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EU Fuel Quality Monitoring – 2001 Summary Report

Final report produced for the European Commission, DG Environment

Nikolas Hill

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1 Introduction

This report produced for DG Environment represents a consolidation of Member States' submissions, summarising the quality of petrol and diesel in the community for the year 2001. The environmental specifications for petrol and diesel sold in the European Community are included in Directive 98/70/EC. Two sets of fuel specifications are included in the Directive, the first entered into force on 1 January 2000 and the second will enter into force on 1 January 2005. The Directive also stipulates that Member States are required to report summaries of the quality of fuels sold in their territories. The reporting format for this was laid out in Commission Decision of 18/02/2002, 2002/159/EC (Appendix 1). Member States were required under the Directive to report for the first time by 30 June 2002 for the preceding calendar year (i.e. 2001).

The content of this report has been presented, discussed and validated at an expert meeting held on 3rd May 2003, with stakeholders including Member State and EU candidate country representatives, the auto industry and the oil industry.

1.1 REPORT STRUCTURE

The report begins by setting out the background and context for the control of fuel quality and its relation to harmful tailpipe emissions from vehicles. Subsequent sections (2 to 16) summarise the information reported by individual Member States under Commission Decision 2002/159/EC, as part of their submissions of summaries of national fuel quality data. The final sections (17 and 18) provide an EU summary, discussion of the 2001 reporting and recommendations for future reporting.

1.2 CONTEXT

Reduction of fuel consumption and associated greenhouse gas and other emissions has become a higher priority for governments, the public, vehicle manufacturers and the fuel industry alike as concerns over air quality and global warming grow. At present, transport is a significant contributor to CO_2 as well as other emissions and the demand for transport is rising. By far the largest single portion of transport emissions derive from passenger cars, which account for around half of the total transport CO_2 emissions in the European Union. Fuel quality has strong links to both CO_2 and air quality related emissions; the following sections briefly outline the main policy drivers relating to fuel consumption, carbon dioxide emissions, air quality and their influence on fuel quality legislation.

1.2.1 Fuel Consumption & Carbon Dioxide Emissions

The Community's strategy to reduce carbon dioxide emissions from passenger cars and improve fuel economy was endorsed by the Council in 1996 (COM(95) 689 final). This strategy presented an action plan to reduce CO_2 emissions over a fifteen-year period and thereby help the European Union meet the commitment it was expecting to make under the

Kyoto Convention. The strategy aims to deliver an average CO_2 emission value for new passenger cars equal to 120 g CO_2/km by 2005 or 2010 at the latest.

The automobile industry has committed itself to improving the fuel economy of vehicles produced such that it aims to deliver an average CO_2 emission figure for new passenger cars sold in the EU of 140 g CO_2/km by 2008/2009. In addition, in 2003 this is to be reviewed in consideration with the potential for additional CO_2 reduction, with a view to moving further towards the Community's objective of 120g CO_2 /km by 2012.

The automobile industry has attached a great importance to the availability of low sulphur (<50 ppm) and sulphur-free (<10 ppm) fuel to meet both the mandatory emission limits for nitrogen oxides (and diesel particulates) and the targets for reduced CO_2 emissions. Sulphur-free fuels enable the use of improved catalytic technology and reduce particle emissions, facilitating compliance with existing (and future) emissions standards and help improve fuel efficiency.

1.2.2 Air Quality

The framework for the assessment and management of air quality is described in Directive 96/62/EC and the limit values for the air pollutants nitrogen dioxide, sulphur dioxide, lead and particulate matter are set out in the first daughter Directive 99/30/EC. The limit values for nitrogen dioxide are to be attained by 2010 and those for particulate matter by 2005. There are also indicative values for particles for the year 2010.

Releases of carbon monoxide, hydrocarbons, nitrogen oxides and particulates from vehicles are covered under the Euro standards. These are all measured separately for petrol and diesel cars as well as light and heavy goods vehicle classes, and contain maximum permitted mean emissions. There are four stages for cars and LCVs (Light Commercial Vehicles) and five (plus EEV) for HDVs (Heavy Duty Vehicles), which have progressively tighter emissions limits. Progress is also being made on an Environmentally Enhanced Vehicle (EEV) classification for light duty vehicles.

1.2.3 Fuel Quality

The parameters covered in the fuel quality standards outlined in Directive 98/70/EC fall loosely into two categories. Firstly, physical properties (such as RON for petrol; Cetane number & density for diesel) need to be within certain limits in order for internal combustion engines to function efficiently (which itself has an impact on emissions of both air quality pollutants and CO_2). Secondly, fuel content that may be more directly linked to harmful emissions (such as hydrocarbons, sulphur and lead content). The standards are listed within Commission Decision 2002/159/EC found in Appendix 1 of this report.

A general ban on the marketing of leaded petrol was agreed by EU institutions from 2000. Sulphur is of particular interest as its presence in fuels can harm the effectiveness of several existing and emerging automotive technologies such as three-way catalytic converters, oxidation catalysts, NOx Storage Traps (NSTs) and particulate traps. The current mandatory limit for sulphur is set at 150 ppm, however some EU states are already providing fuel at <50 ppm ahead of the future date of its mandatory requirement of 2005. Debate as to whether the 2005 limit should be reduced further prompted the EC to launch a consultation with

stakeholders in 2000[1]. The final decision to amend Directive 98/70/EC (made in December 2002) is that the 2005 limit of 50 ppm will stand, but that zero sulphur fuel should be made available "on an appropriately balanced geographical basis" from January 2005 and made mandatory from 2009.

The reasoning behind this amendment is that by 2009 the composition of vehicle fleets able to take full advantage of the lower sulphur content will be sufficient to more than offset any disadvantages due to additional refining of the fuel. The availability of zero sulphur petrol (<10 ppm) would lead to an improvement in the fuel economy of future gasoline direct injection cars by 1-5% compared to similar vehicles using fuel containing a maximum of 50 ppm sulphur. It would also lead to lower emissions of conventional pollutants from the existing fleet of petrol vehicles.

With regard to heavy duty vehicles, exhaust after-treatment devices will perform better and be more durable with zero sulphur diesel. The fuel economy of other diesel vehicle types and technologies would also improve by using zero sulphur fuels and its use by the existing fleet could also lead to lower emissions of pollutants such as particulate matter.

[1] The results of this consultation may be found on in the following report available on DG Environment's website: 'Consultation on the Need to Reduce the Sulphur Content of Petrol and Diesel Fuels Below 50 ppm: - A Policy Maker's Summary'. A report produced for the European Commission, DG Environment; George Marsh, Nikolas Hill and Jessica Sully, November 2000; AEA Technology Environment, UK.

2 Austria

2.1 FUEL AVAILABILITY 2001

The following table lists the fuels that were reported to be available nationally in 2001, whether full sales data was provided and the category (the reference number) under which sampling measurements were reported.

Ref. No.	Fuel grade	Sulphur Content	National fuel grade	Sales Data Availability	Reporting Category
1	Petrol min. RON = 91	Normal	Normalbenzin	Yes	1
8	Petrol 95 = < RON < 98	< 50 ppm	Eurosuper	Yes	8
12	Petrol RON > = 98	< 10 ppm	Super Plus	Yes	12
13	Diesel Fuel	Regular	Diesel	Yes	13

2.1.1 Sales

Figure 2.1: National Fuel sales proportions by fuel type (%)

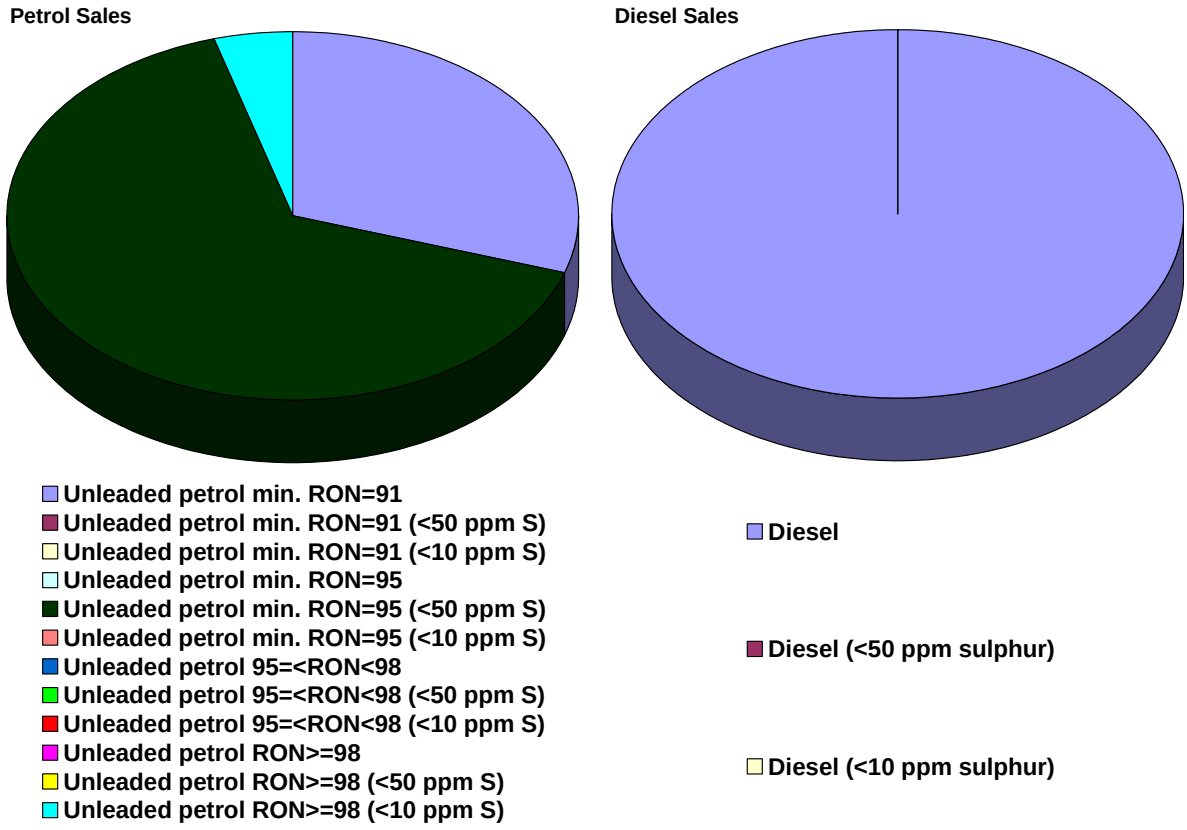


Figure 2.1 clearly shows that RON91 petrol was still sold widely in Austria in 2001, accounting for 30% sales, however low sulphur (<50 ppm) RON95-98 petrol presently accounted for 65% of sales. Sulphur free (<10 ppm) petrol was also available at RON>98 level throughout Austria, accounting for 5% of sales. No low sulphur diesel grades were available in Austria in 2001.

2.1.2 Sulphur content

Geographic availability of sulphur-free fuels: sulphur free unleaded petrol at RON 98 quality was available all over Austria, sulphur free Diesel was not available in 2001.

Average sulphur content of all petrol sold: 21 ppm

Average sulphur content of all diesel sold: 277 ppm

[Average sulphur content is calculated from the mean sulphur content from reporting on the sampled fuels, weighted to the quantities of different petrol or diesel fuel grades sold].

2.2 FUEL QUALITY MONITORING 2001

2.2.1 Description of system

Responsible organisation(s): Umweltbundesamt GmbH

Location(s) of sampling: The Federal area was split into four regions for which sampling was carried out. The type of sampling location (e.g. refuelling station or refinery) was not specified.

Time/frequency of sampling: a region was tested every quarter.

Number of samples taken: in each region 10 samples of each petrol type and 30 samples of diesel were taking each year.

Specification of test methods: not specified, assumed to comply with Directive 98/70/EC

Collection of sales data: method/source not specified.

Other details: the Fuel quality monitoring system was currently undergoing revision. The 2001 testing in Austria was organised by the industry itself and public authorities were not involved. Therefore no legal measures would be taken on exceedances.

2.2.2 Petrol reporting

Sampling

Summer Period:	Normal: 1st May to 30th September
Number of samples:	Summer: 60; Winter: 60
Frequency of sampling:	Quarterly (month not specified)

Reporting

Fuel grades:	The results of sample analysis of the 3 Petrol grades are reported in separate tables
Parameters:	All specified parameters are measured except: olefins, aromatics, all oxygenates, lead content. Leaded gasoline has been forbidden in Austria since 1993. Random testing of lead content was carried out until 1998, whereupon it was ceased as samples always complied with the regulations.

Other: From 2003 the Fuel Quality Monitoring System in Austria will be executed by the Federal Environment Agency conforming to the Directive 98/70/EC.

Exceedances of Directive 98/70/EC limit values

1. Super Plus Petrol

Detail: Summer vapour pressure limit (60 kPa) exceeded by 1.3 kPa on average in all samples. Individual values of exceedances were not supplied.

Statistical significance: The tolerance limit for statistical significance for the vapour pressure test method is 62.9 kPa, therefore it is currently not clear whether there is a non-compliance with the Directive.

Member State's notes: The tolerance limit is 1.8 kPa (above the limit), however in five of the 20 tests this limit was also exceeded. See also 2.2.1 other details.

2.2.3 Diesel reporting

Sampling

Number of samples: Summer: 60; Winter: 60

Frequency of sampling: Quarterly (month not specified)

Reporting

Fuel grades: Sampling analysis data has been provided for the single grade available.

Parameters: All parameters specified in the Directive are measured.

Other: No further comments.

Exceedances of Directive 98/70/EC limit values

1. Diesel

Detail: Limits for Cetane number (min. 51) and distillation-95% point (max. 360 C) have been exceeded by individual samples (50.9 and 366 respectively).

Statistical significance: The tolerance limits for statistical significance for Cetane number is 48.4, therefore this sample cannot be said to be noncompliant.

Insufficient information was provided to allow assessment of exceedances in comparison with distillation tolerance limits.

Member State's notes: See 2.2.1 other details.

2.3 TEMPORAL TRENDS

The following Figures 2.2 to 2.4 show the 5 year trend in Fuel Quality Monitoring reporting in terms of total fuel sales and low sulphur fuel sales as a proportion of total sales. Because this was the first year of reporting, there were no particular comments to be made.

Figure 2.2: Temporal Trends in National Sales of Petrol and Diesel (million litres)

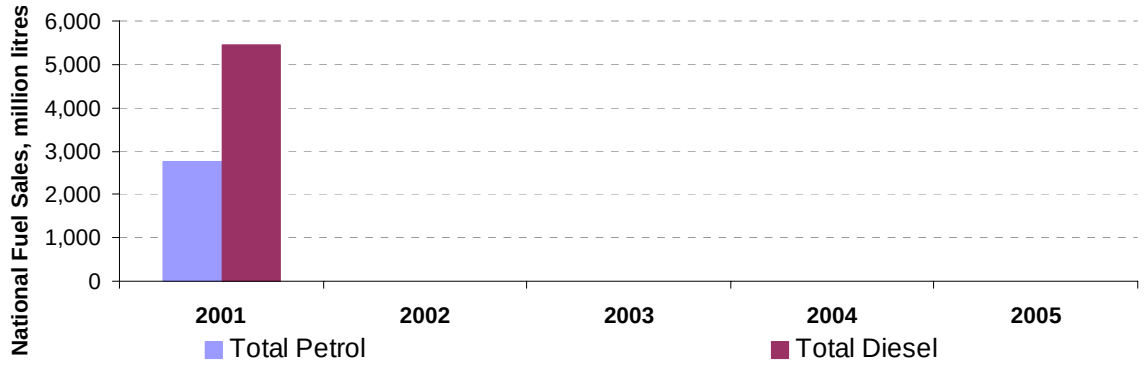


Figure 2.3: Temporal Trends in National Sales Proportions of Low Sulphur Petrol (%)

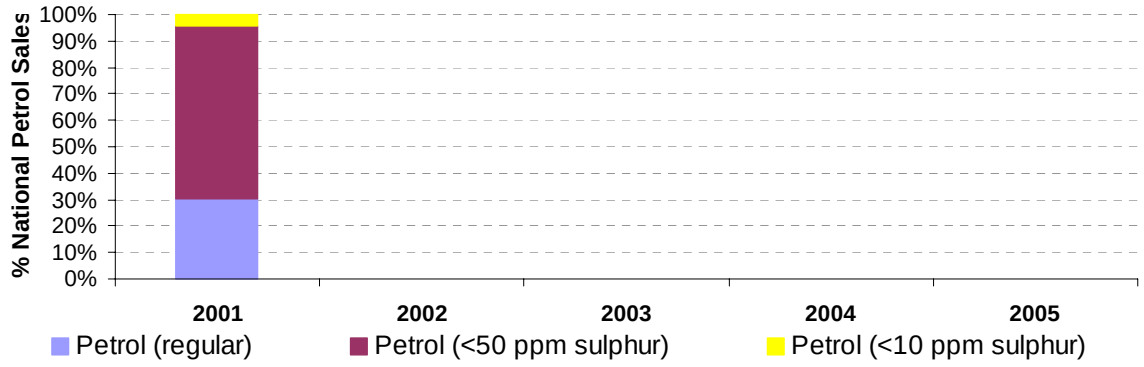
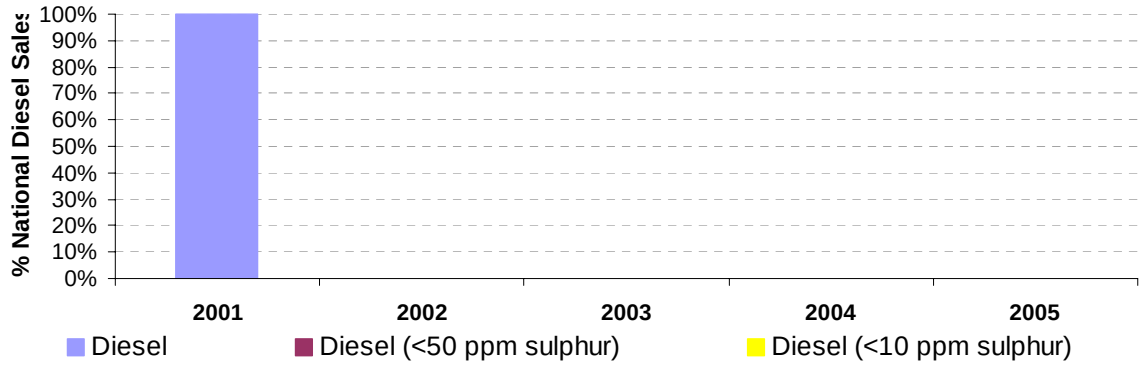


Figure 2.4: Temporal Trends in National Sales Proportions of Low Sulphur Diesel (%)



3 Belgium

3.1 FUEL AVAILABILITY 2001

The following table lists the fuels that were reported to be available nationally in 2001, whether full sales data was provided and the category (the reference number) under which sampling measurements were reported.

Ref. No.	Fuel grade	Sulphur Content	National fuel grade	Sales Data Availability	Reporting Category
4	Petrol min. RON = 95	Regular	-	Yes	4
7	Petrol 95 = < RON < 98	Regular	-	Yes	4
13	Diesel Fuel	Regular	-	Yes	13

3.1.1 Sales

Figure 3.1: National Fuel sales proportions by fuel type (%)

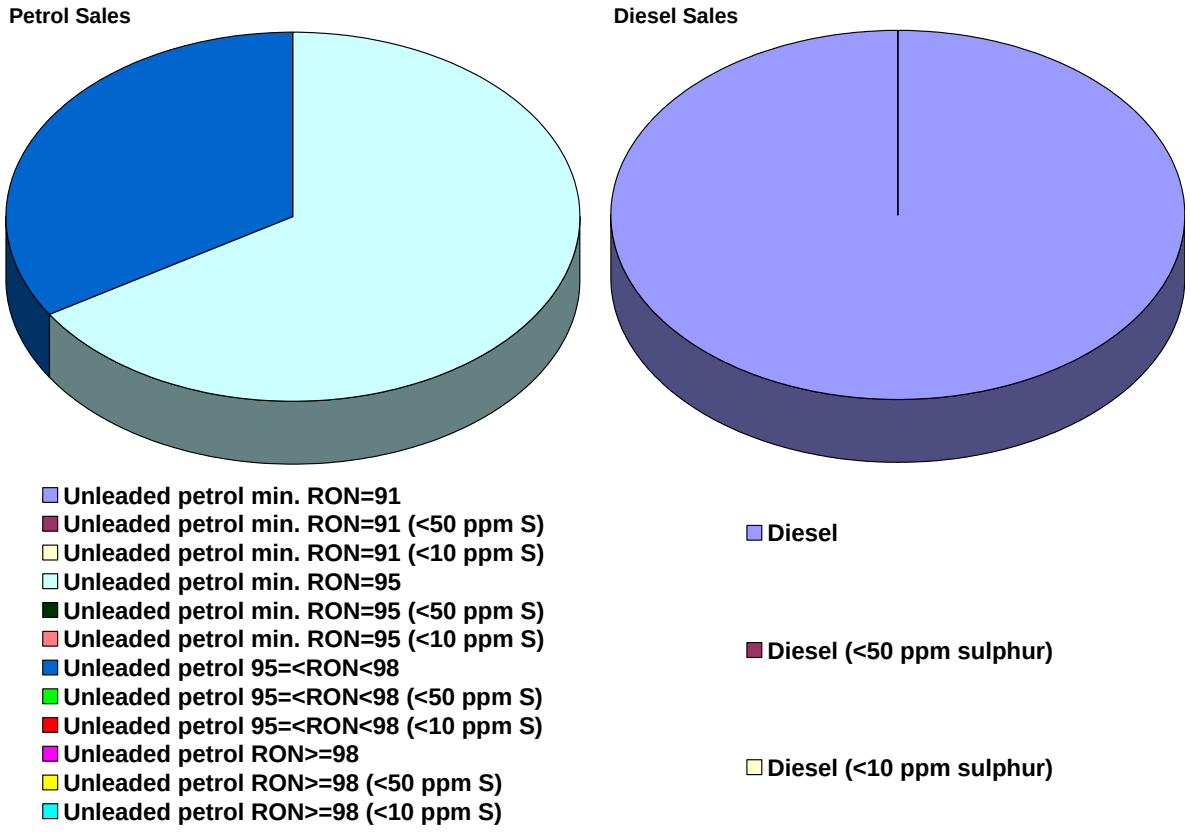


Figure 3.1 above shows that the majority (66%) of petrol sold in Belgium in 2001was RON95, with the remainder being sales of RON 95-98 fuel. No specifically low sulphur grades of petrol or diesel were available in 2001.

3.1.2 Sulphur content

Geographic availability of sulphur-free fuels: not available in 2001.

Average sulphur content of all petrol sold: 68 ppm

Average sulphur content of all diesel sold: 269 ppm

[Average sulphur content is calculated from the mean sulphur content from reporting on the sampled fuels, weighted to the quantities of different petrol or diesel fuel grades sold].

3.2 FUEL QUALITY MONITORING 2001

3.2.1 Description of system

Responsible organisation(s): FAPETRO (on behalf of the Ministry of Economic Affairs).

Location(s) of sampling: refuelling stations spread in the Belgium territory.

Time/frequency of sampling: monthly.

Number of samples taken: 2121 on all petrol fuels, and 5922 on diesel fuel spread fairly evenly across the year.

Specification of test methods: mostly in line with those specified in the Directive, with the exception of the distillation parameter for Petrol. In this case most laboratories still applied EN 228 standard in its 1993 version.

Collection of sales data: method/source not specified.

Other details: an electronic version of these reports is available via Internet on the site: http://mineco.fgov.be/energy/index_fr.htm

The incomplete reporting difficulties will be resolved by 2002. Belgium's monitoring system was introduced in 1996 and this monitoring system allows them to detect fraud for individual products. The mechanism was implemented systematically, with 11,500 samples taken in 2001. Two difficulties surfaced: high S content for petrol and diesel. This was due to transport-induced contamination, where tankers used for heating oil were used for transport fuels later. This will be resolved in future by monitoring bulk transport more thoroughly. Vapour pressure for petrol was also a problem because winter specification fuels were being supplied during the summer period – this has recently been resolved by new rules implemented in March 2002. The problem is mainly for lead substitute fuel, where there is a low turnover and so some fuel is still left in the summer.

3.2.2 Petrol reporting

Sampling

Summer Period: Normal: 1st May to 30th September

Number of samples: 2121

Frequency of sampling: Monthly, evenly spread throughout the year

Reporting

Fuel grades:	The results of sample analysis for both Petrol grades were presented in a single reporting table.
Parameters:	Parameters not analysed included: distillation - evaporation at 150 C; olefins, aromatics, all oxygenates.
Other:	Results for lead were all presented as < 5 mg/l

Exceedances of Directive 98/70/EC limit values

1. Petrol

Detail:	Some samples exceeded the limit values for RON, MON, distillation-evaporation at 100 C, sulphur content. The number of samples exceeding these limits was not provided.
Statistical significance:	The maximum values of all the exceedances were above the tolerance limits of statistical significance for each parameter. Therefore one or more samples were non-compliant with the Directive.
Member State's notes:	See 3.2.1 other details.

3.2.3 Diesel reporting

Sampling

Number of samples:	5922
Frequency of sampling:	Monthly, spread fairly evenly throughout the year.

Reporting

Fuel grades:	Only one available.
Parameters:	No analysis of PAHs.
Other:	

Exceedances of Directive 98/70/EC limit values

1. Diesel

Detail:	Some samples exceeded the limit values for all the parameters measured, however no information was supplied on the numbers of samples exceeding the limits, or the statistical significance of these exceedances.
Statistical significance:	At least some of the samples will be in non-compliance with the Directive.
Member State's notes:	See 3.2.1 other details.

3.3 TEMPORAL TRENDS

The following Figures 3.2 to 3.4 show the 5 year trend in Fuel Quality Monitoring reporting in terms of total fuel sales and low sulphur fuel sales as a proportion of total sales. Because this was the first year of reporting, there were no particular comments to be made.

