrol fuel grades

Table 2.20.2 summarizes the parameters for which exceedances were reported for the petrol fuel grades measured.

**Table 2.20.2 Unleaded petrol (minimum 95 ≤ RON < 98) E5 (EN 228)**

Parameter	Unit	Limit value	Minimum value measured	Maximum value measured	Number of samples outside tolerance limit	Total number of samples
Research octane number	--	> 95	94.5	97	1	105
Vapour pressure, DVPE	kPa	< 60	55	66.4	2	52

### Diesel fuel grades

Table 2.20.3 summarizes the parameters for which exceedances were reported for the diesel fuel grades measured.

**Table 2.20.3 Diesel fuel B7 (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	3.6	16	1	104

## 2.21 Netherlands

The Netherlands did not officially submit data, but the data left in draft mode in the Dutch data repository of the EEA from February 2020 has been taken into account.

### 2.21.1 Country details

Responsible organization: Human Environment and Transport Inspectorate

Country size: Small

Summer period: 1 May to 30 September

FQMS used: EN 14274 statistical model A

Location of sampling: Refuelling stations

### 2.21.2 Fuel quality monitoring service

#### Sampling

The samples were taken by inspectors of the Dutch inspectorate at fuel service stations. The laboratory of the Dutch customs is responsible for the analyses.

#### Fuel quality monitoring system administration

The Human Environment and Transport Inspectorate is responsible for this report. A total of 202 fuel samples, comprising of 100 diesel and 102 unleaded petrol were taken and analyzed. The Netherlands is a small sized country, using statistical model A.

#### National legislation that transposed the Fuel Quality Directive

The Dutch legislation transposed the Fuel Quality Directive under the Air Pollution Fuels Decree.



## Reporting periods

Seasonal periods in Netherlands 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. No samples were collected during the transition period.

### 2.21.3 Sales

**Table 2.20.1 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) (EN 228 minimum RON 95)	5.0	5 641 000 000	-	47	49	12 of 19
Unleaded petrol (minimum RON >= 98) (EN 228 minimum RON 98)	5.0	7 000 000	-	2	2	19 of 19
Total Petrol		5 648 000 000	-	49	51	
Diesel fuel B7 (EN 590)	7	7 948 000 000	-	49	51	6 of 7
Total Diesel		7 948 000 000	-	49	51	

### 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 Norway

### 2.22.1 Country details

Responsible organization: Norwegian Environment Agency

Country size: Small

Summer period: 1 June to 31 August

FQMS used: National System

Location of sampling: Refuelling stations

### 2.22.2 Fuel quality monitoring service

#### Sampling

In Norway the fuel quality monitoring system is based on data from the Certificates of Quality. SGS has been engaged to take physical samples at petrol stations and perform laboratory analysis. The samples were collected from different companies, making sure that samples were taken from all companies present on the market. Samples were collected according to EN 14274:2013. The organization responsible for reporting is the Norwegian Environment Agency. Fuel samples were randomly taken by inspectors at fuel service stations. In the summer period (July-August) the samples were taken in west of Norway (Rogaland, Hordaland and Sogn & Fjordane) and the in the winter period (November-December) the samples were taken in the north of Norway (Nordland, Troms and Finnmark).

#### Fuel quality monitoring system administration

The Norwegian Environment Agency is responsible for managing the FQM. The Ministry of Climate and Environment is responsible for implementing the directive. Fuel sampling is carried out by the laboratory SGS on behalf of the business sector. The Norwegian Environment Agency is responsible for audits and follow up if non-compliance is detected. Norway is a small sized country regarding fuel sales, using a national system to monitor fuel quality. There are no regional differences in fuel qualities on the market. There are 2 refineries and 17 distribution terminals.

#### National legislation that transposed the Fuel Quality Directive

Decision on air pollution.

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 September to 31 May.

There are no transitional periods.