Figure 3.2: Temporal Trends in National Sales of Petrol and Diesel (million litres)

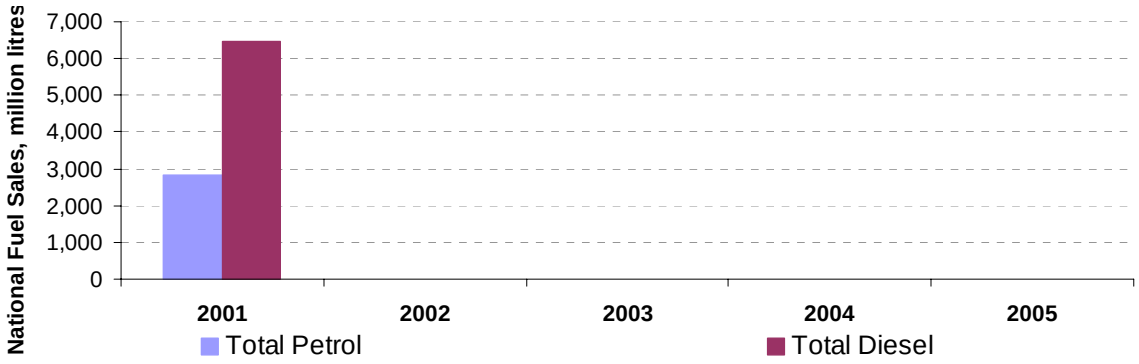


Figure 3.3: Temporal Trends in National Sales Proportions of Low Sulphur Petrol (%)

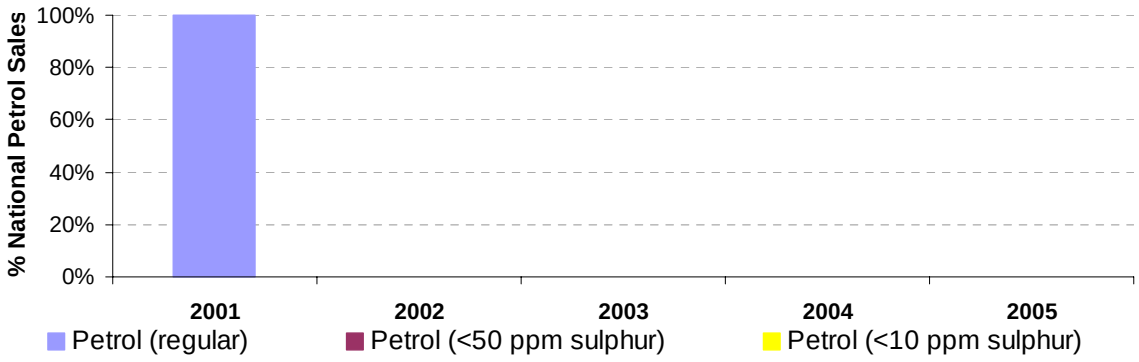
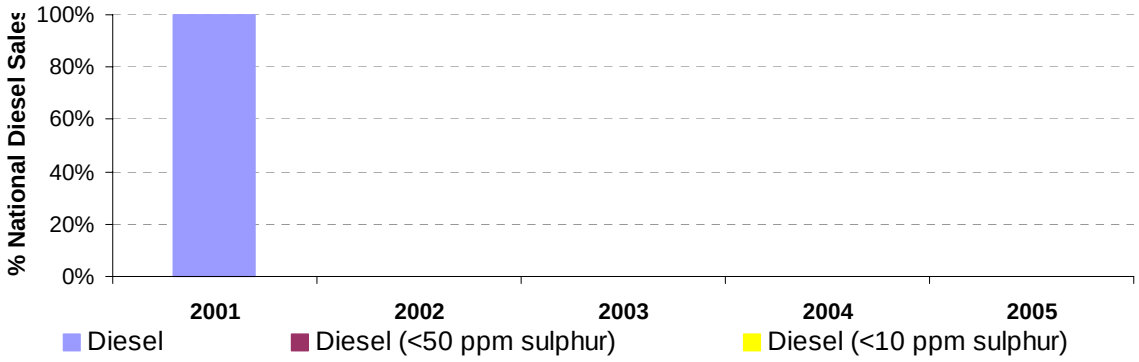


Figure 3.4: Temporal Trends in National Sales Proportions of Low Sulphur Diesel (%)



4 Denmark

4.1 FUEL AVAILABILITY 2001

The following table lists the fuels that were reported to be available nationally in 2001, whether full sales data was provided and the category (the reference number) under which sampling measurements were reported.

Ref. No.	Fuel grade	Sulphur Content	National fuel grade	Sales Data Availability	Reporting Category
1	Petrol min. RON = 91	Regular	RON 92	Yes	1
4	Petrol min. RON = 95	Regular	RON 95	Yes	4
10	Petrol RON > = 98	Regular	RON 98	Yes	10
14	Diesel Fuel	< 50 ppm	-	Yes	14

4.1.1 Sales

Figure4.1: National Fuel sales proportions by fuel type (%)

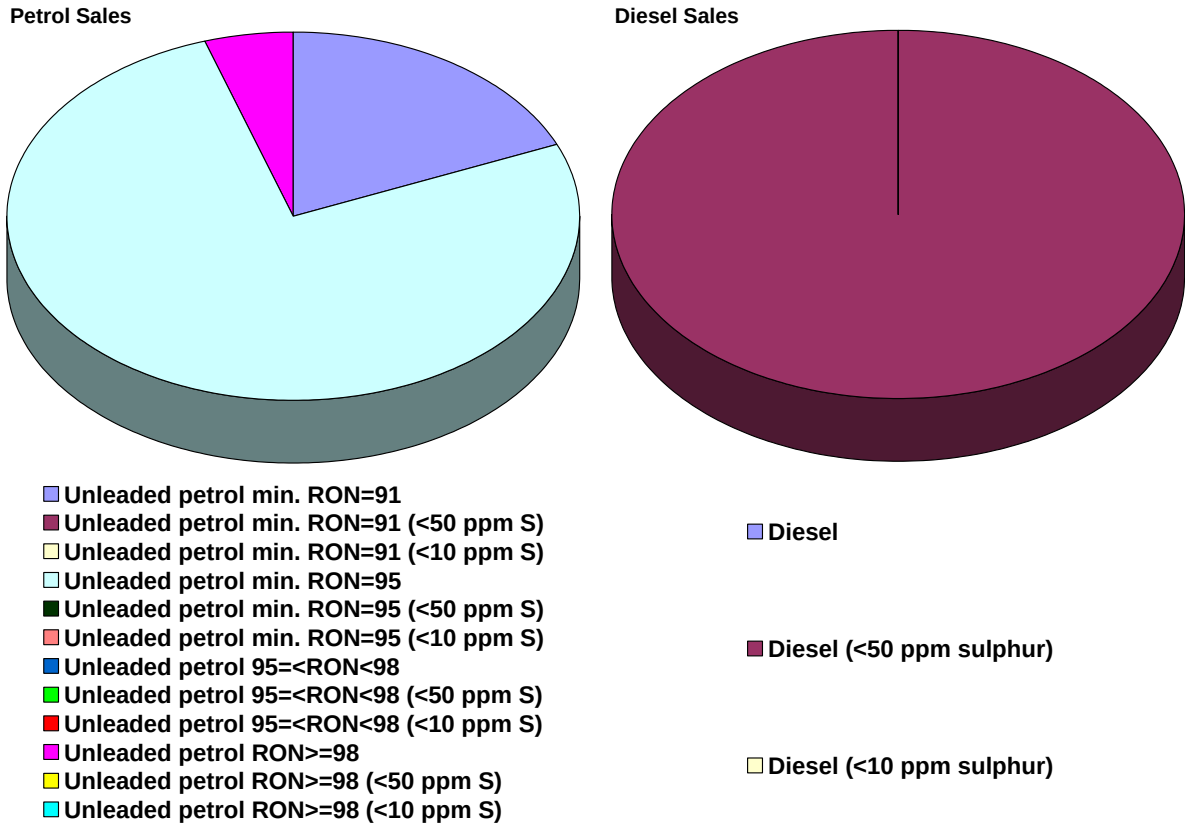


Figure 4.1 above shows that 19% of fuel sales were at the lowest RON91 petrol fuel grade, with the majority of sales (76%) being of RON95 grades and the remainder being RON>98. Whilst there were no low sulphur (<50 ppm) petrol grades available in Denmark in 2001, all diesel fuel sold was of low sulphur content.

4.1.2 Sulphur content

Geographic availability of sulphur-free fuels: none available in 2001.

Average sulphur content of all petrol sold: 47 ppm

Average sulphur content of all diesel sold: 51 ppm

[Average sulphur content is calculated from the mean sulphur content from reporting on the sampled fuels, weighted to the quantities of different petrol or diesel fuel grades sold].

4.2 FUEL QUALITY MONITORING 2001

4.2.1 Description of system

Responsible organisation(s): Danish Environmental Protection Agency, sampling analysis by Saybolt Denmark.

Location(s) of sampling: refuelling retail sites, half from the east of Storebaelt and the other half west of Storebaelt. Samples were taken from a representative spread of suppliers.

Time/frequency of sampling: half in summertime (July), half in wintertime (October).

Number of samples taken: petrol - 40; diesel - 20

Specification of test methods: as specified in Directive 98/70/EC

Collection of sales data: not specified.

Other details: There were two exceedances in 2001, both due to vapour pressures. These exceedances were explored by the refineries and were found to be due to winter grade fuel being left in tanks.

4.2.2 Petrol reporting

Sampling

Summer Period:	Normal: 1st May to 30th September
Number of samples:	40
Frequency of sampling:	July and October only

Reporting

Fuel grades:	The analysis results for the three fuel grades were reported separately.
Parameters:	Only parameters expected to have significant impact on the environment were measured. RON, MON, distillation, oxygen content and all oxygenates (except MTBE) were not measured.
Other:	

Exceedances of Directive 98/70/EC limit values

1. Petrol-RON 92

Detail:	The vapour pressure summer limit value (60 kPa) was exceeded by two samples (62.1 and 65.3 kPa)
Statistical significance:	The statistical significance tolerance limit for vapour pressure is 62.9 kPa, therefore only one of the samples was in breach of the Directive.
Member State's notes:	The Danish environmental protection agency was in contact with the supplying company to get their comments. The company's own measurements were below 60 kPa. See also 4.2.1 other comments.

Exceedances of Directive 98/70/EC limit values

1. Petrol-RON 95

Detail:	The vapour pressure summer limit value (60 kPa) was exceeded by one sample (61.2 kPa). The aromatics limit (42 %(v/v)) was exceeded by one sample also (42.9 %(v/v))
Statistical significance:	The statistical significance tolerance limit for vapour pressure is 62.9 kPa and the tolerance limit for aromatics is 44.1 %(v/v) therefore the samples were not in breach of the Directive.
Member State's notes:	The Danish environmental protection agency was in contact with the supplying company to get their comments. The company's own measurements were below 60 kPa. See also 4.2.1 other comments.

Exceedances of Directive 98/70/EC limit values

1. Petrol-RON 98

Detail:	The vapour pressure summer limit value (60 kPa) was exceeded by one sample (66.1 kPa). The aromatics limit (42 %(v/v)) was exceeded by two samples (42.6 and 43.4 %(v/v))
Statistical significance:	The statistical significance tolerance limit for vapour pressure is 62.9 kPa and the tolerance limit for aromatics is 44.1 %(v/v) therefore the samples were not in breach of the Directive.
Member State's notes:	The Danish environmental protection agency was in contact with the supplying company to get their comments. The explanation was that due to low throughput some winter quality was left in the tank.

4.2.3 Diesel reporting

Sampling

Number of samples: 20

Frequency of sampling: July and October only

Reporting

Fuel grades: Only one grade.

Parameters: All parameters reported.

Other:

Exceedances of Directive 98/70/EC limit values

None

4.3 TEMPORAL TRENDS

The following Figures 4.2 to 4.4 show the 5 year trend in Fuel Quality Monitoring reporting in terms of total fuel sales and low sulphur fuel sales as a proportion of total sales. Because this was the first year of reporting, there were no particular comments to be made.

Figure 4.2: Temporal Trends in National Sales of Petrol and Diesel (million litres)

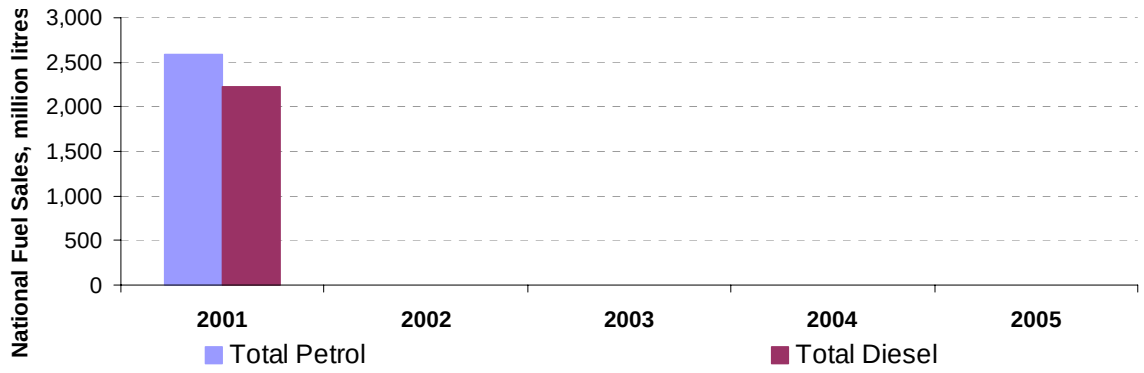


Figure 4.3: Temporal Trends in National Sales Proportions of Low Sulphur Petrol (%)

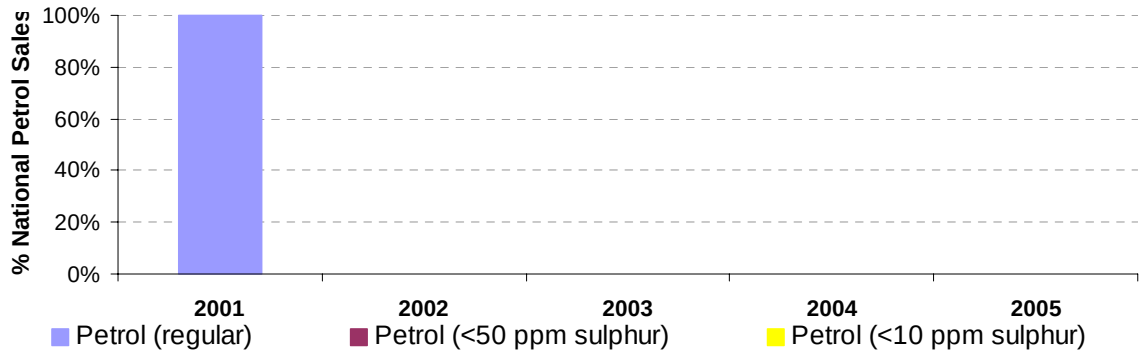
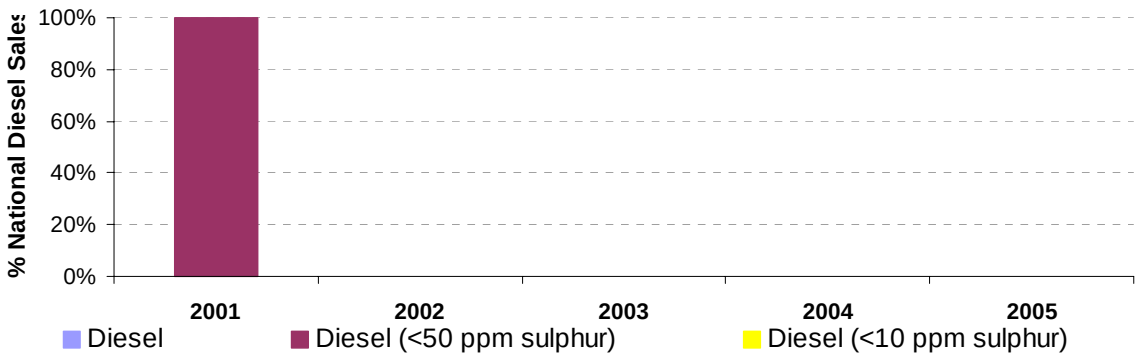


Figure 4.4: Temporal Trends in National Sales Proportions of Low Sulphur Diesel (%)



5 Finland

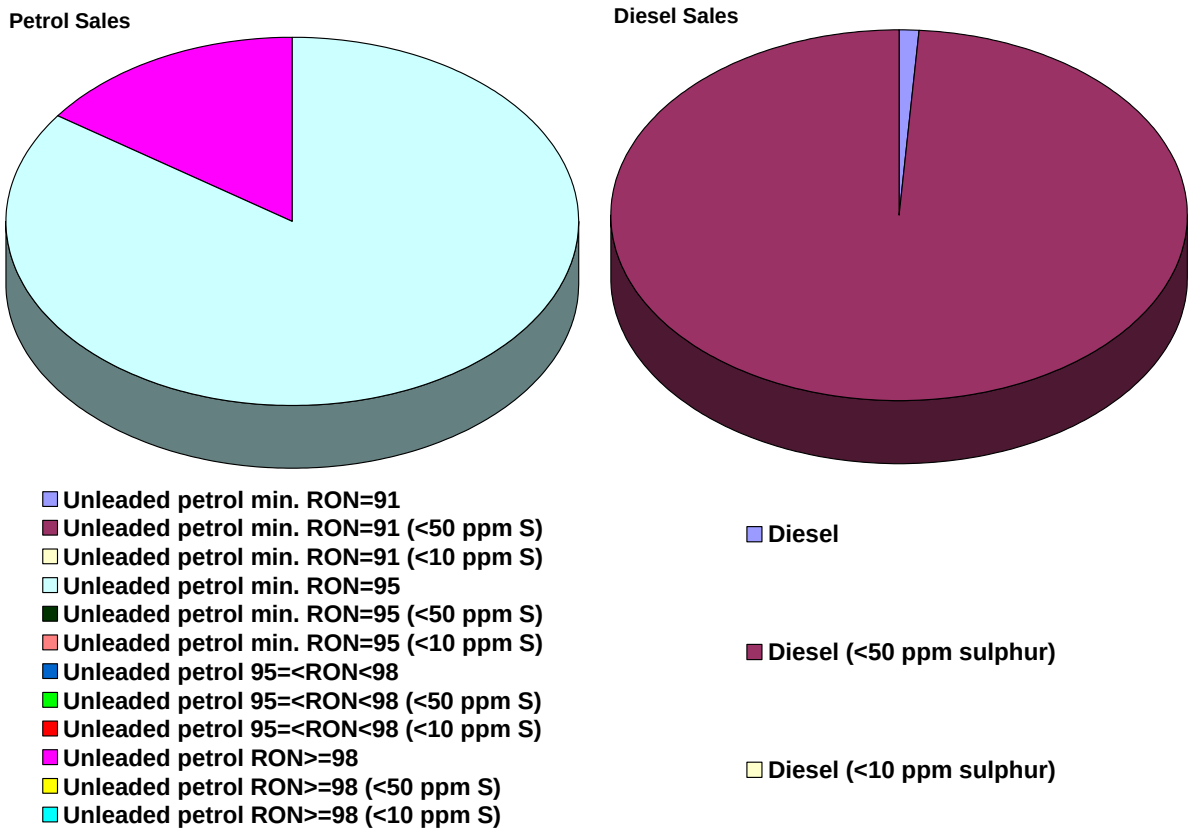
5.1 FUEL AVAILABILITY 2001

The following table lists the fuels that were reported to be available nationally in 2001, whether full sales data was provided and the category (the reference number) under which sampling measurements were reported.

Ref. No.	Fuel grade	Sulphur Content	National fuel grade	Sales Data Availability	Reporting Category
4	Petrol min. RON = 95	Regular	95 Okt.	Yes	4
10	Petrol RON > = 98	Regular	98 Okt. 99 Okt.	Yes	10
13	Diesel Fuel	Regular	-	Yes	13
14	Diesel Fuel	< 50 ppm	-	Yes	13

5.1.1 Sales

Figure 5.1: National Fuel sales proportions by fuel type (%)



Of petrol sales, 85% were of RON95 (95 octane) classification, with the remainder being of RON>98 (98 and 99 octane level fuels). About 99 % of diesel oil was low sulphur diesel (< 50 ppm) and the average sulphur content was among the lowest of all Member States. Petrol with low sulphur content (< 50 ppm) was also available on the market. However, low

sulphur qualities were not separated from the regular (parent) fuel grades in the fuel quality monitoring system. Furthermore, the sulphur content of fuels is not specifically presented at the point of sale, or in the annual sales statistics.

5.1.2 Sulphur content

Geographic availability of sulphur-free fuels: sulphur free grades were not marketed separately in Finland, but the lowest measured at sulphur content in a diesel fuel sample was 3 ppm.

Average sulphur content of all petrol sold: 84 ppm

Average sulphur content of all diesel sold: 33.6 ppm

[Average sulphur content is calculated from the mean sulphur content from reporting on the sampled fuels, weighted to the quantities of different petrol or diesel fuel grades sold].

5.2 FUEL QUALITY MONITORING 2001

5.2.1 Description of system

Responsible organisation(s): the Customs Authority draws up annually a sample taking schedule which is then approved by the Ministry of the Environment. The analysis of samples is carried out by the Customs Laboratory.

Location(s) of sampling: all the various distribution chains across the entire country.

Time/frequency of sampling: each month throughout the year.

Number of samples taken: 192 petrol; 98 diesel.

Specification of test methods: the methods were according to the Directive specifications, with the exception of the lead and sulphur methods. The correctness and accuracy of the sulphur method was verified by means of round robin comparison studies. The lead method's sensitivity was considerably better than the limiting value specified in the quality requirements.

Collection of sales data: National sales data was taken from the statistics compiled by Finnish Oil and the Gas Federation.

Other details: none.

5.2.2 Petrol reporting

Sampling

Summer Period: Arctic: 1st June to 31st August

Number of samples: 192

Frequency of sampling: Monthly

Reporting

Fuel grades:	Two grades reported separately, with separate tables for summer and winter sampling.
Parameters:	All parameters measured regularly except lead.
Other:	10% of the samples taken in 2001 were tested for lead content. All complied with the Directive limits.

Exceedances of Directive 98/70/EC limit values

1. Petrol-RON 95

Detail:	One sample exceeded the oxygen content limit value (2.7 %m/m), with a value 2.9 %m/m. One sample also exceeded the benzene limit (1 %(v/v)) with a value of 1.1 %(v/v).
Statistical significance:	The statistical significance tolerance limit for oxygen content is 2.9 %m/m and the tolerance limit for benzene is 1.1 %(v/v) therefore the samples were not in breach of the Directive.
Member State's notes:	The Customs Laboratory was of the opinion that the results were acceptable.

Exceedances of Directive 98/70/EC limit values

1. Petrol-RON 98

Detail:	Two samples exceeded the oxygen content limit value (2.7 %m/m), with values of 2.8 and 2.8 %m/m. Three samples also exceeded the vapour pressure limit (70 kPa) for the summer period. The maximum recorded value was 82.8 kPa.
Statistical significance:	The statistical significance tolerance limit for oxygen content was 2.9 %m/m, therefore the samples were not in breach of the Directive. The vapour pressure was outside of the zone of statistical tolerance, and was therefore noncompliant with the Directive.
Member State's notes:	The Customs Laboratory was of the opinion that the results were acceptable. The reason for vapour pressure limit value exceedances was that the samples were taken right at the beginning of the summer period, that is the 1st June, and there was still some winter quality fuel left in the storage tanks of petrol stations. The problem affects mainly small stations with relatively low annual throughput. The company was given information about environmental legislation and invited to take better account of the requirements when planning its marketing strategy for the next year.

5.2.3 Diesel reporting

Sampling

Number of samples: 98

Frequency of sampling: Monthly

Reporting

Fuel grades: One grade reported with separate tables for summer and winter sampling.

Parameters: All parameters were measured.

Exceedances of Directive 98/70/EC limit values

1. Diesel

Detail: One sample exceeded the distillation 95% point limit value (360 C) with a value of 360.8. One sample also exceeded the sulphur limit value (350 ppm) with a value of 757 ppm.

Statistical significance: The tolerance limit for distillation is 373 C. Therefore the sampled exceedance cannot be said to be statistically significant, and the fuel was compliant with the Directive. The sulphur content was clearly noncompliant with the Directive.

Member State's notes: The Customs Laboratory was of the opinion that the distillation point result could be accepted as it was below the limit of statistical significance. The reason for the sulphur limit value exceedance was a small amount of noncompliant fuel (apparently heating oil) that had been obtained by the owner of the station and marketed as diesel oil. New samples were taken from the station and the bookkeeping was checked to discover possible further offences of environmental, tax and customs legislation. New samples were clean. Sanctions based on excise duty legislation were given.

5.3 TEMPORAL TRENDS

The following Figures 5.2 to 5.4 show the 5 year trend in Fuel Quality Monitoring reporting in terms of total fuel sales and low sulphur fuel sales as a proportion of total sales. Because this was the first year of reporting, there were no particular comments to be made.

Figure 5.2: Temporal Trends in National Sales of Petrol and Diesel (million litres)

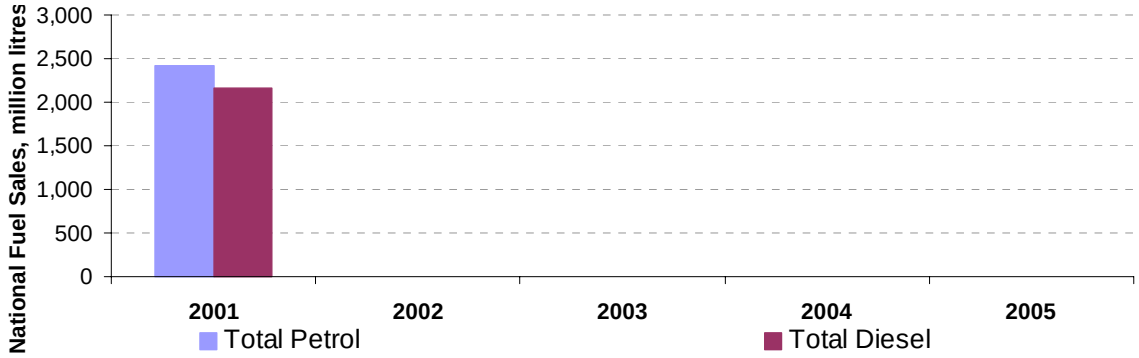


Figure 5.3: Temporal Trends in National Sales Proportions of Low Sulphur Petrol (%)

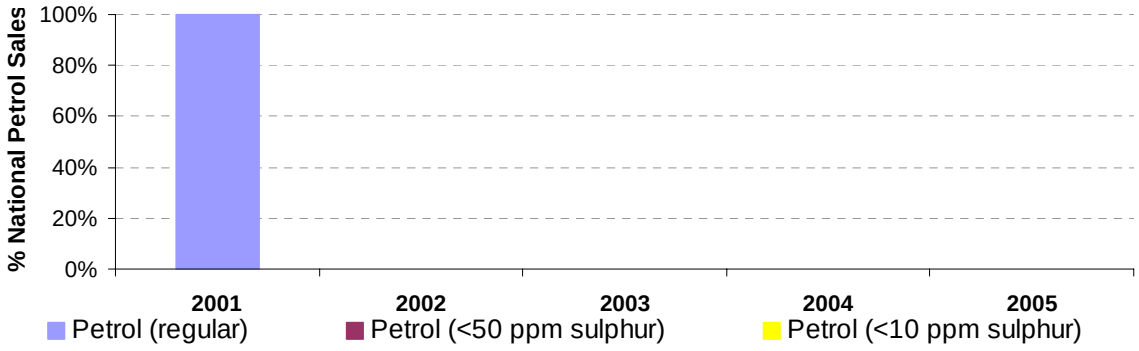
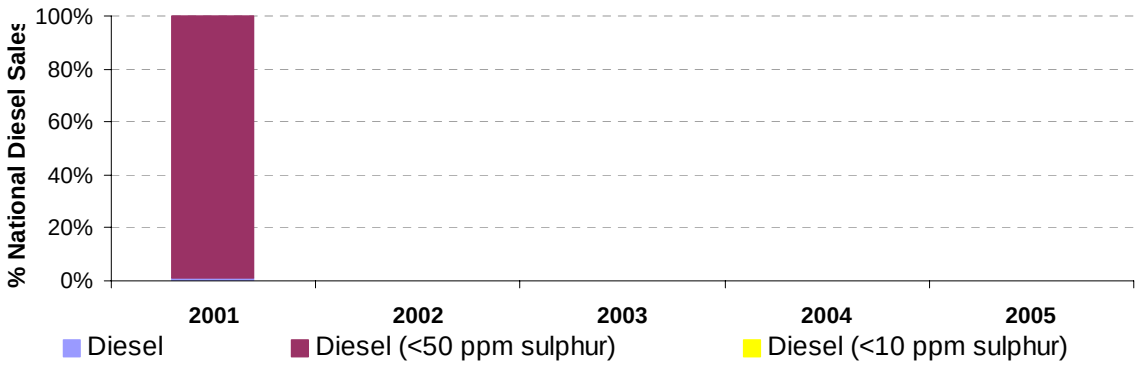


Figure 5.4: Temporal Trends in National Sales Proportions of Low Sulphur Diesel (%)



6 France

6.1 FUEL AVAILABILITY 2001

The following table lists the fuels that were reported to be available nationally in 2001, whether full sales data was provided and the category (the reference number) under which sampling measurements were reported.

Ref. No.	Fuel grade	Sulphur Content	National fuel grade	Sales Data Availability	Reporting Category
4	Petrol min. RON = 95	Regular	-	Yes	4
7	Petrol 95 = < RON < 98	Regular	Super ARS (97 IOR)	Yes	7
10	Petrol RON > = 98	Regular	IOR 98	Yes	10
13	Diesel Fuel	Regular	-	Yes	13
14		< 50 ppm	-	No	-

6.1.1 Sales

Figure 6.1: National Fuel sales proportions by fuel type (%)

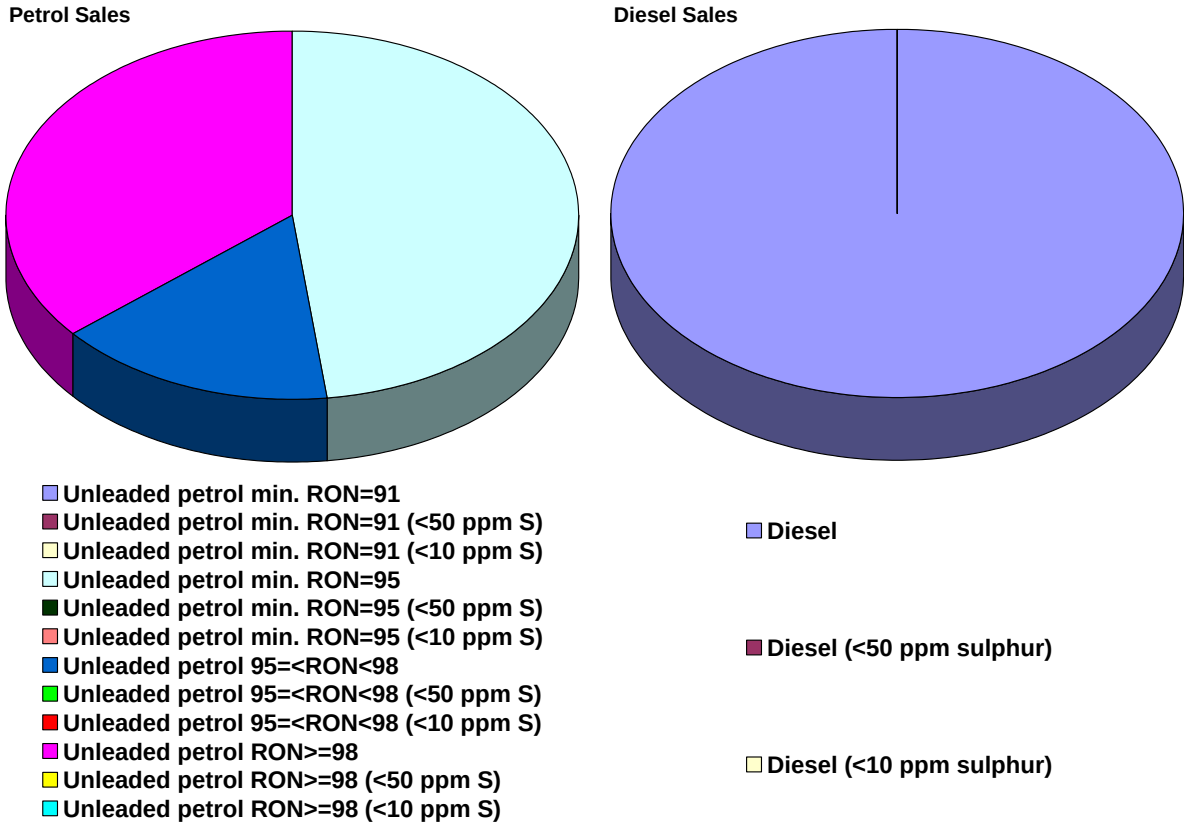


Figure 6.1 shows the proportions of fuel sales in France in 2001. No low sulphur (<50 ppm) fuel grades were available, and petrol grades individually accounted for 48% RON95, 16% RON95-98 and 36% RON>98.

6.1.2 Sulphur content

Geographic availability of sulphur-free fuels: Although no sulphur free fuels were available in France in 2001, around 90,000 tonnes of low sulphur diesel fuels (< 50 ppm) were distributed in refuelling stations of Ile de France and in the regions of Lyon, Grenoble and St Etienne. Low sulphur diesel fuels were also distributed to bus fleets particularly in Nantes.

Average sulphur content of all petrol sold: 93 ppm

Average sulphur content of all diesel sold: 295 ppm

[Average sulphur content is calculated from the mean sulphur content from reporting on the sampled fuels, weighted to the quantities of different petrol or diesel fuel grades sold].

6.2 FUEL QUALITY MONITORING 2001

6.2.1 Description of system

Responsible organisation(s): Ministry of Industry

Location(s) of sampling: Petrol samples taken from four different regions: Ile de France, Languedoc, Auvergne and Rhône-Alpes. Diesel fuels were sampled in six regions: le Nord, le Pas de Calais, les Pyrénées Orientales and la Seine, Marne, le Bas-Rhin and la Savoie. The types of locations sampled were not specified.

Time/frequency of sampling: sampling was carried out on a quarterly basis.

Number of samples taken: 120 petrol samples and 79 diesel samples were taken.

Specification of test methods: test methods were as outlined in the Directive and EN228:2000

Collection of sales data: not specified.

Other details: France has an old monitoring system that is not yet adapted to the new Directive. The 2001 report was prepared using this old system, which did not provide sufficient data. Where there are quality exceedances, the refinery is contacted for explanation.

6.2.2 Petrol reporting

Sampling

Summer Period:	Normal: 1st May to 30th September
Number of samples:	120
Frequency of sampling:	Quarterly

Reporting

Fuel grades:	3 grades reported in separate tables
Parameters:	RON, MON, vapour pressure, olefins, aromatics, oxygen content,

and all oxygenates are **not** measured.

Other: The current fuel quality monitoring system is old and will also be used in 2002 reporting, however it will be revised in 2003 to include further detail.

Exceedances of Directive 98/70/EC limit values

1. Petrol RON 95

Detail: One sample exceeded the limit for distillation-evaporation at 100 C (46.0%(v/v) min.) at 45.5%(v/v), and one exceeded the limit for sulphur (150 mg/kg) at 210 mg/kg.

Statistical significance: The exceedance for sulphur was above the tolerance limit (150.5 mg/kg) and therefore was noncompliant with the Directive.

Insufficient information was provided to allow assessment of exceedances in comparison with distillation tolerance limits.

Member State's notes: See 6.2.1 other details.

Exceedances of Directive 98/70/EC limit values

1. Petrol RON 99

Detail: One sample exceeded the limit for distillation-evaporation at 100 C (46.0%(v/v) min.) at 45%(v/v), and one exceeded the limit for benzene content (1.0 %(v/v)) at 4.0 %(v/v).

Statistical significance: The exceedance for benzene was above the tolerance limit (1.1 %(v/v)) and therefore was noncompliant with the Directive.

Insufficient information was provided to allow assessment of exceedances in comparison with distillation tolerance limits.

Member State's notes: See 6.2.1 other details.

6.2.3 Diesel reporting

Sampling

Number of samples: 79

Frequency of sampling: Quarterly

Reporting

Fuel grades: 1

Parameters: Distillation - 95% point and PAH are not measured.

Other:

Exceedances of Directive 98/70/EC limit values

1. Diesel

Detail:	One sample was above the maximum limit for density at 15 C (345 kg/m^3) with 845.9 kg/m^3, and one sample was above the limit for sulphur (350 mg/kg) with 370 mg/kg
Statistical significance:	Both samples are in exceedance of the tolerance limits for the test methods (845.7 kg/m^3 and 353 mg/kg respectively), and are therefore in non-compliance with the Directive.
Member State's notes:	See 6.2.1 other details.

6.3 TEMPORAL TRENDS

The following Figures 6.2 to 6.4 show the 5 year trend in Fuel Quality Monitoring reporting in terms of total fuel sales and low sulphur fuel sales as a proportion of total sales. Because this was the first year of reporting, there were no particular comments to be made.

Figure 6.2: Temporal Trends in National Sales of Petrol and Diesel (million litres)

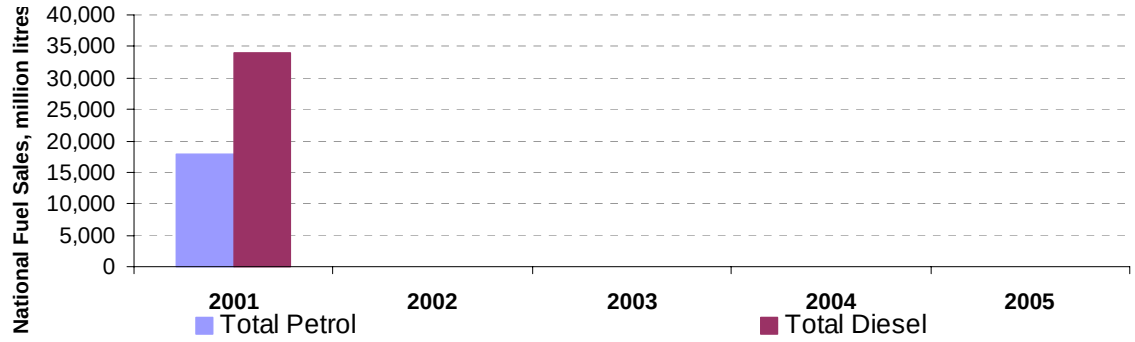


Figure 6.3: Temporal Trends in National Sales Proportions of Low Sulphur Petrol (%)

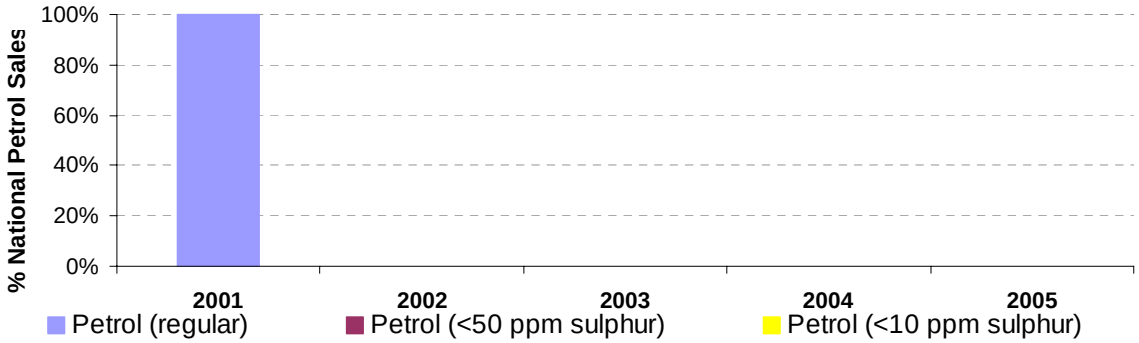
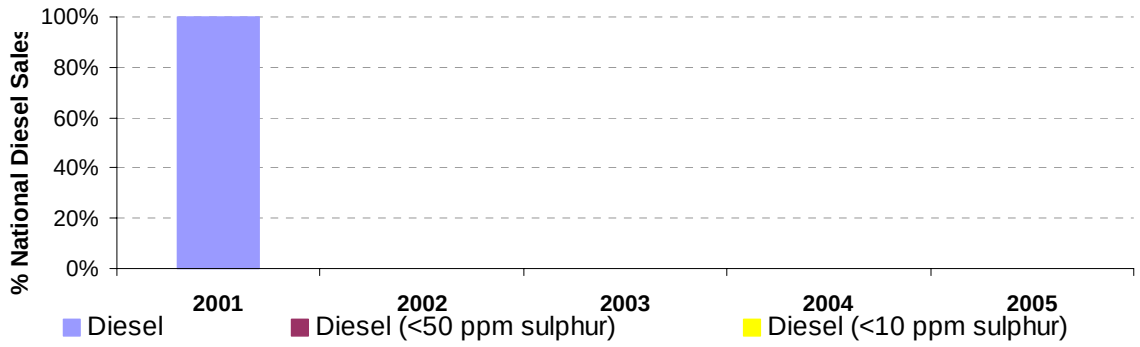


Figure 6.4: Temporal Trends in National Sales Proportions of Low Sulphur Diesel (%)



7 Germany

7.1 FUEL AVAILABILITY 2001

The following table lists the fuels that were reported to be available nationally in 2001, whether full sales data was provided and the category (the reference number) under which sampling measurements were reported.

Ref. No.	Fuel grade	Sulphur Content	National fuel grade	Sales Data Availability	Reporting Category
1	Petrol min. RON = 91	Regular	Benzin Normal	Yes	1
2	Petrol min. RON = 91	< 50 ppm	Benzin Normal	Yes	1
4	Petrol min. RON = 95	Regular	Eurosuper	Yes	4
5	Petrol min. RON = 95	< 50 ppm	Eurosuper	Yes	5
12	Petrol RON > = 98	< 10 ppm	Super Plus	Yes	12
13	Diesel Fuel	Regular	Dieselkraftstoff	Yes	13
14	Diesel Fuel	< 50 ppm	Dieselkraftstoff, winiger als 50ppm	Yes	14

7.1.1 Sales

Figure 7.1: National Fuel sales proportions by fuel type (%)

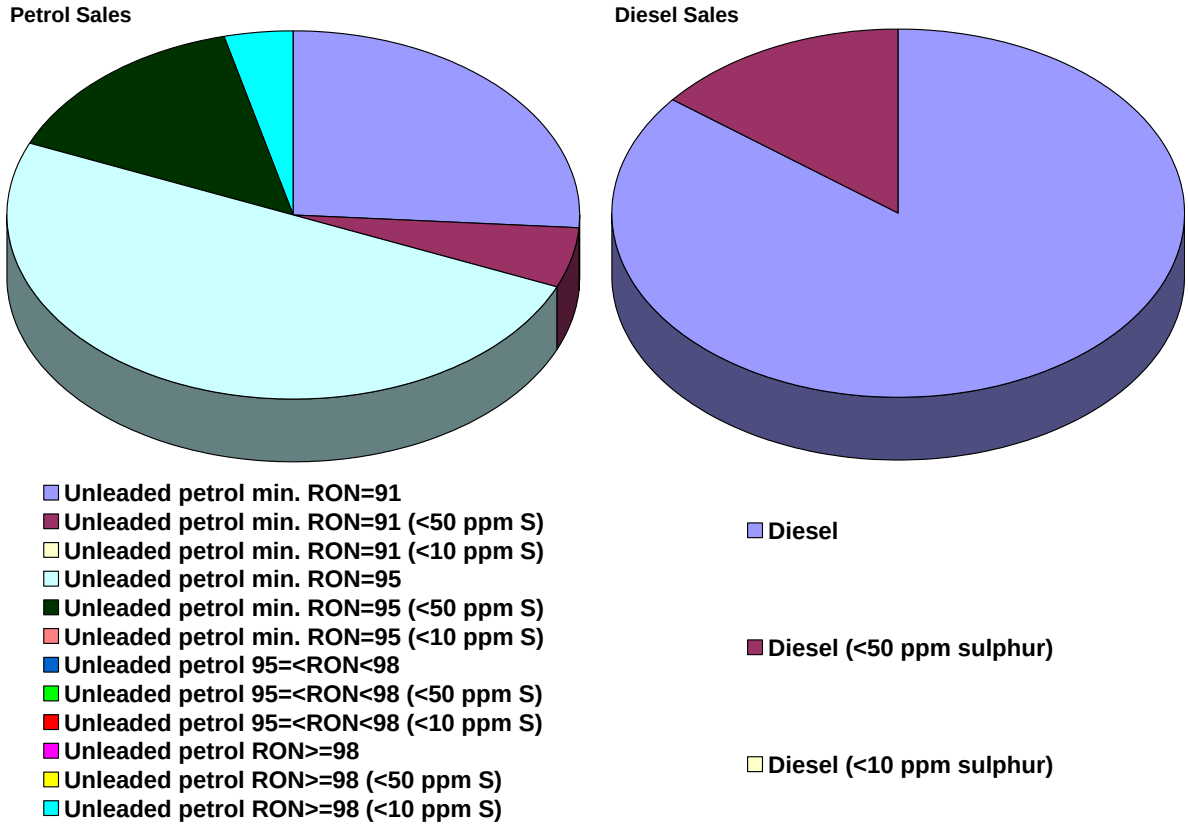


Figure 7.1 shows that a wide variety of different fuel grades at varying sulphur levels were available on the German market in 2001. Whilst most of the fuel sold was RON95 quality (50% Eurosuper, 15% Eurosuper with <50 ppm sulphur), 31% of fuel sold was still RON91 (26% regular and 5% low sulphur). RON>98 petrol was only available as sulphur free (<10 ppm) in 2001 and 14% of diesel sold was low sulphur (<50 ppm).

7.1.2 Sulphur content

Geographic availability of sulphur-free fuels: super plus Petrol (98 octane) was offered as sulphur free throughout Germany since winter 2000. Sales of low sulphur fuels were promoted since November 2001 through tax incentives and sales of sulphur free fuels were promoted from January 2003 through tax incentives.

Average sulphur content of all petrol sold: 54 ppm

Average sulphur content of all diesel sold: 249 ppm

[Average sulphur content is calculated from the mean sulphur content from reporting on the sampled fuels, weighted to the quantities of different petrol or diesel fuel grades sold].

7.2 FUEL QUALITY MONITORING 2001

7.2.1 Description of system

Responsible organisation(s): Federal Environmental Protection Agency, and the Federal Offices underneath it.

Location(s) of sampling: at refuelling stations across the country.

Time/frequency of sampling: monthly across the year.

Number of samples taken: 792 petrol and 325 diesel.

Specification of test methods: Gemäß DIN EN 228 bzw. DIN EN570.

Collection of sales data: gathered and published by the Federal Office for Economy and Export Control on the basis of the Mineral Oil Data Law.

Other details: With regard to specification exceedances, according to German Law the first stage is to determine, by deviations from the standard, who the person responsible is. Deviations from the standard will be punished if a responsible person can be clearly established and any deceptions or attempts at deception can be proven. Such infringements will be punished with fines, otherwise a tighter monitoring of the delivery papers and fuel sold will take place.

7.2.2 Petrol reporting

Sampling

Summer Period:	Normal: 1st May to 30th September
Number of samples:	792
Frequency of sampling:	Monthly across the year

Reporting

Fuel grades: 3 grades reported separately

Parameters: Partially, all parameters measured.

Other:

Exceedances of Directive 98/70/EC limit values

1. Petrol RON91

Detail: 3 samples exceeded the vapour pressure limit for summer (60 kPa) with the highest being 63.1 kPa. One sample exceeded both limits for distillation (46.0 and 75.0 %(v/v)) with values of 27 and 50 %(v/v) respectively.

Statistical significance: At least one of samples exceeded the tolerance limit for vapour pressure (62.9 kPa). The sample exceeding the distillation limits was also beyond the tolerance zone. Therefore these samples were noncompliant with the Directive.

Member State's notes: See 7.2.1 other details.

Exceedances of Directive 98/70/EC limit values

1. Petrol RON95

Detail: 2 samples exceeded the vapour pressure limit for summer (60 kPa) with the highest being 63.3 kPa.

Statistical significance: At least one of the samples exceeded the tolerance limit for vapour pressure (62.9 kPa). Therefore these samples were noncompliant with the Directive.

Member State's notes: See 7.2.1 other details.

Exceedances of Directive 98/70/EC limit values

1. Petrol RON98

Detail: 1 sample exceeded the vapour pressure limit for summer (60 kPa) with the highest being 66.1 kPa. One sample was also below the minimum limit for MON (85), with 84.4.

Statistical significance: Both samples exceeded the tolerance limits for vapour pressure (62.9 kPa) and MON (84.5 min.) respectively. Therefore these samples were noncompliant with the Directive.

Member State's notes: Oxygen content was not measured for super plus petrol, however Germany does not believe this to be critical because it can be easily calculated from the MTBE content and these measurements were in line with the limits. See also 7.2.1 other details.

7.2.3 Diesel reporting

Sampling

Number of samples: 345

Frequency of sampling: Monthly throughout the year

Reporting

Fuel grades: 3 grades are reported separately (although sulphur free diesel was not sold in 2001).

Parameters: All parameters were measured, except for PAH in sulphur free diesel.

Other: The testing federal authorities instigated the analyses of sulphur free diesel because of the adherence to the sulphur limit value.

Exceedances of Directive 98/70/EC limit values

1. Diesel

Detail: One sample was above the limit for sulphur content (350 mg/kg) with 400 mg/kg.

Statistical significance: This sample was beyond the tolerance limits (353 mg/kg), and therefore was noncompliant with the Directive.

Member State's notes: See 7.2.1 other details.

7.3 TEMPORAL TRENDS

The following Figures 7.2 to 7.4 show the 5 year trend in Fuel Quality Monitoring reporting in terms of total fuel sales and low sulphur fuel sales as a proportion of total sales. Because this was the first year of reporting, there were no particular comments to be made.

Figure 7.2: Temporal Trends in National Sales of Petrol and Diesel (million litres)

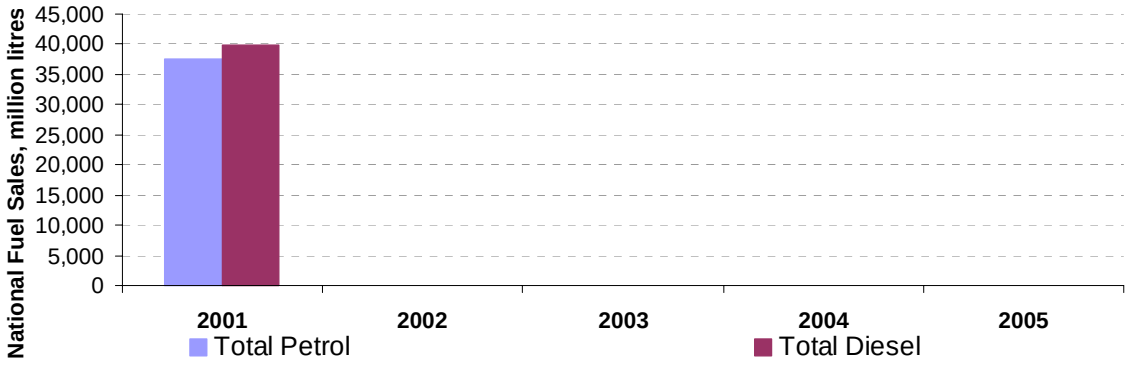


Figure 7.3: Temporal Trends in National Sales Proportions of Low Sulphur Petrol (%)

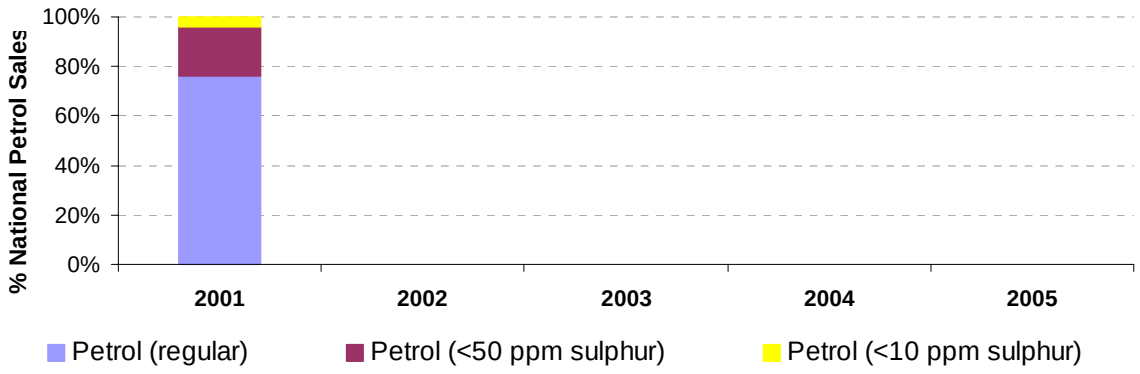
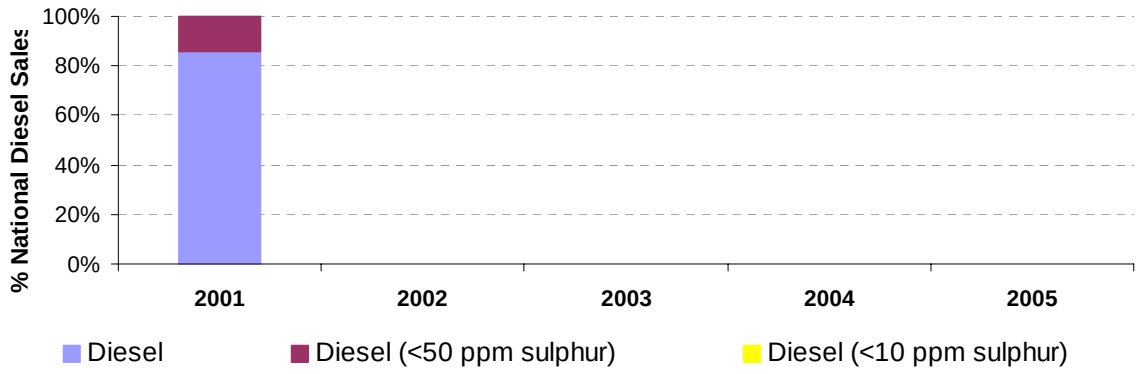


Figure 7.4: Temporal Trends in National Sales Proportions of Low Sulphur Diesel (%)



8 Greece

8.1 FUEL AVAILABILITY 2001

The following table lists the fuels that were reported to be available nationally in 2001, whether full sales data was provided and the category (the reference number) under which sampling measurements were reported.