### 2.22.3 Sales

**Table 6.21.1 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	5.0	1,069,400	N/A	20	20	18 of 19
Unleaded petrol (minimum 95 =< RON < 98) E5	0.0	22,300	N/A	0	0	0 of 19
Total petrol		1,091,700	N/A	20	20	
Diesel fuel B+ (>7% FAME ≤30%)	14.0	3,004,532	N/A	12	12	5 of 7
Total diesel		3,004,532	N/A	12	12	

#### 2.22.4 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.

### 2.23 Poland

#### 2.23.1 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:	Refuelling stations

#### 2.23.2 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 on the basis of statistical factors but also on the basis of 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.

#### 2.23.3 Sales

**Table 2.21.1 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	5 473 244 000	4 159 000	206	203	19 of 19
Unleaded petrol (minimum RON >= 98) E5 (RON98)	5.0	497 248 000	379 000	62	64	19 of 19
Total Petrol		5 970 492 000	4 538 000	268	267	
Diesel fuel B7 (ON)	7.0	20 568 340 000	17 212 000	206	206	7 of 7
Total Diesel		20 568 340 000	17 212 000	206	206	

#### 2.23.4 Exceedances of the fuel quality limits

##### Petrol fuel grades

Table 6.21.2 and Table 6.21.3 summarize the parameters for which exceedances were reported for the petrol fuel grades measured.

**Table 2.21.2 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
Research octane number	--	> 95	93.8	97	1	409
Motor octane number	--	> 85	84.4	86.6	1	409
Vapour pressure, DVPE	kPa	< 60	57.1	64.6	1	206

**Table 6.21.3 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	< 55	72.2	2	62
Aromatics	% v/v	< 35	< 23.2	37.2	6	115

## Diesel fuel grades

No exceedances of the diesel fuel quality limits were reported.

## 2.24 Portugal

### 2.24.1 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: Refuelling stations

### 2.24.2 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.

#### Fuel quality monitoring system administration

The body responsible for the FQMS is the Ministry of Environment and Energy Transition. 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.

### 2.24.3 Sales

**Table 2.22.1 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)	0.8	1 269 536 193	947 074	174	293	19 of 19
Unleaded petrol (minimum RON ≥ 98) E10 (Superplus)	0.8	106 328 912	80 172	12	43	19 of 19
Total petrol		1 375 865 105	1 027 246	186	336	
Diesel fuel B7 (Gasóleo)	6.9	5 350 730 952	4 494 614	190	345	6 of 7
Total diesel		5 350 730 952	4 494 614	190	345	

### 2.24.4 Exceedances of the fuel quality limits

#### Petrol fuel grades

Table 2.22.2 and Table 2.22.3 summarize the parameters for which exceedances were reported for the petrol fuel grades measured.

**Table 2.22.2 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
Research octane number	-	> 95	91	97.5	21	467
Motor octane number	-	> 85	81.7	86.9	26	467
Vapour pressure, DVPE	kPa	< 60	49.1	63.3	3	174
Aromatics	% v/v	< 35	23.8	36.4	1	467
Oxygen content (petrol with 5 % (v/v) or less ethanol content)	% (m/m)	< 2.7	0.37	2.97	1	467

**Table 2.22.3 Unleaded petrol (minimum RON  $\geq$  98) E10 (Superplus)**

Parameter	Unit	Limit value	Minimum value measured	Maximum value measured	Number of samples outside tolerance limit	Total number of samples
Research octane number	--	> 95	96.60	99.10	2	55
Motor octane number	--	> 85	85.40	88.00	4	55
Vapour pressure, DVPE	kPa	< 60	50.10	64.60	2	12

### Diesel fuel grades

Table 2.22.4 summarizes the parameters for which exceedances were reported for the diesel fuel grades measured.