Ref. No.	Fuel grade	Sulphur Content	National fuel grade	Sales Data Availability	Reporting Category
4	Petrol min. RON = 95	Regular	-	Yes	4
7	Petrol 95 = < RON < 98	Regular	-	Yes	7
13	Diesel Fuel	Regular	-	Yes	13

8.1.1 Sales

Figure 8.1: National Fuel sales proportions by fuel type (%)

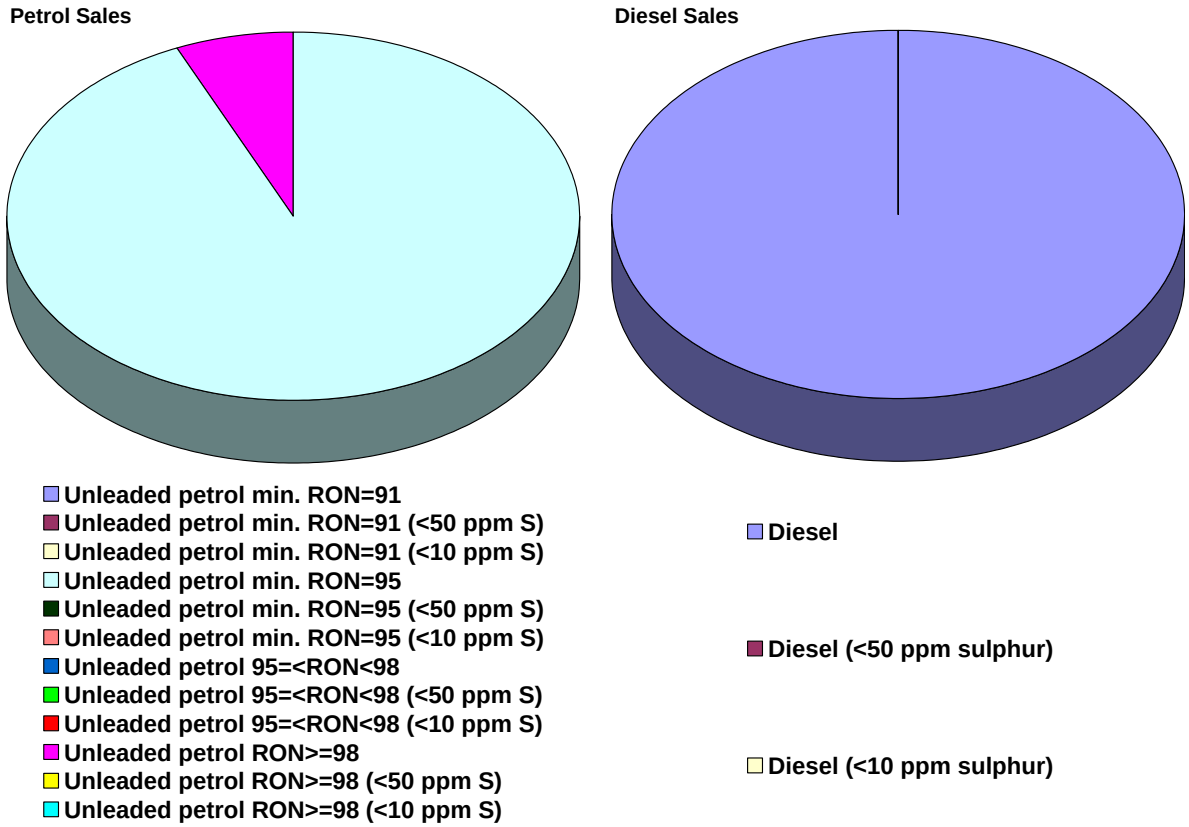


Figure 8.1 above shows that only two grades of petrol were available in Greece in 2001, with the majority of petrol sold (93%) being RON95 (95 octane) level. No low or sulphur free fuels were available in 2001.

8.1.2 Sulphur content

Geographic availability of sulphur-free fuels: not available

Average sulphur content of all petrol sold: 108 ppm

Average sulphur content of all diesel sold: 281 ppm

[Average sulphur content is calculated from the mean sulphur content from reporting on the sampled fuels, weighted to the quantities of different petrol or diesel fuel grades sold].

8.2 FUEL QUALITY MONITORING 2001

8.2.1 Description of system

Responsible organisation(s): General State Chemical Laboratory

Location(s) of sampling: at refineries, storage tanks of the marketing companies, at fuel transportation trucks, at vessels and ships, at petrol stations, cars etc.

Time/frequency of sampling: monthly throughout the year

Number of samples taken: 103 petrol and 53 diesel

Specification of test methods: not specified.

Collection of sales data: not specified.

Other details: Sampling is done at refineries and customs points as well as retailing stations but this may not have been included in the report. Sampling at refineries and customs points was not originally set up to measure all parameters as it is aimed at combating fraud.

8.2.2 Petrol reporting

Sampling

Summer Period:	Normal: 1st May to 30th September
Number of samples:	103
Frequency of sampling:	Monthly throughout the year

Reporting

Fuel grades:	Two fuel grades reported separately and with separate reporting for summer and winter sampling.
Parameters:	Oxygen content and all oxygenates were not measured, except ethers with more than five carbon atoms per molecule.
Other:	Only ethers were added, and were in compliance with the Directive.

Exceedances of Directive 98/70/EC limit values

1. Petrol RON95

Detail:	One sample exceeded the summer vapour pressure limit (60 kPa), with 60.3 kPa.
Statistical significance:	The exceedances within the limit of tolerance (62.9 kPa) and therefore the sample could not be said to be noncompliant with the Directive.
Member State's notes:	None provided.

8.2.3 Diesel reporting

Sampling

Number of samples:	53
Frequency of sampling:	Monthly throughout the year

Reporting

Fuel grades:	1
Parameters:	All parameters are measured
Other:	

Exceedances of Directive 98/70/EC limit values

1. Diesel

Detail:	One sample exceeded the limit value for distillation 95% point (360 kg/m3), with 364 kg/m3.
Statistical significance:	This was within the zone of tolerance for this parameter (373 kg/m3) and could not therefore be said to be noncompliant with the Directive.
Member State's notes:	None provided.

8.3 TEMPORAL TRENDS

The following Figures 8.2 to 8.4 show the 5 year trend in Fuel Quality Monitoring reporting in terms of total fuel sales and low sulphur fuel sales as a proportion of total sales. Because this was the first year of reporting, there were no particular comments to be made.

Figure 8.2: Temporal Trends in National Sales of Petrol and Diesel (million litres)

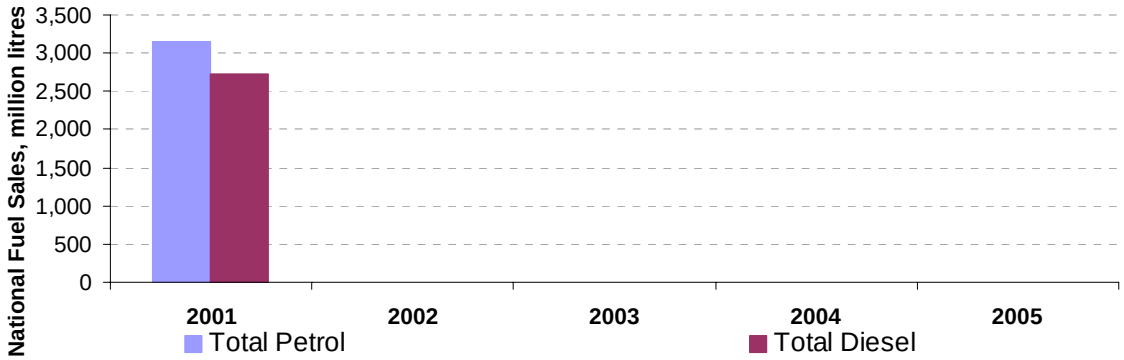


Figure 8.3: Temporal Trends in National Sales Proportions of Low Sulphur Petrol (%)

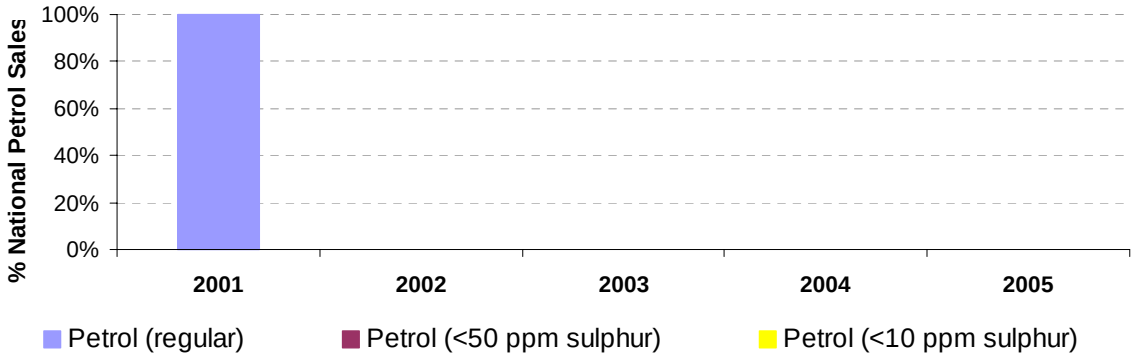
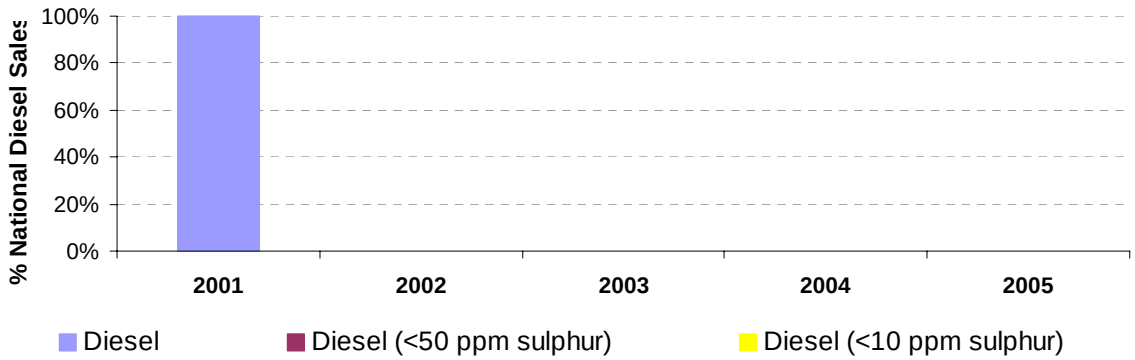


Figure 8.4: Temporal Trends in National Sales Proportions of Low Sulphur Diesel (%)



9 Ireland

9.1 FUEL AVAILABILITY 2001

The following table lists the fuels that were reported to be available nationally in 2001, whether full sales data was provided and the category (the reference number) under which sampling measurements were reported.

Ref. No.	Fuel grade	Sulphur Content	National fuel grade	Sales Data Availability	Reporting Category
4	Petrol min. RON = 95	Regular	Unleaded petrol (max < 96 RON)	Yes	4
5		< 50 ppm	Unleaded petrol (max < 96 RON, < 50 ppm S)	Yes	4
6		< 10 ppm	Unleaded petrol (max < 96 RON, < 10 ppm S)	Yes	4
7	Petrol 95 = < RON < 98	Regular	Unleaded petrol (>= 96 RON)	Yes	4
13	Diesel Fuel	Regular	Diesel fuel	Yes	13

9.1.1 Sales

Figure 9.1: National Fuel sales proportions by fuel type (%)

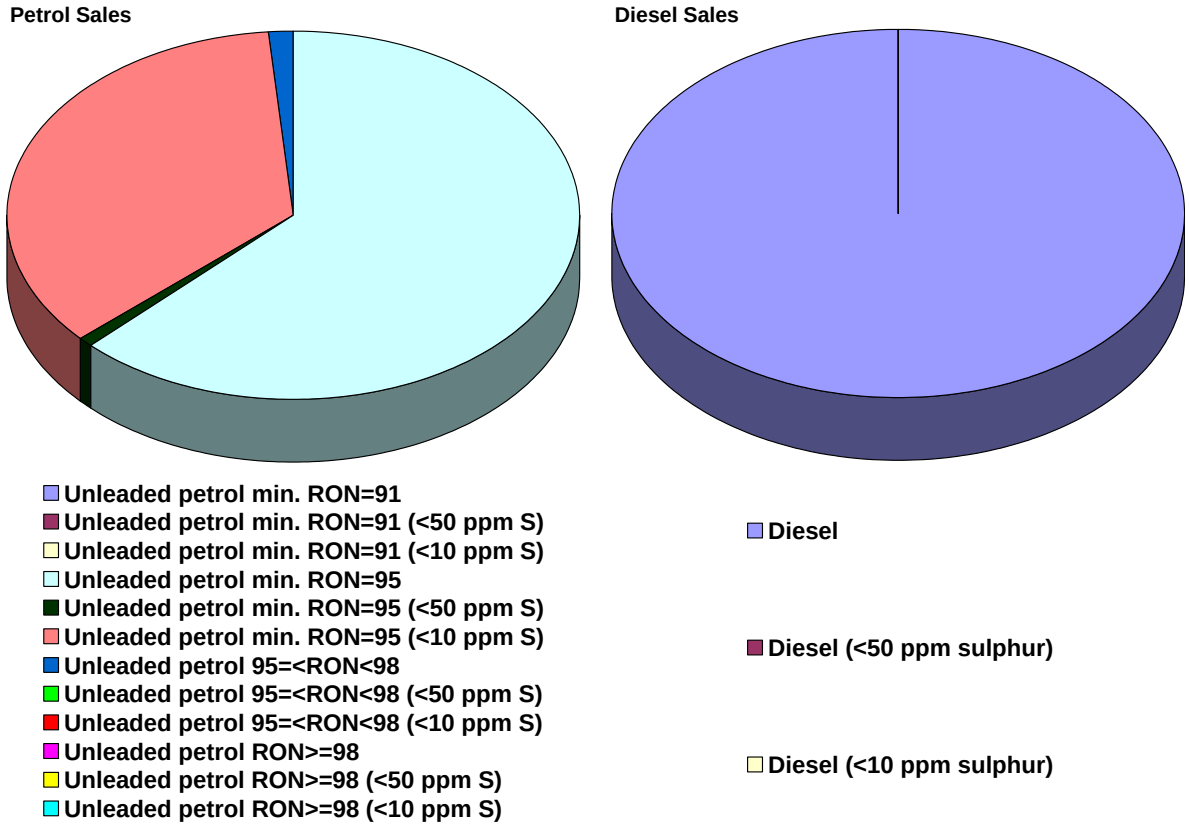


Figure 9.1 shows that although in 2001 diesel was only available as one grade, there were a number of different petrol grades available, with the majority of sales being of RON95 grade (RON<96 national grade) at regular sulphur content (63% sales) and also sulphur free (35% sales).

9.1.2 Sulphur content

Geographic availability of sulphur-free fuels: Petrol produced by the refinery at Whitegate was sulphur free and was distributed to cover the Munster area, Limerick, Galway and New Ross. In total this accounted for some 36% of national sales of petrol in 2001 and geographically covers Munster, parts of the midlands, western seaboard and south-eastern region.

Average sulphur content of all petrol sold: 83 ppm

Average sulphur content of all diesel sold: 231 ppm

[Average sulphur content is calculated from the mean sulphur content from reporting on the sampled fuels, weighted to the quantities of different petrol or diesel fuel grades sold].

9.2 FUEL QUALITY MONITORING 2001

9.2.1 Description of system

Responsible organisation(s): Department of the Environment and Local Government

Location(s) of sampling: Ireland has one national refinery located at Whitegate, County Cork. All products are batched and fully tested by the refinery operator prior to release. Samples taken at the refinery, oil terminals are analysed by the state laboratory. Retail sites, road tankers, commercial vehicles etc. are sampled by the Office of the Revenue Commissioners. Individual oil companies test their products at home refinery and on receipt at terminals, a certificate of quality is available for inspection fore each cargo/batch. Further quality spot checks are carried out at selected retail sites to give quality traceability from refinery to end user.

Time/frequency of sampling: monthly throughout the year.

Number of samples taken: 79 petrol and 44 diesel

Specification of test methods: in accordance with the Directive.

Collection of sales data: sourced from the Department of Public Enterprise

Other details: the availability of sulphur free petrol is a quirk of the refining process used, and the sulphur free petrol is not marketed separately from regular grades.

9.2.2 Petrol reporting

Sampling

Summer Period:	Arctic: 1st June to 31st August
Number of samples:	79
Frequency of sampling:	Quarterly throughout the year, together with spot checks at selected retail sites.

Reporting

Fuel grades:	Four grades with measurements reported together in a single table
Parameters:	All parameters were measured
Other:	

Exceedances of Directive 98/70/EC limit values

1. Petrol

Detail:	Initially 30 individual parameters from 25 samples were indicated as being outside the specifications of 98/70/EC. The parameters were sulphur (7), RON (3), MON (1), olefins (1), vapour pressure (2), aromatics (2), benzene (2) and distillation: evaporation at 100 degrees (12).
Statistical significance:	See Member State's notes below (relating to the samples outside of the tolerance limits).
Member State's notes:	7 individual parameters from 6 different were worthy of further consideration. One sample had 2 parameters at issue namely aromatics content and distillation (evaporation at 100 C). 2 parameters relate to benzene which are in compliance when the reproducibility is considered to one decimal place as are the parameters in the directive but outside the Directive when the reproducibility is considered to two decimal places as was done in Ireland following procedures in the relevant standard (ISO 4259). This is a discrepancy in the legislation and has been raised with CEN by Italy in the past we understand. The matter should be addressed in a forthcoming revision to EN 228, the general standard relating to gasoline quality. On this basis, these samples cannot be considered to have exceeded the requirements of 98/70/EC. 4 parameters related to distillation point and 1 parameter to aromatics. It has been suggested that sample evaporation may have affected these results as the samples were stored for a longer period than desirable prior to analysis. Hence, Ireland believes the samples cannot be deemed categorically to be in exceedance but has raised the matter with industry.

9.2.3 Diesel reporting

Sampling

Number of samples: 44

Frequency of sampling: Monthly throughout the year

Reporting

Fuel grades: 1

Parameters: All parameters measured

Other:

Exceedances of Directive 98/70/EC limit values

1. Diesel

Detail: One sample exceeded the specification for Cetane number (51.0), with 49.4. One sample exceeded the specification for distillation 95% point (360 C.), with 360.6 C.

Statistical significance: Both samples fell within the zone of tolerance and could not therefore be judged noncompliant with the Directive.

Member State's notes: -

9.3 TEMPORAL TRENDS

The following Figures 9.2 to 9.4 show the 5 year trend in Fuel Quality Monitoring reporting in terms of total fuel sales and low sulphur fuel sales as a proportion of total sales. Because this was the first year of reporting, there were no particular comments to be made.

Figure 9.2: Temporal Trends in National Sales of Petrol and Diesel (million litres)

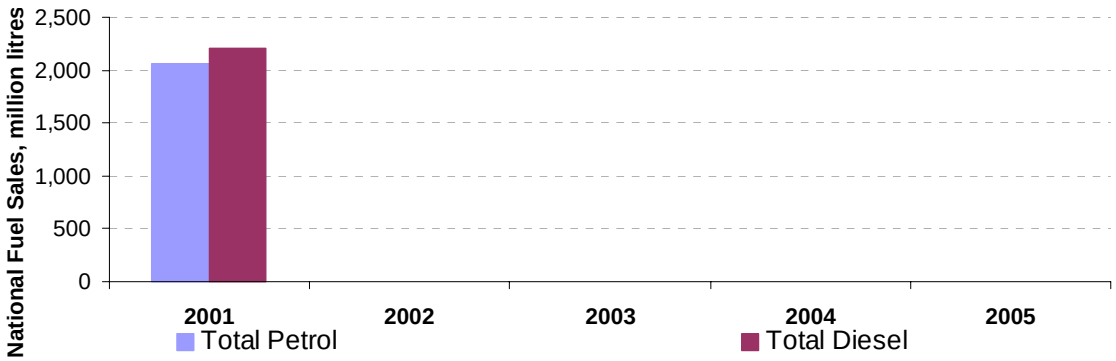


Figure 9.3: Temporal Trends in National Sales Proportions of Low Sulphur Petrol (%)

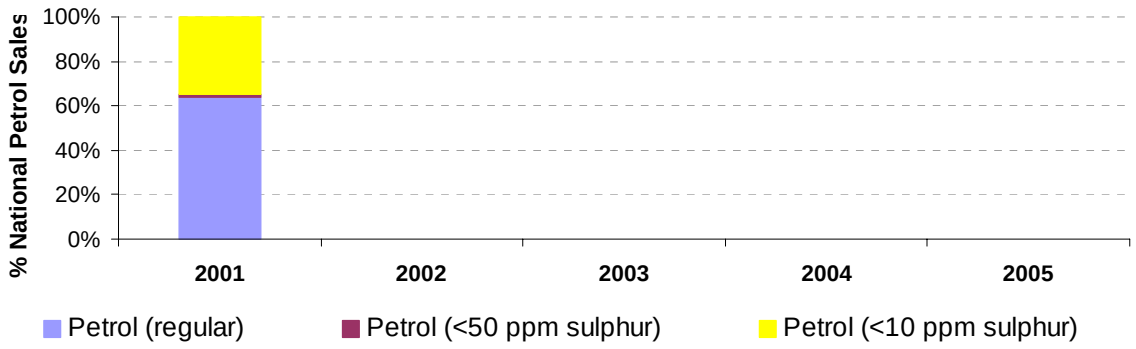
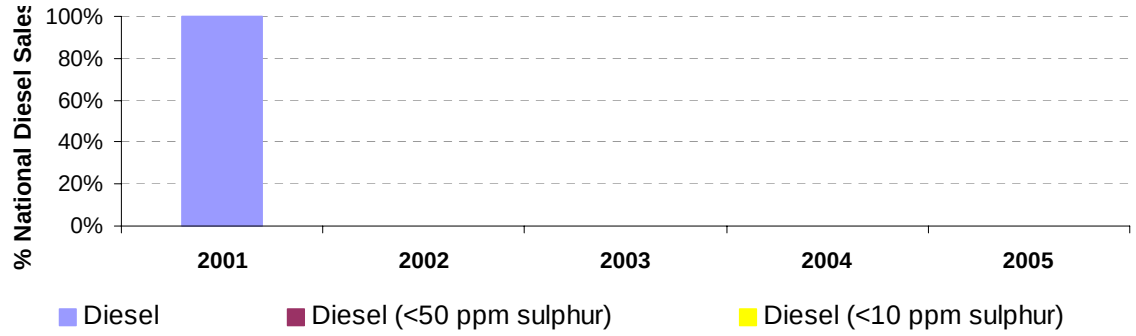


Figure 9.4: Temporal Trends in National Sales Proportions of Low Sulphur Diesel (%)



10 Italy

10.1 FUEL AVAILABILITY 2001

The following table lists the fuels that were reported to be available nationally in 2001, whether full sales data was provided and the category (the reference number) under which sampling measurements were reported.

Ref. No.	Fuel grade	Sulphur Content	National fuel grade ID	Sales Data Availability	Reporting Category
4	Petrol min. RON = 95	Regular	-	Yes	4
13	Diesel Fuel	Regular	-	Yes	13

10.1.1 Sales

Figure 10.1: National Fuel sales proportions by fuel type (%)

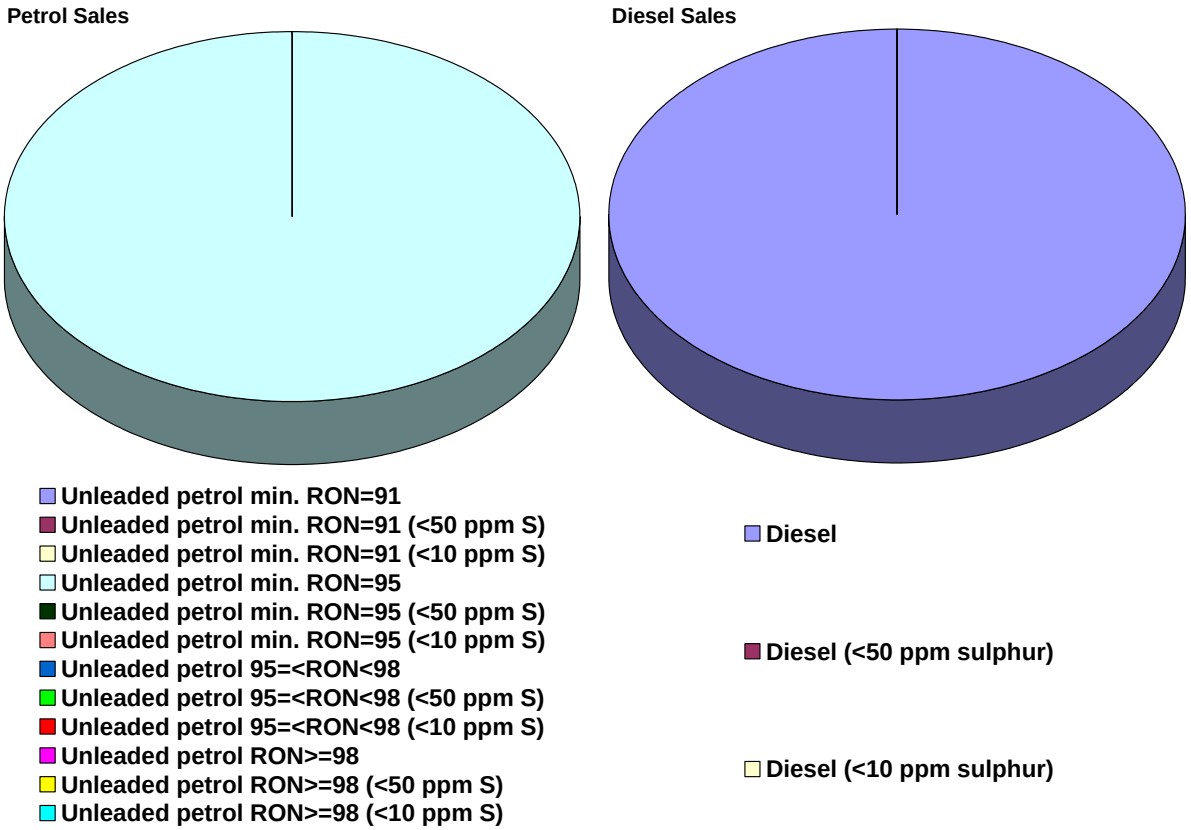


Figure 10.1 shows that all of petrol sales accounted for were of RON95 grade and all diesel fuel sold was of the regular grade.

10.1.2 Sulphur content

Geographic availability of sulphur-free fuels: not available in 2001.

Average sulphur content of all petrol sold: 61 ppm

Average sulphur content of all diesel sold: 273 ppm

[Average sulphur content is calculated from the mean sulphur content from reporting on the sampled fuels, weighted to the quantities of different petrol or diesel fuel grades sold].

10.2 FUEL QUALITY MONITORING 2001

10.2.1 Description of system

Responsible organisation(s): ANPA

Location(s) of sampling: sales outlets throughout the Italian territory.

Time/frequency of sampling: June to December 2001 and January and February 2002.

Number of samples taken: 225 petrol and 241 diesel.

Specification of test methods: in accordance with the Directive.

Collection of sales data: Not specified.

Other details: The national system for the quality control of motor vehicle fuels had not been set up yet, and the report from Italy had been drawn up on the basis of the monitoring by sampling the sales outlets distributed throughout the Italian territory, carried out by independent supervisory bodies on behalf of the main oil companies.

The data were checked after the circulation of the report and it was determined that there were few samples exceeding limits, e.g. 4 for RON, 2 for MON out of 140 samples. This was carried out by an independent body at retail outlets and analysis was done by an independent testing agency so these results are considered accurate. The Ministry of Environment is drafting new legislation which will provide for random sampling carried out at production sites, as well as at the point of sale.

10.2.2 Petrol reporting

Sampling

Summer Period: Normal: 1st May to 30th September

Number of samples: 225

Frequency of sampling: Monthly

Reporting

Fuel grades: 1

Parameters: All parameters were measured.

Other:

Exceedances of Directive 98/70/EC limit values

1. Petrol

Detail:	Individual samples exceeded the variety of different parameter limit values: RON, MON, vapour pressure, evaporation at 100C, olefins, aromatics, oxygenates, sulphur content.
Statistical significance:	Some of these samples were outside of the zone of tolerance for the test methods and were therefore noncompliant with the Directive. Details on the number of samples exceeding are detailed below.
Member State's notes:	Few samples of petrol exceeded the relevant acceptance limit: RON (4 out of 223), MON (2 out of 224), summer paper pressure (2 out of 59), winter vapour pressure (1 out of 138), evaporated at 100 ^{o}C (3 out of 225), olefins (2 out of 225), oxygen content (1 out of 221), ethers containing 5 or more carbon atoms per molecule (1 out of 221) and sulphur content (1 out of 179).

10.2.3 Diesel reporting

Sampling

Number of samples:	241
Frequency of sampling:	Monthly between June 2001 and February 2002

Reporting

Fuel grades:	1
Parameters:	All parameters were measured
Other:	

Exceedances of Directive 98/70/EC limit values

1. Diesel

Detail:	Some samples exceeded the limits for Cetane number (51.0 min.), and distillation 95% point (360 C), with the greatest exceedances being 49.0 and 367 C respectively.
Statistical significance:	The values for Cetane were within the zones of tolerance and therefore could not be stated to be noncompliant with the Directive. Details of exceedances of the distillation 95% point are below.
Member State's notes:	6 samples of diesel fuel exceeded the acceptance limit value for distillation (6 out of 240).

10.3 TEMPORAL TRENDS

The following Figures 10.2 to 10.4 show the 5 year trend in Fuel Quality Monitoring reporting in terms of total fuel sales and low sulphur fuel sales as a proportion of total sales. Because this was the first year of reporting, there were no particular comments to be made.

Figure 10.2: Temporal Trends in National Sales of Petrol and Diesel (million litres)

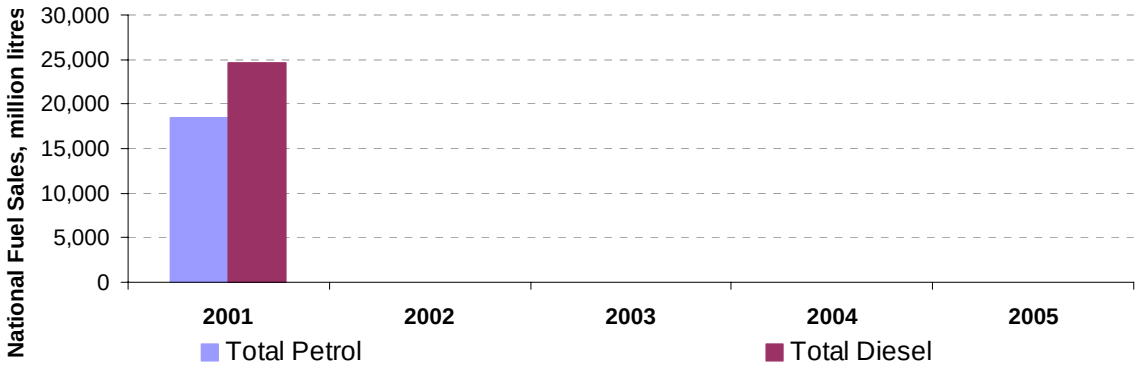


Figure 10.3: Temporal Trends in National Sales Proportions of Low Sulphur Petrol (%)

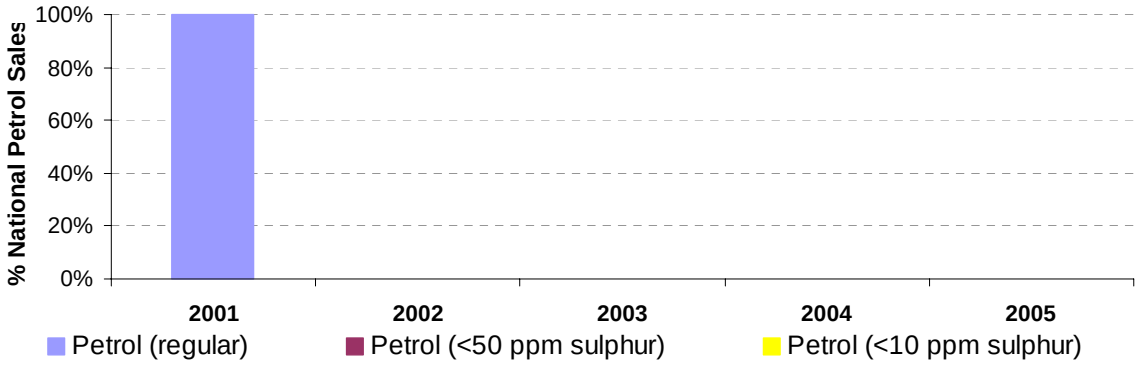
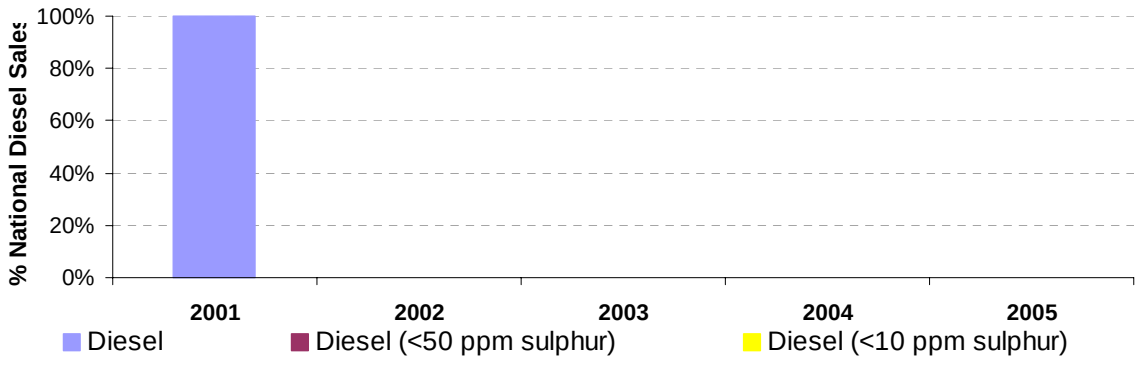


Figure 10.4: Temporal Trends in National Sales Proportions of Low Sulphur Diesel (%)



11 Luxembourg

11.1 FUEL AVAILABILITY 2001

The following table lists the fuels that were reported to be available nationally in 2001, whether full sales data was provided and the category (the reference number) under which sampling measurements were reported.

Ref. No.	Fuel grade	Sulphur Content	National fuel grade	Sales Data Availability	Reporting Category
1	Petrol min. RON = 91	Regular	-	Yes	Data not supplied
4	Petrol min. RON = 95	Regular	Essence Eurosuper RON 95	Yes	4
10	Petrol RON > = 98	Regular	Essence super plus RON 98	Yes	10
11		< 50 ppm	Essence super plus RON 98 (< 50 ppm)	Yes	10
13	Diesel Fuel	Regular	Diesel	Yes	13

11.1.1 Sales

Figure 11.1: National Fuel sales proportions by fuel type (%)

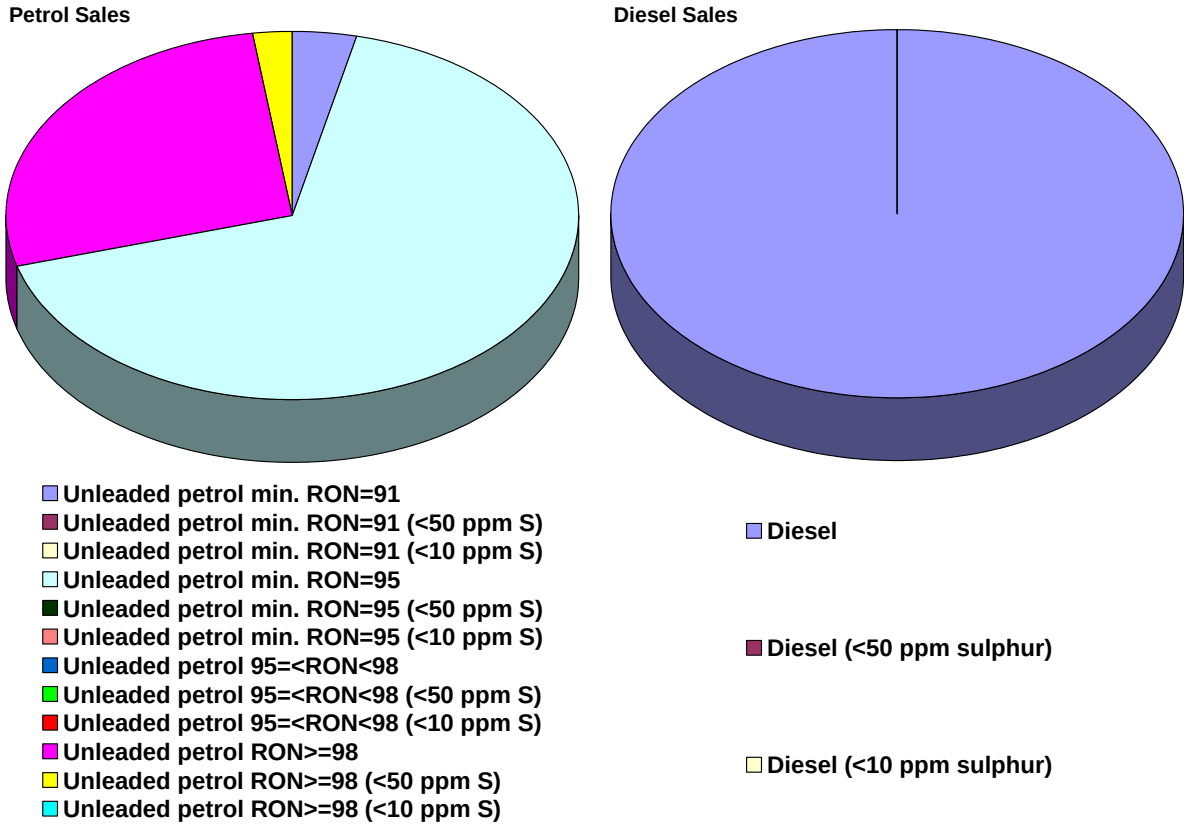


Figure 11.1 shows that the majority (67%) of Luxembourg's petrol sales in 2001 were of RON95 grade, with the remainder comprising of RON91 (4%), RON>98 (27%) and RON>98, <50 ppm sulphur (2%). No low sulphur diesel grades were available in 2001.

11.1.2 Sulphur content

Geographic availability of sulphur-free fuels: none on sale in 2001

Average sulphur content of all petrol sold: 18 ppm

Average sulphur content of all diesel sold: 252 ppm

[Average sulphur content is calculated from the mean sulphur content from reporting on the sampled fuels, weighted to the quantities of different petrol or diesel fuel grades sold].

11.2 FUEL QUALITY MONITORING 2001

11.2.1 Description of system

Responsible organisation(s): Luxembourg Environment Agency

Location(s) of sampling: all fuels were imported and Fuel importers were required to provide analysis of the fuels by unauthorised laboratory.

Time/frequency of sampling: data is sent to the Luxembourg Environment Agency every six months

Number of samples taken: 11 Petrol and 4 Diesel

Specification of test methods: no information provided.

Collection of sales data: from the fuel importers

Other details: only some of the fuel importers answered by sending analysis data in 2001. As far as possible a complete data set will be prepared for 2002.

11.2.2 Petrol reporting

Sampling

Summer Period: Normal: 1st May to 30th September

Number of samples: 11

Frequency of sampling: Periodically covering both summer and winter periods

Reporting

Fuel grades: Four Fuel grades were on sale, however analysis data was only presented for three grades in separate tables (RON91 is omitted).

Parameters: Olefins, aromatics, oxygen content and all oxygenates were not measured.

Other:

Exceedances of Directive 98/70/EC limit values

None.

11.2.3 Diesel reporting

Sampling

Number of samples: 4

Frequency of sampling: Quarterly

Reporting

Fuel grades: 1 fuel grade available

Parameters: All parameters except PAH were measured.

Other:

Exceedances of Directive 98/70/EC limit values

1. Diesel

Detail: 1 sample exceeded the maximum distillation point (360 C.), with 360.5 C.

Statistical significance: Insufficient information was available to indicate whether this was within the zone of tolerance for the test methods (373 C), and therefore compliance with the Directive could not be confirmed.

Member State's notes: None.

11.3 TEMPORAL TRENDS

The following Figures 11.2 to 11.4 show the 5 year trend in Fuel Quality Monitoring reporting in terms of total fuel sales and low sulphur fuel sales as a proportion of total sales. Because this was the first year of reporting, there were no particular comments to be made.

Figure 11.2: Temporal Trends in National Sales of Petrol and Diesel (million litres)

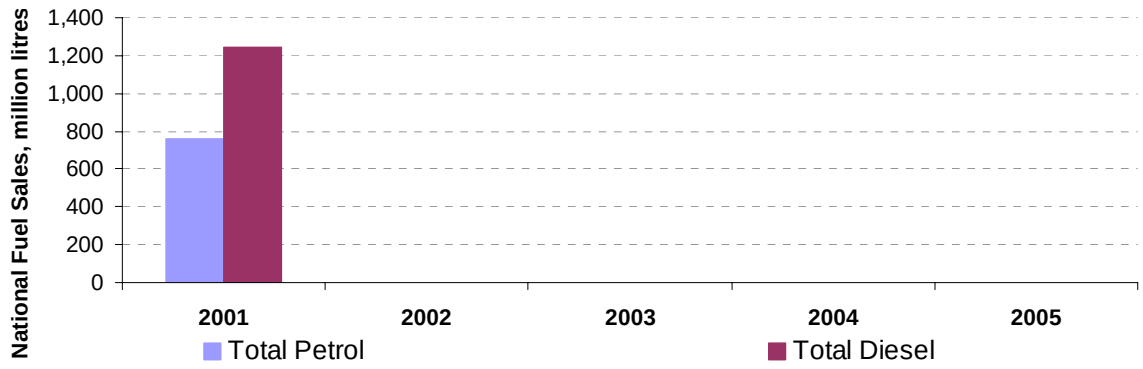


Figure 11.3: Temporal Trends in National Sales Proportions of Low Sulphur Petrol (%)

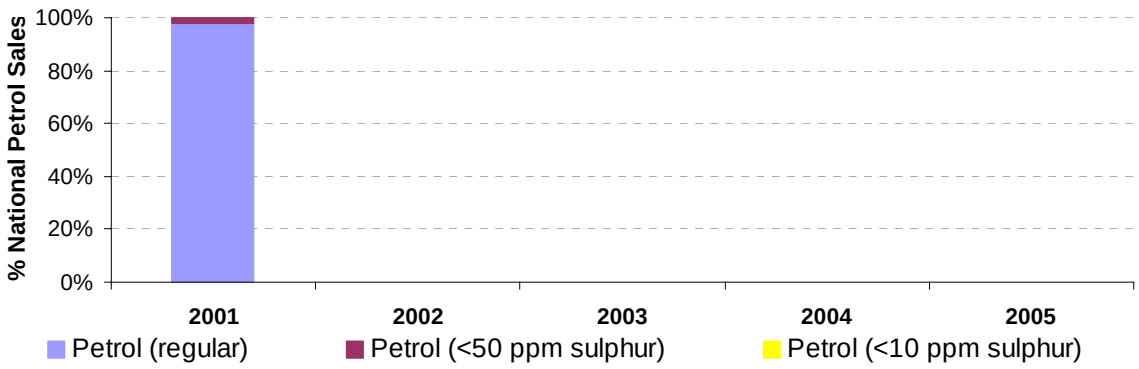
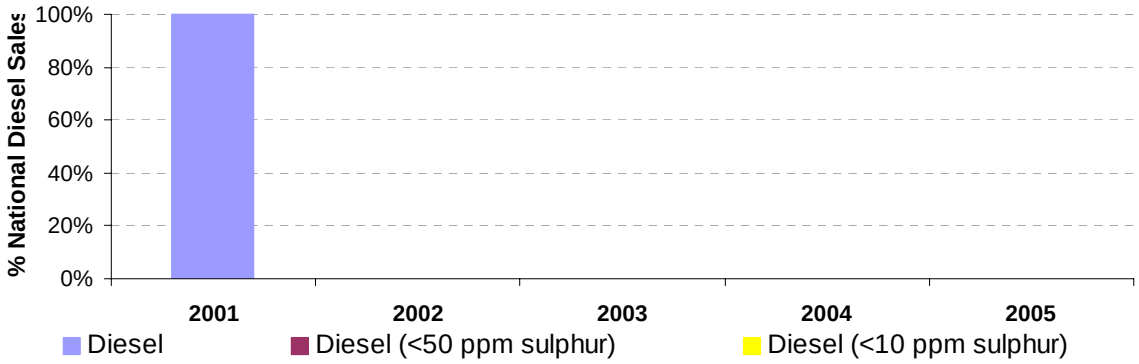


Figure 11.4: Temporal Trends in National Sales Proportions of Low Sulphur Diesel (%)



12 Netherlands

12.1 FUEL AVAILABILITY 2001

The following table lists the fuels that were reported to be available nationally in 2001, whether full sales data was provided and the category (the reference number) under which sampling measurements were reported.

Ref. No.	Fuel grade	Sulphur Content	National fuel grade	Sales Data Availability	Reporting Category
4	Petrol min. RON = 95	Regular	-	Yes	4
10	Petrol RON > = 98	Regular	-	Yes	4
13	Diesel Fuel	Regular	-	Yes	13
14	Diesel Fuel	< 50 ppm	-	Yes	13

12.1.1 Sales

Figure 2.1: National Fuel sales proportions by fuel type (%)

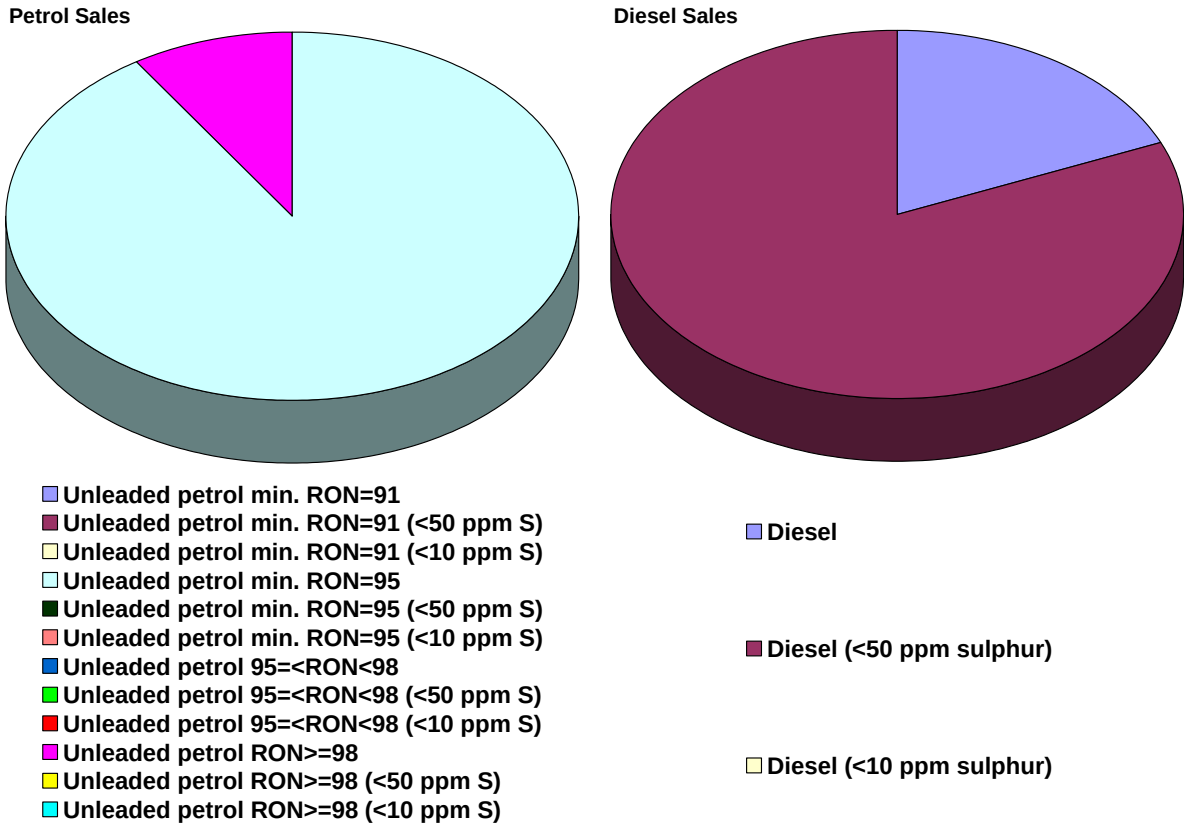


Figure 12.1 shows that 91% of petrol sold in The Netherlands in 2001 was of regular RON95 grade, with the remainder being RON>98. Although no low sulphur (<50 ppm) petrol was marketed in 2001, 81% of diesel sales were of low sulphur grades.

12.1.2 Sulphur content

Geographic availability of sulphur-free fuels: not available in 2001.

Average sulphur content of all petrol sold: 51 ppm

Average sulphur content of all diesel sold: 42.3 ppm

[Average sulphur content is calculated from the mean sulphur content from reporting on the sampled fuels, weighted to the quantities of different petrol or diesel fuel grades sold].

12.2 FUEL QUALITY MONITORING 2001

12.2.1 Description of system

Responsible organisation(s): Inspectorate for Environmental Health

Location(s) of sampling: a variety of refuelling stations across the Netherlands.

Time/frequency of sampling: sampling was carried out monthly from January to April 2001

Number of samples taken: 23 petrol and 19 diesel

Specification of test methods: no information provided

Collection of sales data: no information provided

Other details:

12.2.2 Petrol reporting

Sampling

Summer Period:	Normal: 1st May to 30th September
Number of samples:	23
Frequency of sampling:	Monthly between January and April

Reporting

Fuel grades:	Two petrol grades reported in the combined table
Parameters:	All parameters except vapour pressure and oxygen content were measured in 2001.
Other:	The Netherlands provided information on 2002 measurements of vapour pressure (range: 53.1 to 59.1 kPa, against a limit of 60.0) and oxygen content (range: 0 to 1.3 %m/m, against a limit of 2.7).

Exceedances of Directive 98/70/EC limit values

1. Petrol

Detail: In 1 sample the aromatics content exceeded the limit (42.0 %(v/v)), with 44.8 %(v/v).

Statistical significance: This sample was outside of the zone of tolerance for this parameter test method (44.1 %(v/v)) and was therefore noncompliant with the Directive.

Member State's notes: None provided.

12.2.3 Diesel reporting

Sampling

Number of samples: 19

Frequency of sampling: Monthly between January and April 2001

Reporting

Fuel grades: 2 grades with measurements reported in a single table

Parameters: All parameters were measured.

Other:

Exceedances of Directive 98/70/EC limit values

None.

12.3 TEMPORAL TRENDS

The following Figures 12.2 to 12.4 show the 5 year trend in Fuel Quality Monitoring reporting in terms of total fuel sales and low sulphur fuel sales as a proportion of total sales. Because this was the first year of reporting, there were no particular comments to be made.

Figure 12.2: Temporal Trends in National Sales of Petrol and Diesel (million litres)

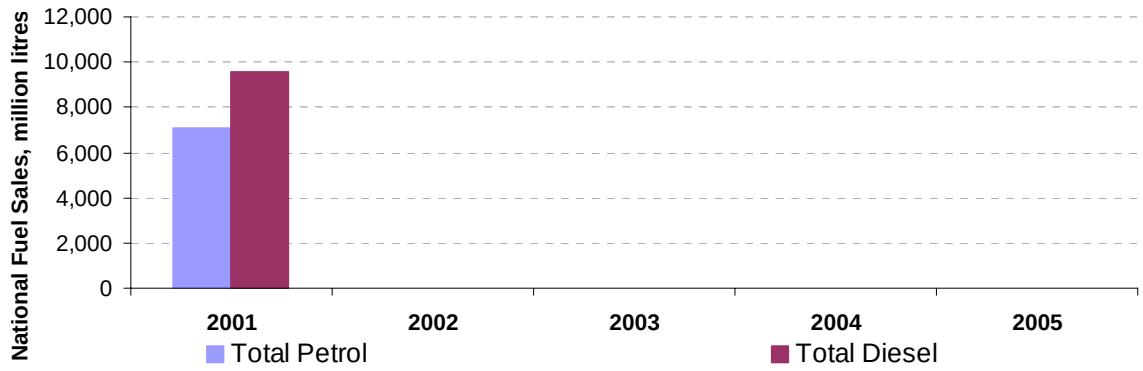


Figure 12.3: Temporal Trends in National Sales Proportions of Low Sulphur Petrol (%)

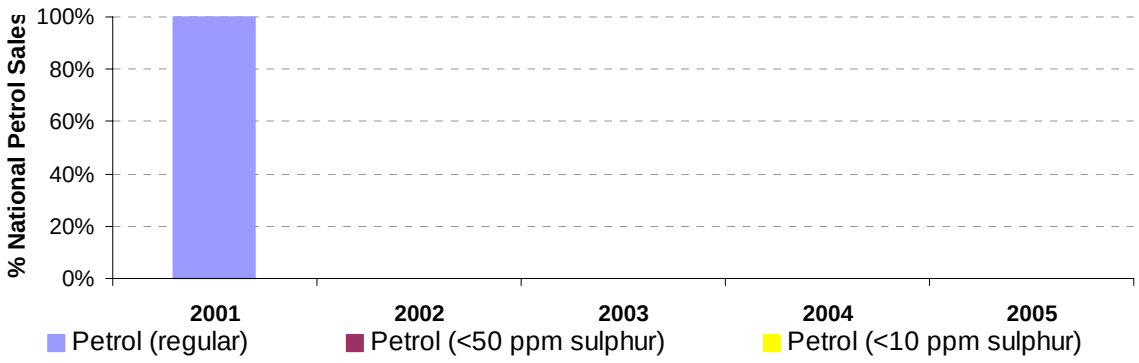
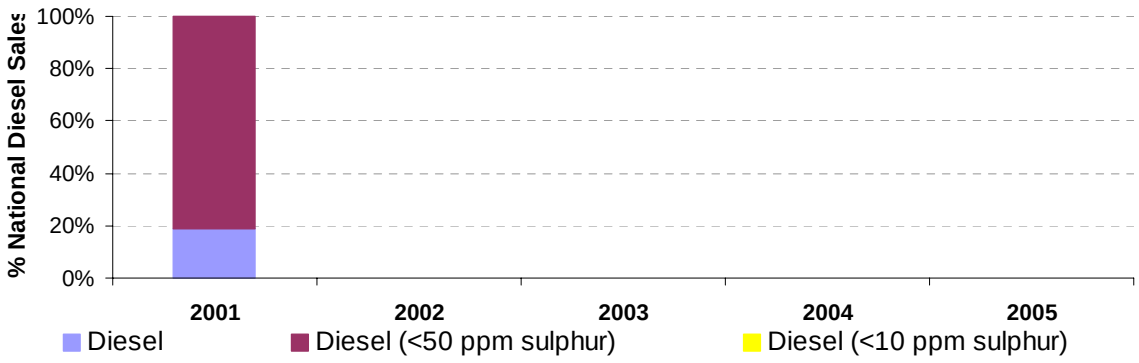


Figure 12.4: Temporal Trends in National Sales Proportions of Low Sulphur Diesel (%)



13 Portugal

13.1 FUEL AVAILABILITY 2001

The following table lists the fuels that were reported to be available nationally in 2001, whether full sales data was provided and the category (the reference number) under which sampling measurements were reported.