**Table 2.22.4 Diesel fuel B7 (Gasóleo)**

Parameter	Unit	Limit value	Minimum value measured	Maximum value measured	Number of samples outside tolerance limit	Total number of samples
Sulphur content	mg/kg	< 10	5	37.9	5	535

## 2.25 Romania

### 2.25.1 Country details

Responsible organisation: Ministry of Energy of Romania

Country size: Small

Summer period: 1 May to 30 September

FQMS used: EN 14274 Statistical Model A

Location of sampling: Refuelling stations

### 2.25.2 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 are responsible for sampling, analysis, and reporting.

Samples are taken in refuelling stations and, from 2019, in terminals/depots. Sampling is planned to be performed twice each year, and from 2020, samples will be collected throughout all months from 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 Decision no. 80/2018 and 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 Decision no. 80/2018 and Law no. 311/2018, with the additional specifications of Order of the Ministry of Energy nr. 569/2019.

### Reporting periods

Seasonal periods in Poland are as follows:

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

No samples were taken during the transition periods.

### 2.25.3 Sales

**Table 2.24.1 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 (Benzina COR 95 E5)	4.5	874,401,895	973,659	100	0	17 of 19
Unleaded petrol (minimum 95 =< RON < 98) E5 (Benzina COR 98 E5)	4.5	75,246,797	697,659	8	0	17 of 19
Total Petrol		949,648,692	1,671,318	108	0	
Diesel fuel B7 (Motorina B5)	5.8	2,640,976,514	3,143,671	108	108	6 of 7
Total Diesel		2,640,976,514	3,143,671	108	108	

### 2.25.4 Exceedances of the fuel quality limits

#### Petrol fuel grades

Table 6.24.2 summarizes the parameters for which exceedances were reported for the petrol fuel grades measured.

**Table 6.24.2 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
Distillation evaporated at 100oC	% v/v	> 46	5.8	12.5	1	8
Distillation evaporated at 150oC	% v/v	> 75	33.7	35	1	8
Benzene	% v/v	< 1	1.07	2.45	1	8



## ***Diesel fuel grades***

No exceedances of the diesel fuel quality limits were reported.

### 2.26 Slovakia

#### 2.26.1 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:	Refuelling stations

#### 2.26.2 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](http://www.snas.sk)). Fuel sampling was carried out at refuelling stations only. Fuel sampling was carried out during both summer and winter periods, and the sampling locations were selected from a database of refuelling stations and on the basis of suggestions made by the Slovak Environmental Inspectorate (SIE). 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. Slovakia is a small sized country, using statistical model C, and is defined as one region under this model. When non-compliant samples were discovered, S.I.E was responsible for taking action 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.

### 2.26.3 Sales

**Table 2.23.1 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)	5.2	727 080 543	545 601	100	74	19 of 19
Unleaded petrol (minimum RON ≥ 98) E5 (Super Plus 98)	0.0	12 574 129	9 448	19	14	19 of 19
Total petrol		739 654 672	555 049	119	88	
Diesel fuel B7 (Diesel)	9.8	2 388 103 490	2 004 574	106	80	6 of 7
Total diesel		2 388 103 490	2 004 574	106	80	

### 2.26.4 Exceedances of the fuel quality limits

#### Petrol fuel grades

Table 2.23.2 and Table 2.23.3 summarize the parameters for which exceedances were reported for the petrol fuel grades measured.

**Table 2.23.2 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
Research octane number	--	> 95	94.4	98.2	1	174
Motor octane number	--	> 85	84	86.6	3	174
Vapour pressure, DVPE	kPa	< 60	54.2	65.6	4	100

**Table 2.23.3 Unleaded petrol (minimum RON ≥ 98) E5 (Super Plus 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	35.7	3	33

## Diesel fuel grades

Table 2.23.4 summarizes the parameters for which exceedances were reported for the diesel fuel grades measured.