Ref. No.	Fuel grade	Sulphur Content	National fuel grade	Sales Data Availability	Reporting Category
7	Petrol 95 = < RON < 98	Regular	-	Yes	7
10	Petrol RON > = 98	Regular	-	Yes	10
13	Diesel Fuel	Regular	-	Yes	13

13.1.1 Sales

Figure 13.1: National Fuel sales proportions by fuel type (%)

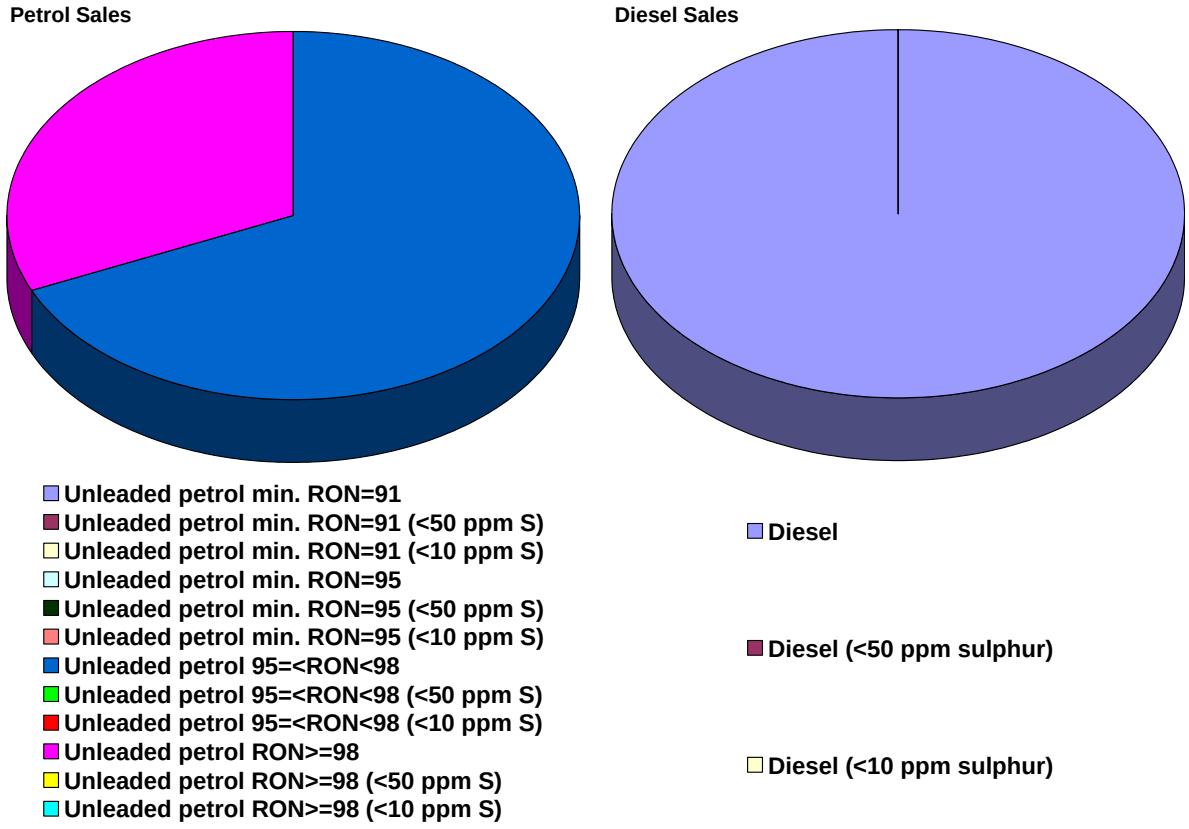


Figure 13.1 shows that of the fuel marketed in 2001 in Portugal, none was of low sulphur (<50 ppm) grade. The majority (68%) of petrol grades were RON95-98, with the remainder being at RON>98.

13.1.2 Sulphur content

Geographic availability of sulphur-free fuels: not available in 2001.

Average sulphur content of all petrol sold: 447 ppm

Average sulphur content of all diesel sold: 272 ppm

[Average sulphur content is calculated from the mean sulphur content from reporting on the sampled fuels, weighted to the quantities of different petrol or diesel fuel grades sold].

13.2 FUEL QUALITY MONITORING 2001

13.2.1 Description of system

Responsible organisation(s): DGE

Location(s) of sampling: The companies themselves carry out tests, taking samples in the refineries and terminals, and randomly across the country in retail sites.

Time/frequency of sampling: Roughly monthly throughout the year.

Number of samples taken: 17 petrol 95=<RON<98, 20 petrol RON>98 and 96 diesel

Specification of test methods: Methods specified in Directive 98/70/EC

Collection of sales data: The information is compiled in electronic format by the fuel companies, who send it to DGE.

Other details: Two refineries supply the market, one of them in the north and the other in the south. Imported fuels consist of 942 tonnes diesel. The same methodology will be followed for the 2002 report, however Portugal is studying alternative methodologies, in order to comply with EN14274 in the future.

13.2.2 Petrol reporting

Sampling

Summer Period: Normal: 1st May to 30th September

Number of samples: 37

Frequency of sampling: Roughly monthly

Reporting

Fuel grades:	2 grades were available, measurements were reported separately and separate measurements were reported for summer and winter sampling.
Parameters:	All parameters were measured, except oxygenates other than ethers containing five or more carbon atoms per molecule.
Other:	Portugal had a derogation for the sulphur content in Petrol until the 31st December 2001, given by the European Commission. No other oxygenates other than ethers were added.

Exceedances of Directive 98/70/EC limit values

1. Petrol RON 98

Detail:	1 sample exceeded the summer vapour pressure limit values (60 kPa), with 77.7 kPa.
Statistical significance:	This sample fell outside of the zone of tolerance (62.9 kPa), and was therefore noncompliant with the Directive.
Member State's notes:	The reason for non-compliance is currently being reviewed.

Exceedances of Directive 98/70/EC limit values

1. Petrol 95 < RON < 98

Detail:	1 sample exceeded the summer vapour pressure limit values (60 kPa), with 79.3 kPa.
Statistical significance:	This sample fell outside of the zone of tolerance (62.9 kPa), and was therefore noncompliant with the Directive.
Member State's notes:	The reason for non-compliance is currently being reviewed.

13.2.3 Diesel reporting

Sampling

Number of samples:	96
Frequency of sampling:	Monthly

Reporting

Fuel grades:	1
Parameters:	All parameters were measured.
Other:	

Exceedances of Directive 98/70/EC limit values

None.

13.3 TEMPORAL TRENDS

The following Figures 13.2 to 13.4 show the 5 year trend in Fuel Quality Monitoring reporting in terms of total fuel sales and low sulphur fuel sales as a proportion of total sales. Because this was the first year of reporting, there were no particular comments to be made.

Figure 13.2: Temporal Trends in National Sales of Petrol and Diesel (million litres)

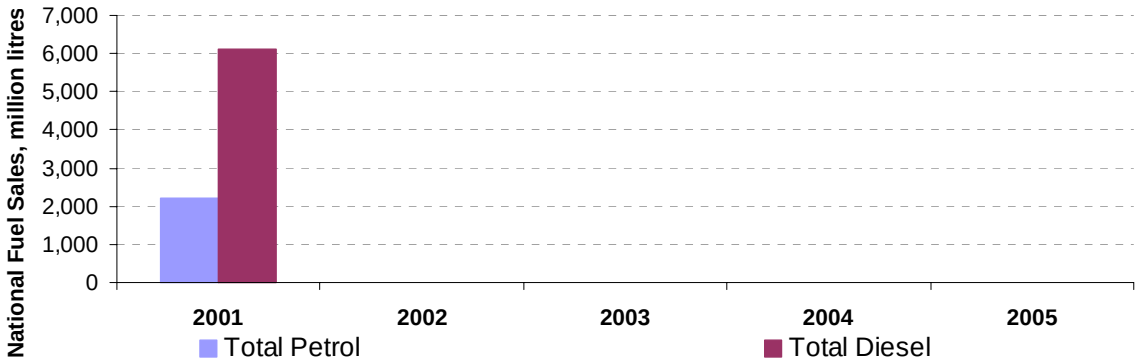


Figure 13.3: Temporal Trends in National Sales Proportions of Low Sulphur Petrol (%)

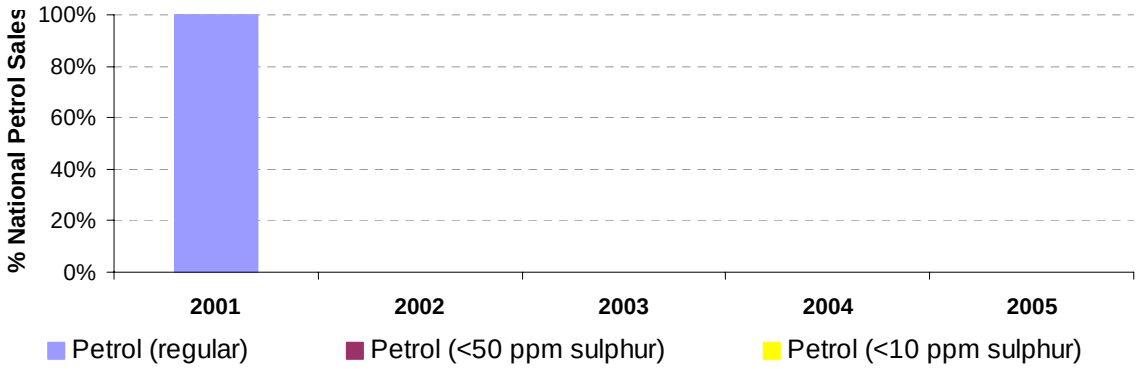
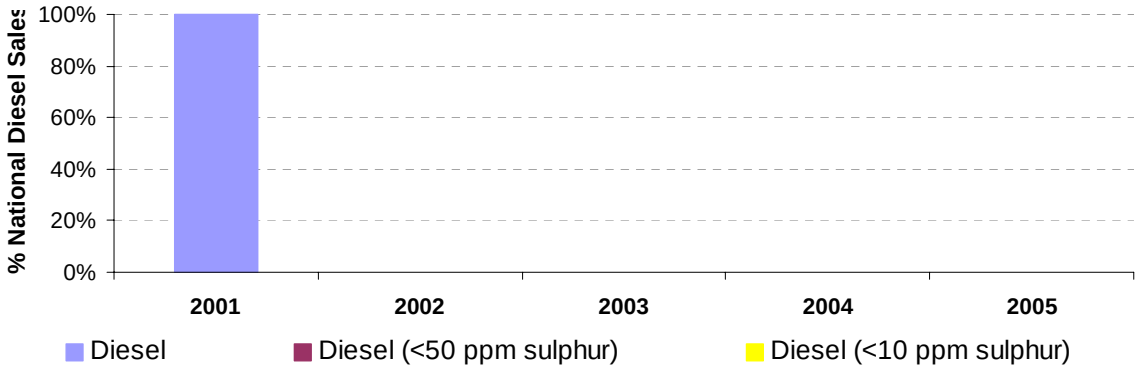


Figure 13.4: Temporal Trends in National Sales Proportions of Low Sulphur Diesel (%)



14 Spain

14.1 FUEL AVAILABILITY 2001

The following table lists the fuels that were reported to be available nationally in 2001, whether full sales data was provided and the category (the reference number) under which sampling measurements were reported.

Ref. No.	Fuel grade	Sulphur Content	National fuel grade	Sales Data Availability	Reporting Category
4	Petrol min. RON = 95	Regular	-	Yes	4
7	Petrol 95 = < RON < 98	Regular	-	Yes	7
10	Petrol RON > = 98	Regular	-	Yes	10
13	Diesel Fuel	Regular	-	Yes	13

14.1.1 Sales

Figure 14.1: National Fuel sales proportions by fuel type (%)

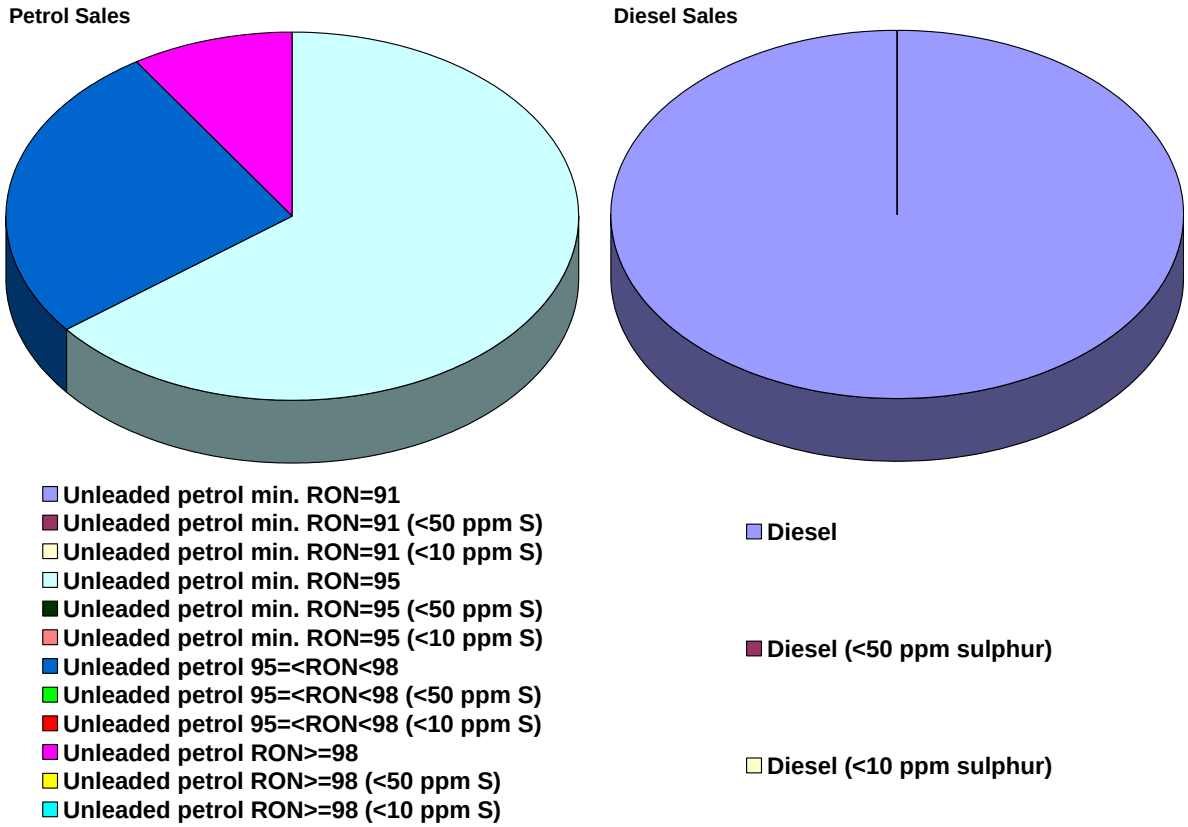


Figure 14.1 shows that the majority of fuel sold in Spain in 2001 was RON95 grade (64%), with the rest comprising of RON95-98 (26%) and RON>98 (9%). No low sulphur (<50 ppm) grades of fuel were available in Spain in 2001.

14.1.2 Sulphur content

Geographic availability of sulphur-free fuels: not available in 2001.

Average sulphur content of all petrol sold: 96 ppm

Average sulphur content of all diesel sold: 278 ppm

[Average sulphur content is calculated from the mean sulphur content from reporting on the sampled fuels, weighted to the quantities of different petrol or diesel fuel grades sold].

14.2 FUEL QUALITY MONITORING 2001

14.2.1 Description of system

Responsible organisation(s): Economy Ministry, Health & Consumer Ministry, C.L.H.S.A., National Consumer Institute.

Location(s) of sampling: fuel storage centres

Time/frequency of sampling: Monthly throughout the year

Number of samples taken: 465 petrol and 222 diesel

Specification of test methods: no information provided

Collection of sales data: no information provided.

Other details: None provided.

14.2.2 Petrol reporting

Sampling

Summer Period:	Normal: 1st May to 30th September
Number of samples:	495
Frequency of sampling:	Monthly throughout the year

Reporting

Fuel grades:	3 reported separately with separate reporting for summer and winter.
Parameters:	All parameters were measured
Other:	

Exceedances of Directive 98/70/EC limit values

1. Petrol RON 95

Detail: 3 samples exceed the maximum limit for oxygen content (2.7 %(m/m), with 3.0, 3.0 and 3.1 %m/m respectively.

Statistical significance: These were all outside of the zone of statistical tolerance for the test method and were therefore noncompliant with the Directive.

Member State's notes: None provided.

Exceedances of Directive 98/70/EC limit values

1. Petrol RON 97

Detail: 1 sample exceeded the maximum limit for oxygen content (2.7 %(m/m), with 3.1 %m/m.

Statistical significance: This was outside of the zone of statistical tolerance for the test method and therefore noncompliant with the Directive.

Member State's notes: None provided.

Exceedances of Directive 98/70/EC limit values

1. Petrol RON 98

Detail: 3 samples exceeded the maximum limit for oxygen content (2.7 %(m/m)), with 3.0 %(m/m) for all.

Statistical significance: This was outside of the zone of statistical tolerance for the test method and therefore noncompliant with the Directive.

Member State's notes: None provided.

14.2.3 Diesel reporting

Sampling

Number of samples: 222

Frequency of sampling: Monthly throughout the year

Reporting

Fuel grades: 1

Parameters: All parameters are measured

Other:

Exceedances of Directive 98/70/EC limit values

None.

14.3 TEMPORAL TRENDS

The following Figures 14.2 to 14.4 show the 5 year trend in Fuel Quality Monitoring reporting in terms of total fuel sales and low sulphur fuel sales as a proportion of total sales. Because this was the first year of reporting, there were no particular comments to be made.

Figure 14.2: Temporal Trends in National Sales of Petrol and Diesel (million litres)

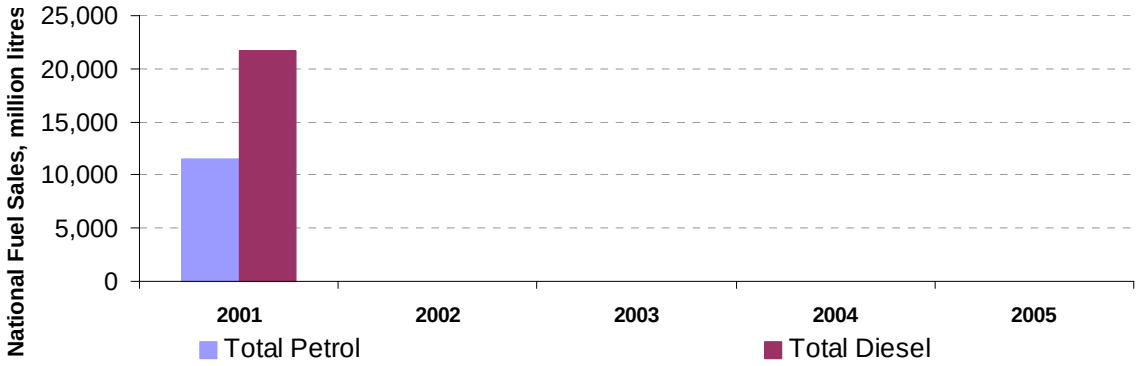


Figure 14.3: Temporal Trends in National Sales Proportions of Low Sulphur Petrol (%)

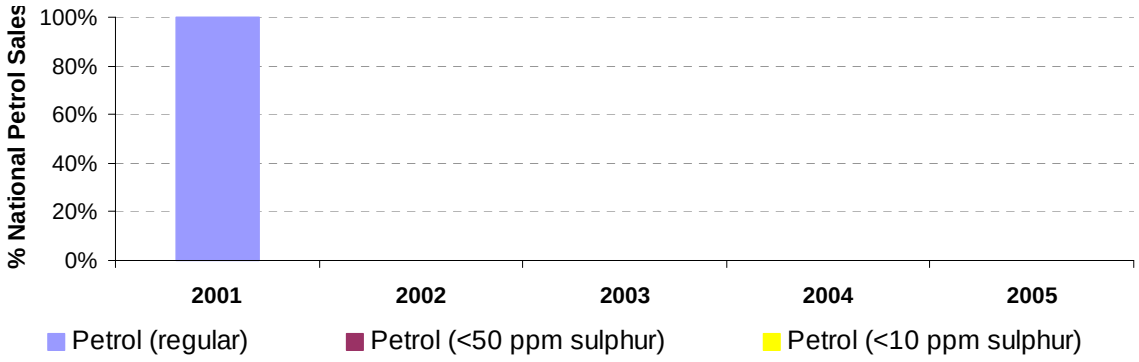
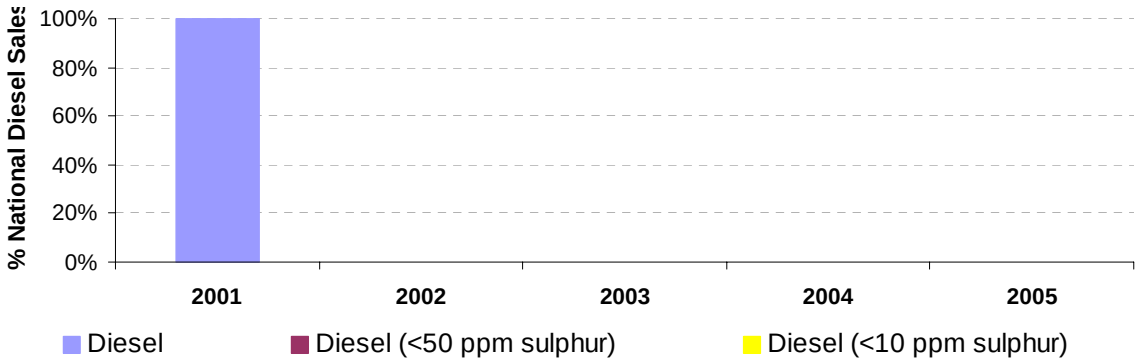


Figure 14.4: Temporal Trends in National Sales Proportions of Low Sulphur Diesel (%)



15 Sweden

15.1 FUEL AVAILABILITY 2001

The following table lists the fuels that were reported to be available nationally in 2001, whether full sales data was provided and the category (the reference number) under which sampling measurements were reported.

Ref. No.	Fuel grade	Sulphur Content	National fuel grade	Sales Data Availability	Reporting Category
5	Petrol min. RON = 95	< 50 ppm	95 Oktan	Yes	5
10	Petrol RON > = 98	Regular	98 Oktan	Yes	10
15	Diesel Fuel	< 10 ppm	Diesel	Yes	15

15.1.1 Sales

Figure 15.1: National Fuel sales proportions by fuel type (%)

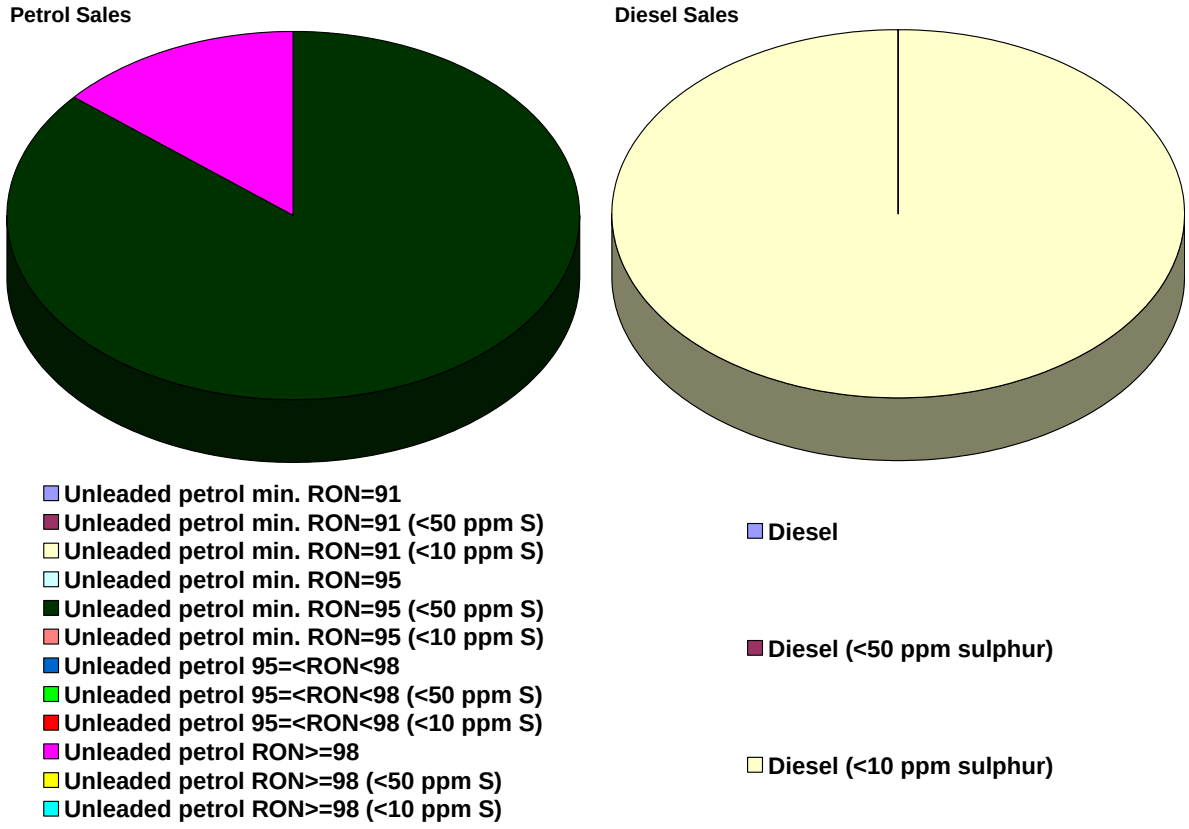


Figure 15.1 shows that the vast majority of fuel sold in Sweden in 2001 was low (<50 ppm) or zero (<10 ppm) sulphur. 86% of petrol sold was low sulphur and all diesel sold was zero sulphur grade.

15.1.2 Sulphur content

Geographic availability of sulphur-free fuels: Sulphur-free diesel fuel is available throughout the country. As early as 1996, 85% of all diesel fuel sold was sulphur-free and for the last two years virtually all diesel sold was sulphur-free.

Average sulphur content of all petrol sold: 21 ppm

Average sulphur content of all diesel sold: 1 ppm

[Average sulphur content is calculated from the mean sulphur content from reporting on the sampled fuels, weighted to the quantities of different petrol or diesel fuel grades sold].

15.2 FUEL QUALITY MONITORING 2001

15.2.1 Description of system

Responsible organisation(s): Swedish Environmental Protection Agency

Location(s) of sampling: All consignments of fuel to be delivered to market are analysed in order to provide a Certificate of Quality (CQ). In addition, as part of the quality control systems of Swedish oil companies, analysis was carried out on a large proportion of the fuel that was delivered to depots, including sensitive parameters to detect for contamination.

Time/frequency of sampling: all year round - see above.

Number of samples taken: 939 petrol and 638 diesel

Specification of test methods: analysing laboratories are accredited by SWEDAC (Swedish Board for Accreditation and Conformity Assessment), however no information was provided on the test methods themselves.

Collection of sales data: no information provided.

Other details:

15.2.2 Petrol reporting

Sampling

Summer Period:	Arctic: 1st June to 31st August
	(National period: Gotaland and Sveland (<61 degrees N): 1 May-15 September, Norrland (>61 degrees N): 16 May-31 August)
Number of samples:	939
Frequency of sampling:	Throughout the year

Reporting

Fuel grades:	2 reported in separate tables
Parameters:	All parameters except all oxygenates other than ethanol and ethers with 5 or more carbon atoms per molecule.
Other:	

Exceedances of Directive 98/70/EC limit values

1. Petrol

Detail:	It was unclear on the basis of the information provided as to whether the summer vapour pressure limits (60) were exceeded, as data was reported together. Some samples were above the summer limit, however these may have been taken outside of the summer period when it applies.
Statistical significance:	See comments above.
Member State's notes:	Sweden confirmed that none of the samples from the summer period exceeded the limit values.

15.2.3 Diesel reporting

Sampling

Number of samples:	638
Frequency of sampling:	Throughout the year

Reporting

Fuel grades:	1
Parameters:	All parameters were measured.
Other:	

Exceedances of Directive 98/70/EC limit values

1. Diesel

Detail:	An unknown number of samples did not meet the minimum Cetane Number limit value (51) with the lowest being 50.
Statistical significance:	This was within the range of tolerance for the test method (48.4) and therefore the samples could not be said to be noncompliant with the Directive.
Member State's notes:	None provided.

15.3 TEMPORAL TRENDS

The following Figures 15.2 to 15.4 show the 5 year trend in Fuel Quality Monitoring reporting in terms of total fuel sales and low sulphur fuel sales as a proportion of total sales. Because this was the first year of reporting, there were no particular comments to be made.

Figure 15.2: Temporal Trends in National Sales of Petrol and Diesel (million litres)

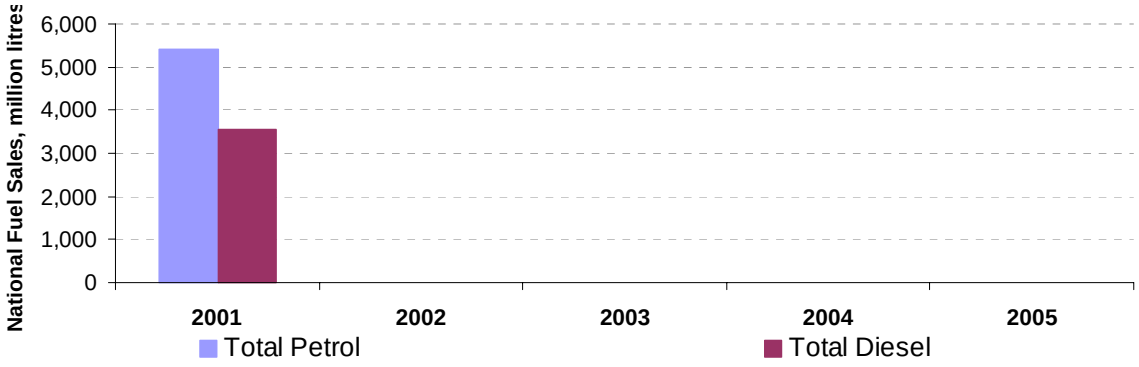


Figure 15.3: Temporal Trends in National Sales Proportions of Low Sulphur Petrol (%)

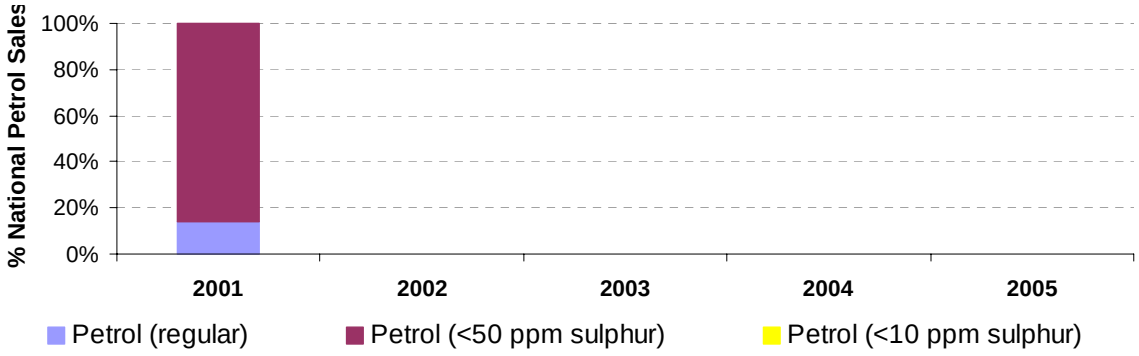
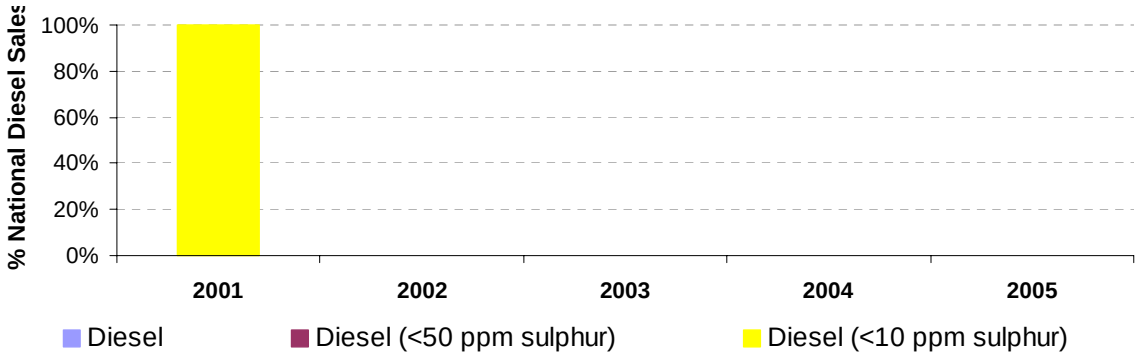


Figure 15.4: Temporal Trends in National Sales Proportions of Low Sulphur Diesel (%)



16 United Kingdom

16.1 FUEL AVAILABILITY 2001

The following table lists the fuels that were reported to be available nationally in 2001, whether full sales data was provided and the category (the reference number) under which sampling measurements were reported.

Ref. No.	Fuel grade	Sulphur Content	National fuel grade	Sales Data?	Reporting Category
4	Petrol min. RON = 95	Regular	Premium Unleaded	Yes	4
5	Petrol min. RON = 95	< 50 ppm	ULS Premium Unleaded	No	4
7	Petrol 95 = < RON < 98	Regular	Super Unleaded	Yes	7
14	Diesel	< 50 ppm	ULS Diesel	Yes	14

16.1.1 Sales

Figure 16.1: National Fuel sales proportions by fuel type (%)

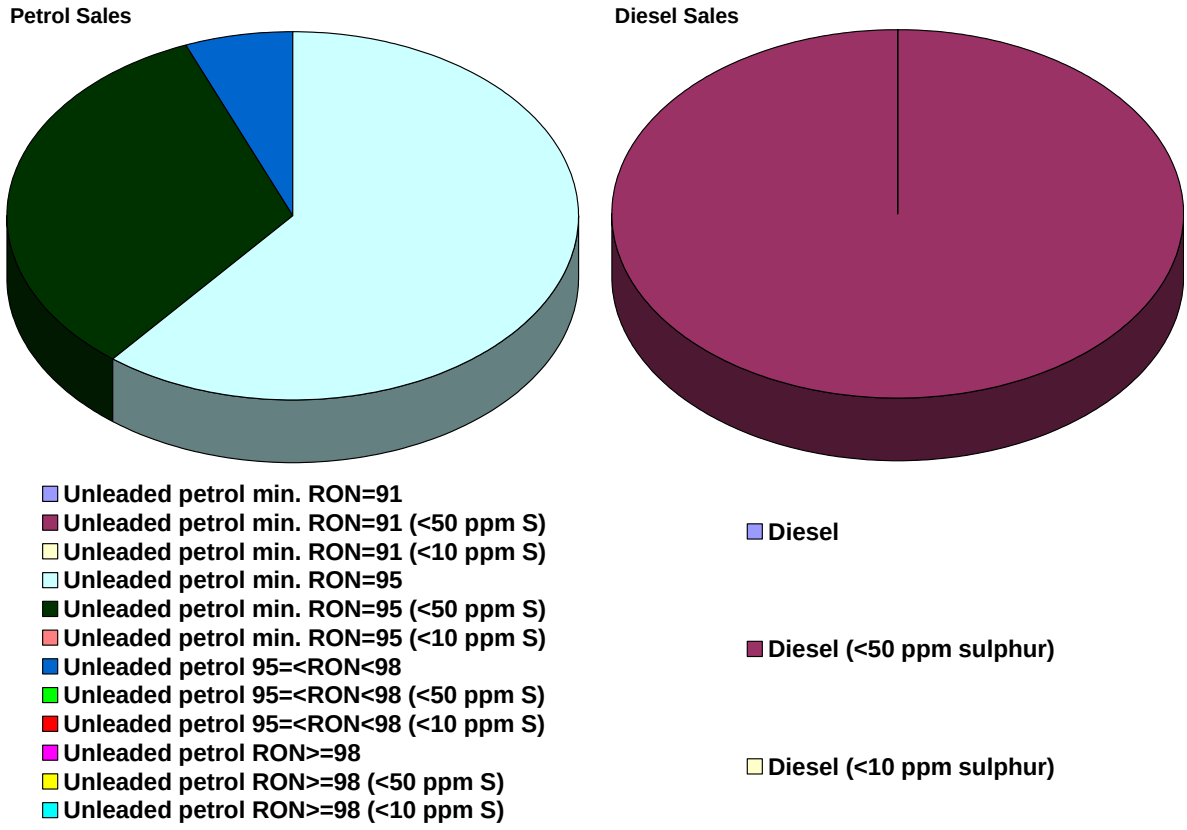


Figure 16.1 above shows the wide availability of low sulphur (<50 ppm) fuels on the UK market in 2001, with 100% of all diesel fuel sold being low sulphur and 28% (estimated by UK DTI) of all petrol sold being low sulphur. Premium unleaded petrol (regular, max. 150 ppm sulphur) accounted for 66% of all petrol sold in 2001.

16.1.2 Sulphur content

Geographic availability of sulphur-free fuels: None available in 2001.

Average sulphur content of all petrol sold: 49 ppm

Average sulphur content of all diesel sold: 40 ppm

[Average sulphur content is calculated from the mean sulphur content from reporting on the sampled fuels, weighted to the quantities of different petrol or diesel fuel grades sold].

16.2 FUEL QUALITY MONITORING 2001

16.2.1 Description of system

Responsible organisation(s): Department for Trade and Industry (DTI), United Kingdom Petroleum Industry Association (UKPIA) and Association of UK Oil Independents (AUKOI).

Location(s) of sampling: Each UK refinery and import terminal tests all fuels prior to release into the UK market. Individual companies send results to the relevant trade organisation (UKPIA or AUKOI), who compile and send it on to DTI.

Time/frequency of sampling: Every batch of fuel manufactured in refineries for consumption in the UK is tested. Oil marketers also conduct surveys to confirm that fuel is not contaminated in transport. This consists of sampling at inland terminals plus their own and competitors retail networks.

Number of samples taken: 2530 petrol and 1772 diesel

Specification of test methods: Testing carried out in NAMAS/ISO 9000 accredited laboratories.

Collection of sales data: Sales data is collected by industry and sent to DTI.

Other details: 9 refineries supply the market of the UK with fuel by the major international oil companies and this is supplemented by imports controlled by independent suppliers (<10% total fuels within UK). No product is released that does not meet the limit values in Directive 98/70/EC.

In the UK criminal elements sometimes remove the die from red diesel and market it as road diesel to avoid tax. Other samples taken for the purpose of checking this behaviour are not suitable for fuel quality monitoring.

16.2.2 Petrol reporting

Sampling

Summer Period: Arctic: 1st June to 31st August

Number of samples: 2530

Frequency of sampling: Throughout the year

Reporting

Fuel grades: 4; with premium unleaded and premium unleaded <50 ppm S reported in combined table and Super Unleaded and Lead Replacement Petrol recorded together also.

Parameters: All parameters were measured.

Other:

Exceedances of Directive 98/70/EC limit values

None.

16.2.3 Diesel reporting

Sampling

Number of samples: 1772

Frequency of sampling: Throughout the year

Reporting

Fuel grades: 1

Parameters: All parameters measured

Other:

Exceedances of Directive 98/70/EC limit values

None.

16.3 TEMPORAL TRENDS

The following Figures 16.2 to 16.4 show the 5 year trend in Fuel Quality Monitoring reporting in terms of total fuel sales and low sulphur fuel sales as a proportion of total sales. Because this was the first year of reporting, there were no particular comments to be made.

Figure 16.2: Temporal Trends in National Sales of Petrol and Diesel (million litres)

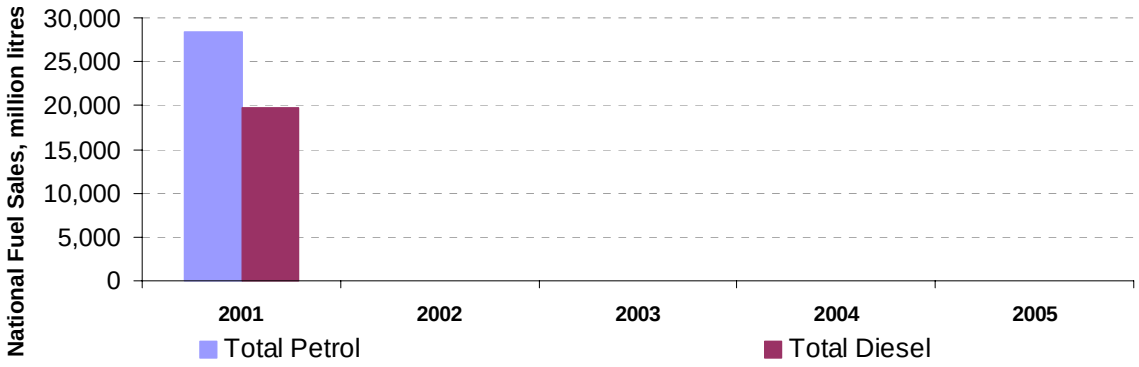


Figure 16.3: Temporal Trends in National Sales Proportions of Low Sulphur Petrol (%)

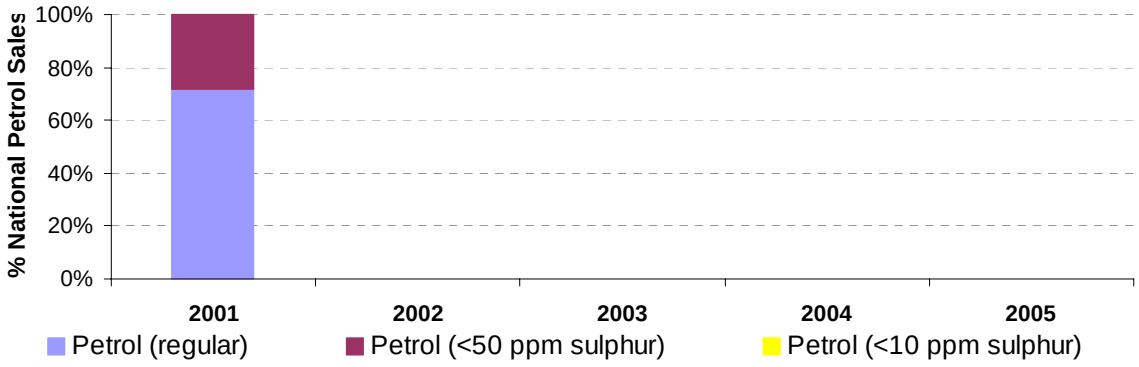
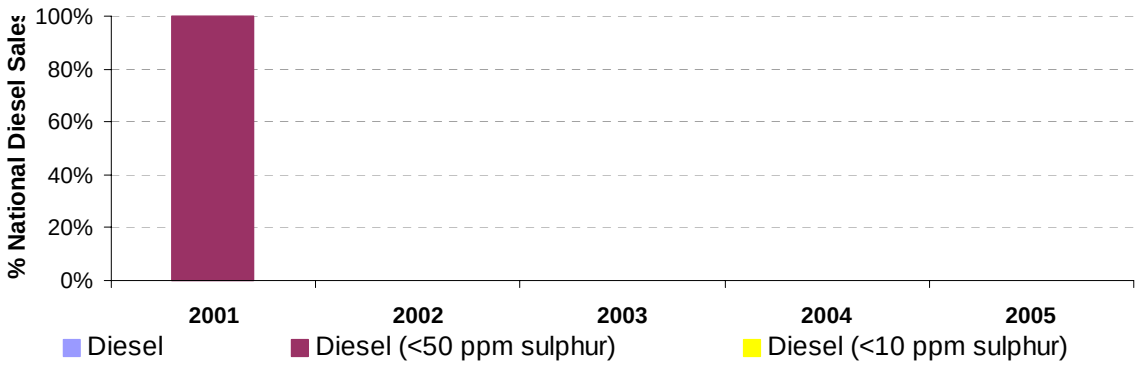


Figure 16.4: Temporal Trends in National Sales Proportions of Low Sulphur Diesel (%)



17 EU Summary

17.1 FUEL AVAILABILITY 2001

17.1.1 Sales

Figure 17.1: EU Fuel sales proportions by fuel type (%)

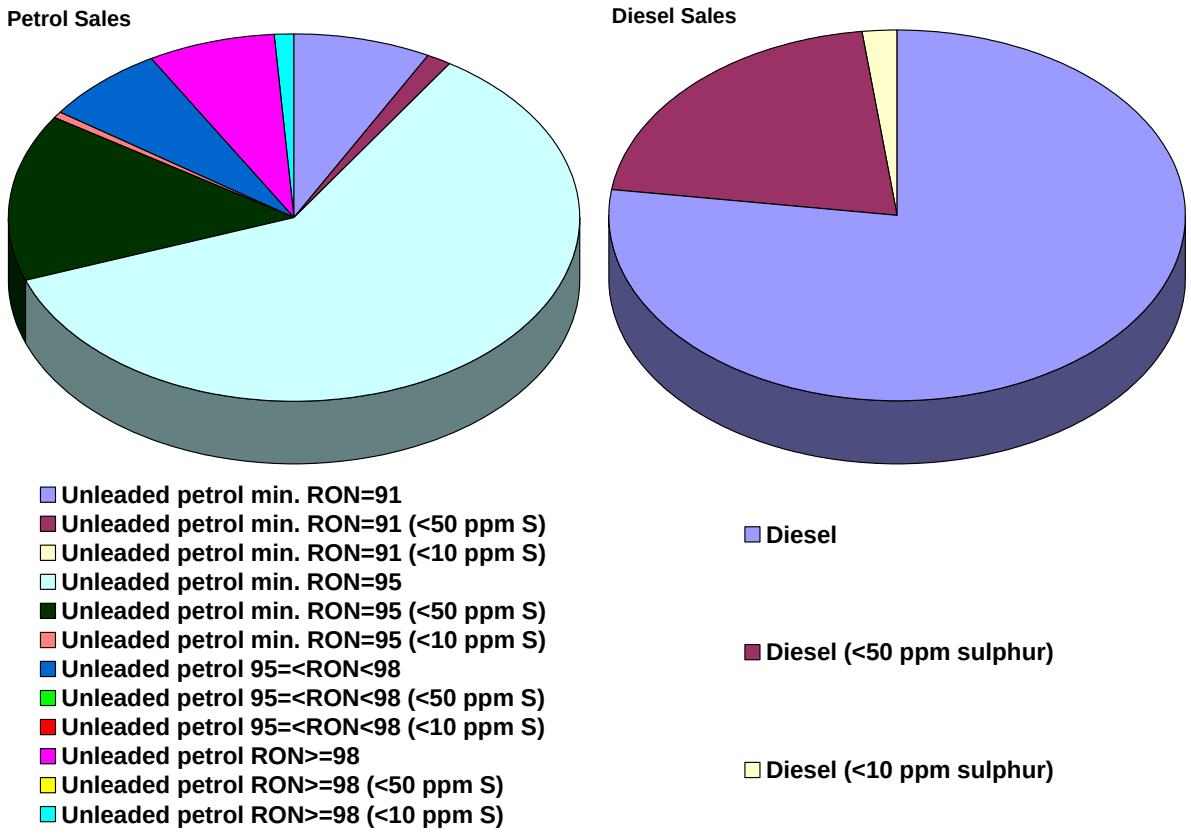
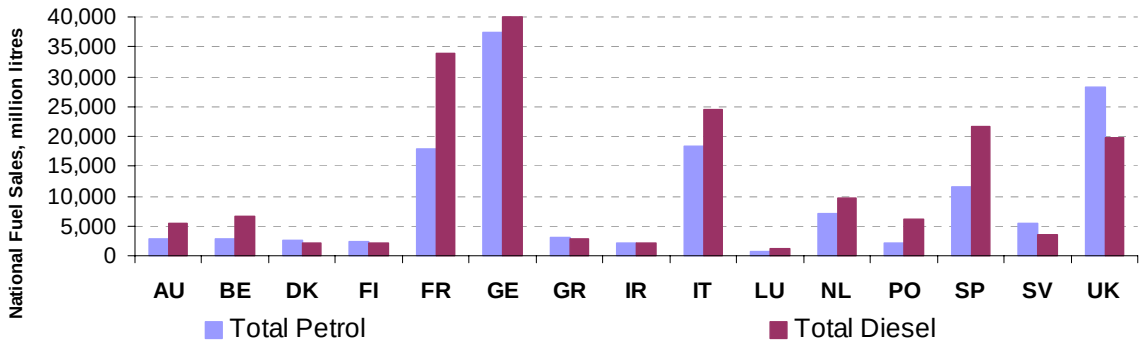


Figure 17.1 shows that in 2001, whilst a wide variety of RON and sulphur grade fuels were available across the EU, the majority of sales comprised of RON95 (76%, with 60% regular, 15% low sulphur and 1% zero sulphur). Of all petrol sold, 83% was regular sulphur grade, 15% low sulphur (<50 ppm) and 2% sulphur free (<10 ppm). Of all diesel sold the equivalent split was 77%, 21% and 2%.

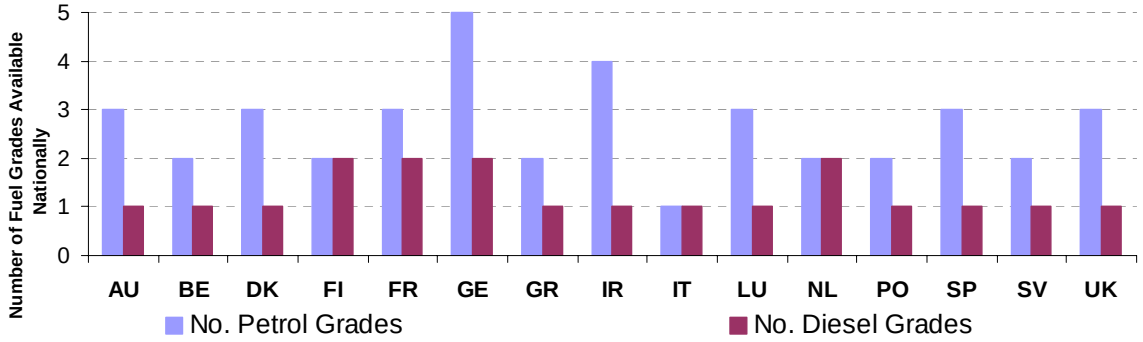
Figure 17.2: National Fuel sales by fuel type across the EU (million litres)



Unsurprisingly the largest total sales of fuels in 2001 were made in France, Germany, Italy, Spain and the United Kingdom (Figure 17.2). Whilst diesel sales are dominant in many Member States, it is interesting to note the variations in relative sales of petrol and diesel. In France and United Kingdom the differences are particularly pronounced, with diesel sales in France being almost double those of petrol and diesel sales being almost 30% less than petrol in the United Kingdom.

There is also a variation in the number of grades of fuel reported to be available across the EU (Figure 17.3) in 2001, with clearly more petrol grades available, despite the larger quantities of diesel sold. It also appears that only four Member States have actually defined *national fuel grades* for low (<50 ppm) or zero (<10 ppm) fuels (Austria, Germany, Luxembourg and Sweden). Other Member States have either left the availability of low or zero sulphur fuels simply to market conditions, or provided some form of incentive to encourage market change (e.g. the reduction in duty for low sulphur fuels in the UK). Reporting of fuel sales under the Commission Decision (which allows Member States to define their own "national fuel grades") has also been varied. Member States should be applauded for reporting separate data on separately marketed low sulphur fuels (where available), even when official low sulphur grades were not nationally defined.

Figure 17.3: Number of fuel grades available Nationally by fuel type across the EU



17.1.2 Sulphur content

Although low sulphur fuels were available in many countries across the EU (see Figures 17.4 and 17.5), some countries were yet to introduce separately marketed low (<50 ppm) or zero (<10 ppm) sulphur fuels at all (Belgium, Italy, Portugal and Spain). Fuels that have low sulphur content were available in these countries in some cases (as discussed in 17.1.1). However it was not completely clear whether the sulphur content was either not guaranteed (as needed for some next-generation cleaner technologies to function at optimum efficiency), or whether insufficient data is available to specify the sales/availability of low sulphur fuel grades.

Whilst sulphur free petrol was available in Austria, Germany and Ireland; sulphur free diesel was only available in Sweden. Also, in 2001 three countries (Denmark, Sweden and the UK) had fully moved over to low or zero sulphur diesel fuel, but no countries had fully switched to low or zero sulphur petrol.