**Table 2.23.4 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	42.5	58.8	23	186
Density at 15 °C	kg/m <sup>3</sup>	< 845	811.3	846	1	186
Sulphur content	mg/kg	< 10	1.71	10.3	6	186
Fatty acid methyl ester content	% v/v	< 7	0	9.8	1	186

## 2.27 Slovenia

### 2.27.1 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: Refuelling stations

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

#### Fuel quality monitoring system administration

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

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

## National legislation that transposed the Fuel Quality Directive

The FQD was transposed into national law by the Environmental Protection Act and the following regulations: (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.

### 2.27.3 Sales

**Table 2.24.1 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) (NBM 95)	5.0	644 783 049	486 809	45	66	19 of 19
Unleaded petrol (minimum RON ≥ 98) (NBM 98/100)	5.0	44 191 000	33 364	7	9	19 of 19
Total petrol		688 974 049	520 173	52	75	
Diesel fuel B7 (B7)	7.0	2 018 220 687	1 704 930	63	99	6 of 7
Total diesel		2 018 220 687	1 704 930	63	99	

### 2.27.4 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.

## 2.28 Spain

### 2.28.1 Country details

Responsible organization:	Ministerio para la Transición Ecológica
Country size:	Large
Summer period:	1 May to 30 September
FQMS used:	EN 14274 statistical model A
Location of sampling:	Refuelling stations and terminals

### 2.28.2 Fuel quality monitoring service

#### Sampling

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

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

#### 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. The country is divided into regions considering the refineries and the terminals. There are nine refineries in the country. 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. 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.

### 2.28.3 Sales

**Table 2.25.1 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)	4.7	6 244 964 747	4 696 213	100	100	19 of 19
Unleaded petrol (minimum RON ≥ 98) E5 (Gasolina 98)	5.7	520 496 795	391 414	100	100	19 of 19
Total petrol		6 765 461 543	5 087 627	200	200	19 of 19
Diesel fuel B7 (Gasóleo A)	5.5	27 779 238 544	23 473 457	100	100	7 of 7
Total diesel		27 779 238 544	23 473 457	100	100	7 of 7

### 2.28.4 Exceedances of the fuel quality limits

#### Petrol fuel grades

Table 2.25.2 and Table 2.25.3 summarize the parameters for which exceedances were reported for the petrol fuel grades measured.

**Table 2.25.2 Unleaded petrol (minimum RON = 95) E5 (Gasolina 95)**

Parameter	Unit	Limit value	Minimum value measured	Maximum value measured	Number of samples outside tolerance limit	Total number of samples
Vapour pressure, DVPE	kPa	< 60	52.2	77.2	3	166
Benzene	% v/v	< 1	0.43	1.1	1	180
Oxygen content (petrol with 5 % (v/v) or less ethanol content)	% (m/m)	< 2.7	0.84	3.3	3	180

**Table 2.25.3 Unleaded petrol (minimum RON ≥ 98) (Gasolina98)**

Parameter	Unit	Limit value	Minimum value measured	Maximum value measured	Number of samples outside tolerance limit	Total number of samples
Aromatics	% v/v	< 35	18.9	36.3	1	180
Oxygen content (petrol with 5 % (v/v) or less ethanol content)	% (m/m)	< 2.7	1.51	3.1	7	180

#### Diesel fuel grades

Table 2.25.4 summarizes the parameters for which exceedances were reported for the diesel fuel grades measured.

**Table 2.25.4 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	3.7	12.4	1	196
Fatty acid methyl ester content	% v/v	< 7	0.2	8	2	142

## 2.29 Sweden

### 2.29.1 Country details

Responsible organization:	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

### 2.29.2 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 2018 there were 702 samples of Unleaded Petrol 95, 74 samples of Unleaded Petrol 98 and 912 samples of diesel taken at the terminals. There are three national refineries in Sweden producing automotive fuels and 32 distribution 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 2018 (representing Summer quality), The Swedish Transport Agency, as an assessment of the national monitoring system's equivalency to the CEN system (crosschecking), carried out sampling at actual refuelling stations 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); Luleå, Sundsvall, Västerås, Göteborg and Trelleborg. The refuelling stations also represented five different fuel companies. The samples where then analysed 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 refuelling stations (crosschecking) showed good equivalency for both petrol and diesel with this report based upon quality data of the deliveries to the terminals. The analysis report for the crosschecking at refuelling stations in 2018 is available from The Swedish Transport Agency upon request. The same goes for the analysis reports from 2012-2017. The Swedish Transport Agency plans to do a similar crosschecking at actual refuelling stations in the summer of 2019 to also verify the upcoming 2020 FQMS Report.

## Fuel quality monitoring system administration

The Swedish Transport Agency verified the reliability of the Swedish Petroleum and Biofuels Institute's compilation of quality data at the terminals for this 2018 fuel quality report. The data from the terminals showed good conformity with the samples from the actual refuelling stations in 2018 representing summer quality, for both petrol and diesel.

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 is also according to an agreement between the European Commission, Directorate-General Climate Action and the Swedish Ministry of the Environment and Energy, in October 2014, by reason of (EU-pilot 6321/14/CLIM).

## 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 fatty acid methyl ester (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 (benzine) 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.



### 2.29.3 Sales

**Table 2.26.1 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	2 910 091 271	2 182 568	345	357	13 of 19
Unleaded petrol (minimum RON ≥ 98) E5 (Blyfri 98 MK1)	5.0	99 310 250	74 483	63	11	13 of 19
Total petrol		3 009 401 521	2 257 051	408	368	
Diesel fuel B7 (Diesel MK1)	7.0	5 756 501 948	4 685 793	474	438	6 of 7
Total diesel		5 756 501 948	4 685 793	474	438	

### 2.29.4 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.

## 2.30 United Kingdom

### 2.30.1 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 and refuelling stations

### 2.30.2 Fuel quality monitoring service

#### Sampling

Sampling is done at refineries, terminals and refuelling stations. Samples are done routinely throughout the year and across all regions of the UK. 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. Super unleaded petrol is only just short of this but sells in smaller volumes, therefore more than adequate. The addition of the sample results from refineries and terminals adds over 3000 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 is a large sized country with regard to fuel sales, and it uses a national system to monitor fuel quality. 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 a number of years and takes into account a very large number of samples from across the year and across the UK to provide, with a suitable degree of confidence, a view 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 April.

The United Kingdom has been granted a Vapour Pressure Waiver in petrol during the summer period. The transition period is the month of May. Vapour pressure samples are taken during the transitional period but are excluded from the fuel quality report because they are transitional.

### 2.30.3 Sales

**Table 2.27.1 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	14 810 517 890	10 810 597	374	632	19 of 19
Unleaded petrol (minimum 95 ≤ RON < 98) E5 (Super 97+RON)	5.0	1 054 037 682	775 598	78	128	19 of 19
Total petrol		15 864 555 572	11 586 195	452	760	
Diesel fuel B7 (Diesel)	7.0	29 383 642 492	24 630 044	1578	1342	7 of 7
Total diesel		29 383 642 492	24 630 044	1578	1342	

### 2.30.4 Exceedances of the fuel quality limits

#### Petrol fuel grades

Table 2.27.2 and

Table 2.27.3 summarize the parameters for which exceedances were reported for the petrol fuel grades measured.

**Table 2.27.2 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	< 60	58	72.3	3	372
Aromatics	% v/v	< 35	17.2	36.6	2	985

**Table 2.27.3 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	< 60	57.9	74.2	3	75
Aromatics	% v/v	< 35	23.1	36.5	8	182

### Diesel fuel grades

Table 2.27.4 summarizes the parameters for which exceedances were reported for the diesel fuel grades measured.

**Table 2.27.4 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	12	2	2906
Fatty acid methyl ester content	% v/v	< 7	0	7.7	2	2263



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