Figure 17.4: National Sales Proportions of Low Sulphur Petrol Grades across the EU (%)

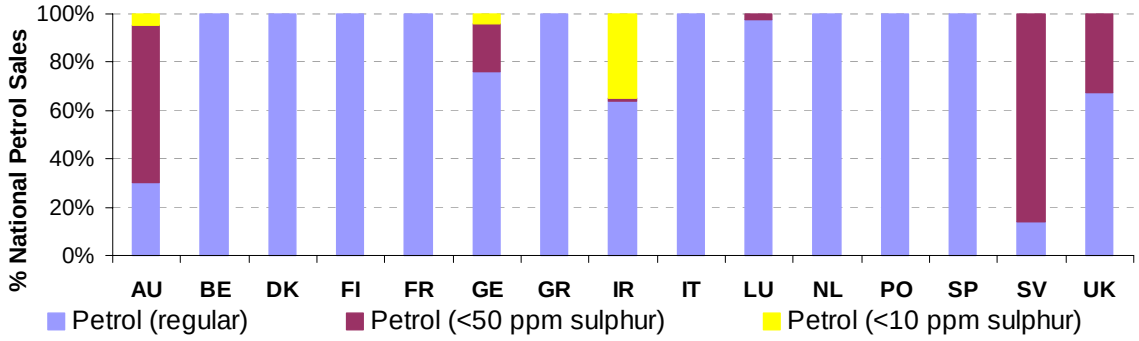
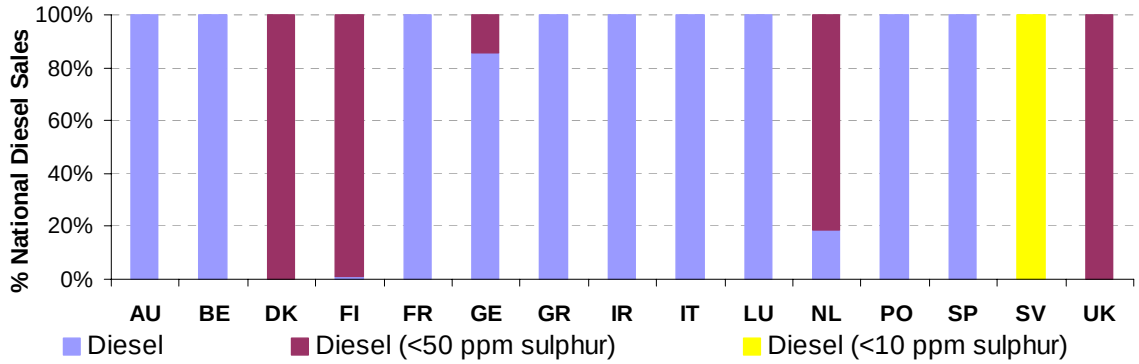


Figure 17.5: National Sales Proportions of Low Sulphur Diesel Grades across the EU (%)



17.2 FUEL QUALITY MONITORING 2001

17.2.1 Description of systems

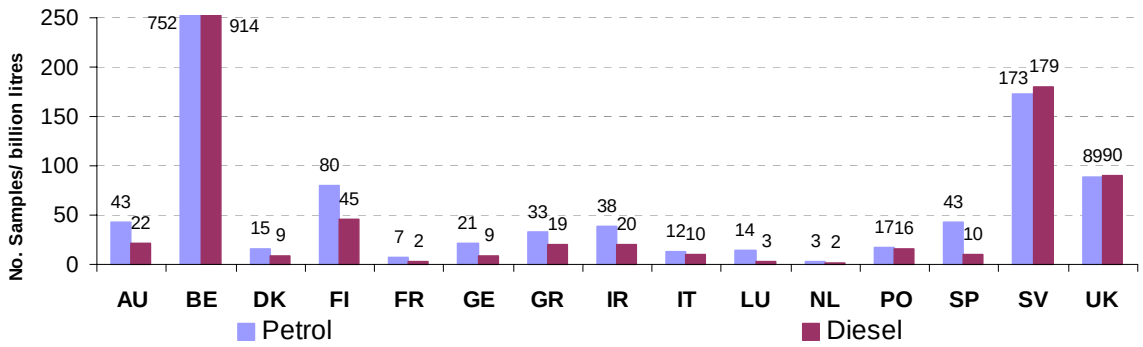
A number of different approaches were made in implementing Fuel Quality Monitoring Systems across the EU. These range from simple sampling at a range of fuel retail stations at certain periods during the year (e.g. Netherlands) through to integration of sampling and analysis of all refinery or imported batches into the requirements for distribution of fuels within the country, together with random sampling across the distribution chain throughout the year (e.g. Sweden and the UK).

A rough appreciation for the degree/rate of sampling carried out may be obtained from Figure 17.6, which plots the total number of samples of petrol and diesel against the respective sales in billion litres. It is clear from this plot that there was a wide range of sampling intensities across the EU. Of particular interest is the very high sampling rate of Belgium (from refuelling stations across the Belgium territory) in relation to the other Member States, even when compared to Sweden and the UK who incorporated sampling and analysis into a mandatory requirement for fuel distribution in their territories. This appears to be an anomaly due to the fact that the Belgium system in operation in 2001 was designed and introduced in 1996 for the purposes of detecting fraud at retail stations. Similarly, the systems active in some other Member States were also designed for other purposes – explaining some of the variations in coverage and application across the EU.

It is worth noting that the degree of sampling that may be required to statistically demonstrate compliance with Directive 98/70/EC could also include a measure of the number of refineries supplying the market, the number of fuel grades available and the number of different imported fuel grades and sources. The European Committee for Standardisation (CEN) is currently in the process of finalisation of EU standards that will cover fuel quality sampling protocol, in accordance to Article 8 (2) of the Directive. These are *prEN 14274:2001 - Automotive fuels - Assessment of petrol and diesel quality - Fuel Quality Monitoring System (FQMS)* and *prEN 14275 - Automotive fuels - Assessment of petrol and diesel quality - Sampling from retail site station pumps and commercial site fuel dispensers*. They have passed the enquiry stage and the formal vote will starts in March 2003. Publication of the final EN's is anticipated August 2003; these should facilitate assessment of whether the method of sampling within a Member State is suitable and demonstrates compliance with Directive 98/70/EC[2]. Nevertheless on the basis of the information provided in 2001 it would appear that the Netherlands and France have particularly low coverage with respect to sales. (France has stated that from 2003 a revised Fuel Quality Monitoring System will be in place, with significant increase in resource.)

[2] in fact the recent amendment to Directive 98/70/EC in January 2003 specifies that "Member States shall establish a fuel quality monitoring system in accordance with requirements of the relevant European Standard" from 1 January 2004.

Figure 17.6: FQM Sampling Rate Across the EU
(Total Number of Samples per Billion Litres Fuel Sold)



In terms of compliance with Directive 98/70/EC, five member states (Finland, Greece, Luxembourg, Sweden and UK) are in complete compliance for both petrol and diesel. More information on reporting on petrol and diesel analysis is provided in the following sections. Detail on specific exceedances is provided in the individual country chapters.

17.2.2 Petrol reporting

In 2001, 10 of the Member States reported at least one petrol sample that was noncompliant with Directive 98/70/EC. Of these, the main parameters of concern were summer vapour pressure (the most often exceeded, across all fuel grades), distillation (evaporation at 100 C) and aromatics content. Motor octane number (MON), benzene content and sulphur content were also exceeded by some samples for more than one Member State. However for all parameters at least one sample exceeded the limit value (and the limit of tolerance for the test method). The complete reported submissions for each Member State are included in Appendix 3 and Appendix 2 includes three charts showing the RON95 grade reporting of vapour pressure, distillation – evaporation at 100 C and aromatics content across the EU.

17.2.3 Diesel reporting

For diesel reporting, only three of the Member States reported at least one sample that was noncompliant with Directive 98/70/EC. Of these, the main parameters of concern were sulphur content and density, however for all parameters the Directive's limit values were exceeded by at least one sample. The complete reported submissions for each Member State are included in Appendix 3 and Appendix 2 includes two charts showing the basic diesel grade reporting of sulphur content and density across the EU.

17.2.4 Summary of Compliance with 98/70/EC

The following table summarises the compliance of Member States with Directive 98/70/EC for the year 2001 reporting.

Table 17.1: Summary of MS compliance with 98/70/EC for 2001 reporting.

Member State	Limit value non-compliance		Incomplete reporting	
	Gasoline	Diesel	Gasoline	Diesel
Austria	X	(1)	X	
Belgium	X	X	X	X
Denmark	X		X	
Finland	X	X		
France	X	X	X	X
Germany	X	X		
Greece			(2)	
Ireland	(3)			
Italy	X			
Luxembourg			X	X
Netherlands	X		X	
Portugal	(4)		X	
Spain	X			
Sweden	(5)		X	
United Kingdom				

Notes:

(1) Insufficient information provided to enable assessment of whether one particular sample was noncompliant with the distillation limit value.

(2) Although all oxygenates were measured (other than ethers with more than 5 carbon atoms per molecule), Greece has stated the other oxygenates were not added and the oxygen content can be calculated directly from the oxygenates content, so would also be compliant.

(3) Ireland is of the opinion that the exceedances found could not be categorically confirmed because the samples were stored for a longer period than desirable prior to analysis, which could have affected the results disfavourably.

(4) Although all oxygenates were measured (other than ethers with more than 5 carbon atoms per molecule), Portugal has stated the other oxygenates were not added.

(5) The format of the data provided by Sweden (though in compliance with the Commission Decision) does not enable confirmation of whether petrol samples complied with the summer limits. However, Sweden have confirmed that all samples did comply.

17.3 TEMPORAL TRENDS

The following Figures 17.7 to 17.9 show the 5 year trend in Fuel Quality Monitoring reporting in terms of total fuel sales and low sulphur fuel sales as a proportion of total sales in the European Union. Because this was the first year of reporting, there were no particular comments to be made.

Figure is 17.7: Temporal Trends in EU Sales of Petrol and Diesel (million litres)

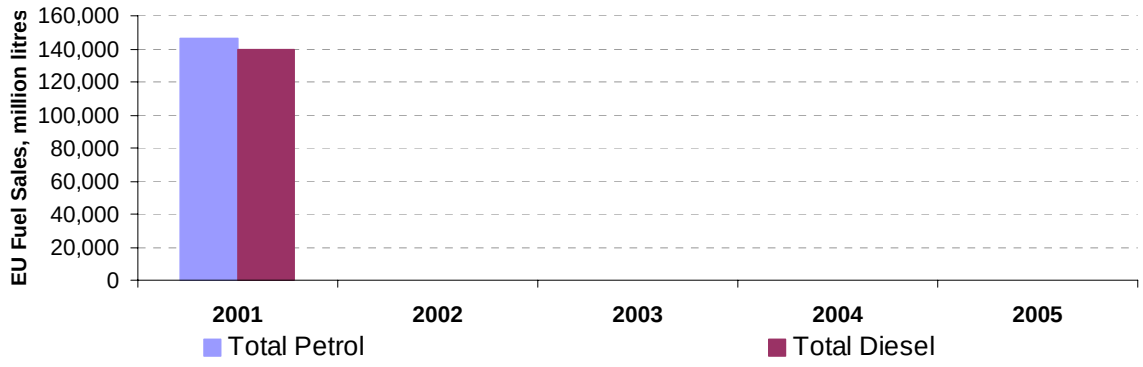


Figure 17.8: Temporal Trends in EU Sales Proportions of Low Sulphur Petrol (%)

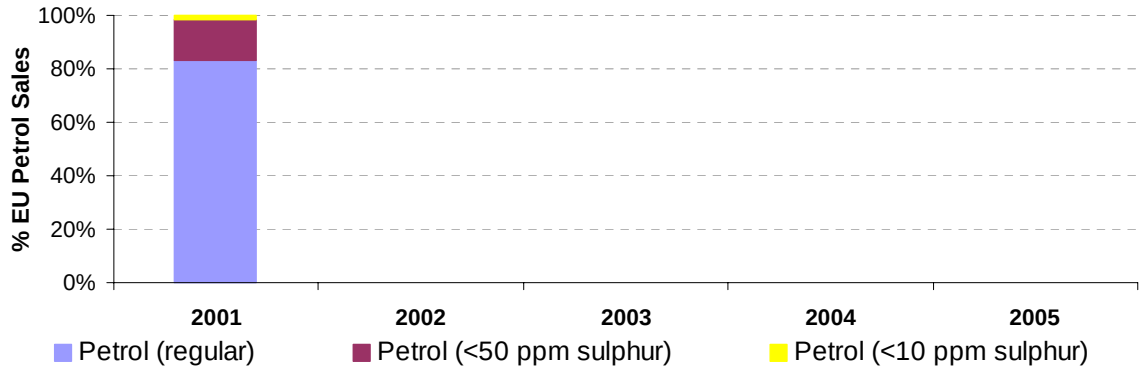
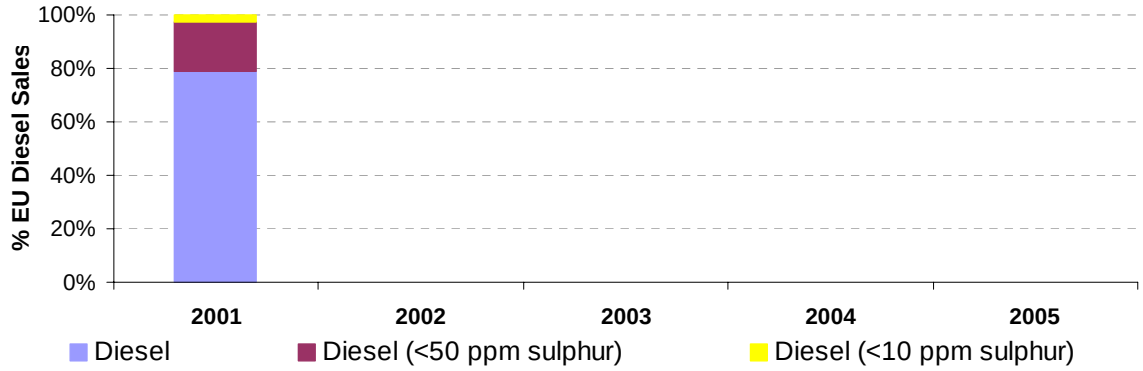


Figure 17.9: Temporal Trends in EU Sales Proportions of Low Sulphur Diesel (%)



18 DISCUSSION & RECOMMENDATIONS

18.1 DISCUSSION

18.1.1 2001 Submissions

18.1.1.1 Completeness

The format for reporting agreed with Member States was officially established with 'Commission Decision of 18/02/2002 on the common format for the submission of summaries of national fuel quality data' (see Appendix 1). In this document it is specified that the first report must be submitted to the European Commission by 30th June 2002 in both paper and electronic formats. In practice the last of the submissions was received by the end of 2002 and a number of submissions were not sent in electronic format at all (France, Italy, Portugal and Spain). In addition to this a number of submissions were not entirely complete - the most common deficiency being lack of coverage of all specified fuel quality parameters. In most cases submissions were not sufficiently explained and necessitated further communications with the designated national contact to obtain clarifications. This being the first year of reporting, it is perhaps to be expected that there were a few areas in need of improvement; on the whole the outlook for fuel quality reporting seems positive.

A deadline of 21st February 2003 was set for responses to queries on data omissions and clarifications and additional information was also gathered at an expert meeting with Member States on 3rd April 2003. Responses were received from most contacts for most points. However, this naturally caused some delay to the analysis and reporting on the 2001 submissions and complicated the establishment of compliance with the Directive in some cases. Cases of specific data gaps in violation of the Commission Decision have been outlined in the previous Member State sections, together with any clarifying information provided in response to queries.

18.1.1.2 Fuel Quality Submission Database

In addition to the preparation of this summary report, a Microsoft Access database was produced containing the basic reporting data and essential information provided by Member States. The database has been constructed to allow for easy input, storage/viewing of submission data, printable reports including both full reported data sets, as well as Member State and EU Summary Reports with a degree of basic analysis and graphical presentation of results and trends. It is anticipated that this database will be made available to Member States and potentially the wider general public once complete and it has been designed to incorporate reported data for subsequent years. In order to take full advantage of the functionality of the database it is also desirable for submissions to follow a more specific structured format in the future. This is discussed further in the next section.

18.1.2 The Reporting Format

In addition to the gaps/omissions in reporting, it has become clear that there are number of areas where the current Reporting Format may be improved to enhance the usefulness and uniformity of the information and data that is submitted. There are number of areas which are

currently rather open-ended in the requirement for reporting (Description of Fuel Quality Monitoring System and Geographical Availability of Sulphur Free Fuels), resulting in a large range of level of detail provided by Member States. Other areas (e.g. Total Sales table) could benefit from revision to provide clearer reporting and there is a general need to request pertinent additional information to be submitted where there are either exceedances to limit values or omissions in the information provided. This would also reduce the need to return to Member States for clarifications or additional information.

18.1.2.1 Description of Fuel Quality Monitoring System

The Commission Decision of 18/02/2002 (Appendix 1), only requests that "*Member States should provide a description on the operation of their national fuel quality monitoring systems*".' This has resulted in a wide variance in the degree and type of detail reported by Member States in 2001 and therefore has made comparisons of the different national systems difficult. It would be useful if there were a standard format or series of headings under which information should be provided. This would ideally tie in with the criteria outlined in the EU standards being finalised by CEN (prEN 14274:2001 and prEN 14275:2001); other suggestions for information that would enable more meaningful analysis are provided in section 18.2.

18.1.2.2 Total Sales of Petrol and Diesel

The table presented in the Commission Decision for reporting of sales of petrol and diesel by Member States (Table 18.1) has resulted in some confusion as to which category certain fuel sales should be reported under (especially where particular grades could be reported under more than one of the categories). This is especially true where there are sales of low-sulphur or zero sulphur fuels at more than one octane grade (petrol). In some cases Member States have reported aggregated totals for low-sulphur or zero sulphur fuels as well as reporting the same fuels under the different octane grades. In other cases Member States have expanded the table themselves in order to more accurately report sales of particular combinations of octane and sulphur content. Sometimes discrepancies were only realised after comparison with the grades that were reported as result of sampling and analysis. An expanded table reflecting all the combinations and providing additional clarification on filling out the table would seem to be beneficial. This would reduce the need to return to Member States for clarification at a later stage where it is not obvious what is meant. Additional comments on the completeness and availability of sales data would also be beneficial.

Table 18.1: Format of the reporting table for total sales of petrol and diesel (Commission Decision 18/02/2002)

Fuel Grade	National sales total (litres/tonnes)
Regular unleaded petrol (minimum RON = 91)	
Unleaded petrol (minimum RON = 95)	
Unleaded petrol (minimum RON = 95 & < 50 ppm sulphur)	
Sulphur free unleaded petrol (< 10 ppm sulphur)	
Unleaded petrol (95 =< RON < 98)	
Unleaded petrol (RON >= 98)	
Diesel fuel	
Diesel fuel (< 50 ppm sulphur)	
Diesel fuel (< 10 ppm sulphur)	

18.1.2.3 Geographical Availability of Sulphur Free Fuels

This is another area in which the format and detail of information provision is not specified in the Commission Decision. Whilst this is not critical at this time, as few Member States have introduced zero sulphur fuels, compliance with the Directive (following revisions agreed between the Council of Ministers and European Parliament in December 2002) in future years would require specific detail. The Directive amendment currently specifies that zero sulphur fuel should be available "on an appropriately balanced geographical basis" from January 2005 in Member States, however how this is to be measured does not appear to be addressed as yet. Further thought needs to be given to this issue and the reporting format updated to reflect more clearly the information that Member States should provide in order to demonstrate compliance. To this end the European Commission has issued a call to tender for work which will address on this issue.

18.1.2.4 Petrol and Diesel Reporting Formats

Whilst the Commission Decision clearly outlines the format for reporting and the data that is required, it does not specifically request supporting information to explain any omissions, variances in test methods used or exceedances and their significance. Although it could be argued that Member States should naturally provide this information, in practice this has not been the case in most instances and further clarifications have needed to be sought. Further, since the limit value for the vapour pressure of petrol only applies to the summer period, in some cases it has been difficult to tell whether this has been exceeded or not. Where Member States have not presented separate information on summer and winter analysis (though not required) it is not possible to see from the existing reporting format whether exceedances of this limit actually occurred within the summer period or not. In these cases it was necessary to seek clarification from Member States as to whether any of the summer period samples analysed exceeded the limit value. Cases where Member States have presented separate reporting tables for summer and winter periods in order to demonstrate compliance have also complicated analysis. A better solution would be to present summer measurements and winter measurements separately in the same reporting table (or simply only report the summer data needed).

In addition to this the Commission Decision does not stipulate that the reporting format for analysis is split into the same categories as those presented in the sales table. Some Member States have therefore presented aggregated sampling analysis data for all petrol or all diesel fuels. This has reduced the capacity for meaningful analysis of trends in different parameter values for different fuel grades, and for comparison of degrees of sampling across different grades. Separate reporting by fuel grade is preferable.

Recommendations on revisions to the Reporting Format are presented in Section 18.2.

18.2 RECOMMENDATIONS

There are number of revisions to the Reporting Format which would enhance the usefulness of the information and facilitate more meaningful analysis of EU trends in order to highlight areas of concern/needing particular attention. We have made a number of suggestions as to what these could ideally be, listed as follows:

1) *Description of Fuel Quality Monitoring System*: more structured information needed on:
   a) Responsible organisations (sampling, analysis and overall reporting);
   b) Type of locations of sampling (e.g. refineries and terminals, distribution centres, refuelling stations, etc);
   c) Time/frequency/occasion of sampling;
   d) Number of samples taken by sales category;
   e) Number of refineries serving the market, and number of sources of imported fuels;
   f) Test method specification in relation to those specified in Directive 98/70/EC, with any reasons for variation;
   g) Method of collection of sales data;
   h) Any other pertinent details (such as planned future revisions);
2) *Total Sales of Petrol and Diesel:*
   a) Further split the table so that all sulphur level and RON grade combinations are available;
   b) Comments on availability and completeness of sales data (particularly with regards to how low sulphur fuel is marketed) and its relation to "national fuel grades";
3) *Geographic Availability of Zero Sulphur Fuels*: this area needs defining more clearly, more detail is needed on things such as, the percentage of fuel stations with the fuels available, regional spread or availability in cities vs rural areas;
4) *Summer Period:* full description of national coverage and limits in addition to the mandatory period, i.e. 1st May to 30th September (vapour pressure limit 60.0 kPa), or 1st June to 31st August ("Arctic conditions", 70.0 kPa);
5) *Petrol & Diesel Reporting:*
   a) Report measurements of summer and winter vapour pressure separately (petrol);
   b) Require separate reporting tables for each marketed fuel type provided in the total sales table (see comments above);
   c) Requirement to specify test method used (if different from that specified in the directive), reasons for its use and the test reproducibility;
   d) Provide full notes on any exceedances (number of samples exceeding the limit value, individual values for exceedances, statistical significance, action taken);
6) *Sample Sizes:* more information is needed to place in context for example number of refineries supplying the market, the number of different grades supplied and the number of different fuels imported;
7) *Other*:
   a) Notes on points of significance, e.g. any omissions in the current reporting, revisions or planned revisions to the Fuel Quality Monitoring System;
   b) Submissions presented in a single defined electronic format (such as Microsoft Excel).

In line with these suggestions (and discussions at the experts meeting) we have produced an Excel reporting template, which has been submitted to the European Commission and Member States with a request that this template is used for reporting of 2002 data (see Appendix 4). The EC have indicated they would like to invite Member States to supply this optional additional data in the next round. An Excel template without the additional information was also prepared and sent out, for Member States who did not feel they were able to supply the additional information.

Appendices

CONTENTS

Appendix 1: Commission Decision of 18/02/2002- 2002/159/EC

COMMISSION

COMMISSION DECISION
of 18 February 2002
on a common format for the submission of summaries of national fuel quality data

(notified under document number C(2002) 508)

(2002/159/EC)

THE COMMISSION OF THE EUROPEAN COMMUNITIES,

Having regard to the Treaty establishing the European Community,

Having regard to Directive 98/70/EC of the European Parliament and of the Council of 13 October 1998 relating to the quality of petrol and diesel fuels and amending Council Directive 93/12/EEC [1], and in particular Article 8(3) thereof,

Whereas:

(1) It is necessary for the Member States to monitor the quality of petrol and diesel fuels marketed in their territories in order to ensure compliance with the environmental specifications contained in Directive 98/70/EC and to ensure the effectiveness of measures to reduce atmospheric pollution caused by vehicles.

(2) It is necessary to establish a common reporting format for the submission of fuel quality monitoring information in accordance with Article 8(3) of Directive 98/70/EC,

HAS ADOPTED THIS DECISION:

Article 1

This Decision establishes a common format for the submission of national fuel quality data in accordance with Article 8 of Directive 98/70/EC.

Article 2

Member States shall use the format set out in the Annex, when making their submission to the Commission.

Article 3

This Decision is addressed to the Member States.

Done at Brussels, 18 February 2002.

For the Commission
Margot WALLSTRÖM
Member of the Commission

[1] OJ L 350, 28.12.1998, p. 58.

ANNEX

ON A COMMON FORMAT FOR THE SUBMISSION OF SUMMARIES OF NATIONAL FUEL QUALITY DATA

1. INTRODUCTION

Directive 98/70/EC of the European Parliament and of the Council of 13 October 1998 relating to the quality of petrol and diesel fuels and amending Directive 93/12/EEC [1], as last amended by Commission Directive 2000/71/EC [2], sets the environmental specifications for all petrol and diesel fuel marketed in the European Union. These specifications can be found in Annexes I to IV of the Directive. Article 8(1) obliges the Member States to monitor the compliance with these fuel quality specifications according to the analytical measurement methods referred to in the Directive. By no later than 30 June each year the Member States must submit a summary of the fuel quality monitoring data collected during the period January to December of the previous calendar year. The first report must be made by 30 June 2002. The reporting format contained herein has been established by the European Commission in accordance with Article 8(3) of Directive 98/70/EC and this Decision.

2. DETAILS OF THOSE COMPILING THE FUEL QUALITY MONITORING REPORT

The authorities responsible for compiling the fuel quality monitoring report are requested to complete the table below.

Reporting year	
Country	
Date report completed	
Institute responsible for report	
Address of institute	
Person responsible for report	
Telephone No:	
E-mail:	

3. DEFINITIONS AND EXPLANATION

Parent fuel grade: Directive 98/70/EC sets the environmental specifications for petrol and diesel fuel marketed in the EU. The specifications in the Directive can be thought of as 'parent fuel grades'. These include (i) regular unleaded petrol (RON > 91), (ii) unleaded petrol (RON > 95) and (iii) diesel fuel.

National fuel grade: Member States may, of course, define 'national' fuel grades which must still, however, respect the specification of the parent fuel grade. For example, national fuel grades may comprise super unleaded petrol (RON > 98), lead replacement petrol, zero sulphur petrol, 50 ppm sulphur petrol, zero sulphur diesel, 50 ppm sulphur diesel, etc.

Zero sulphur or sulphur-free fuels are petrol and diesel fuels which contain less than 10 mg/kg (ppm) of sulphur.

4. DESCRIPTION OF FUEL QUALITY MONITORING SYSTEM

Member States should provide a description on the operation of their national fuel quality monitoring systems.

[1] OJ L 350, 28.12.1998, p. 58.
[2] OJ L 287, 14.11.2000, p. 46.

5. TOTAL SALES OF PETROL AND DIESEL

Member States are requested to complete the following table detailing the quantities of each grade of petrol and diesel marketed in their territory.

Fuel grade	National sales total (litres/tonnes)
Regular unleaded petrol (minimum RON = 91) (1)	
Unleaded petrol (minimum RON = 95) (1)	
Unleaded petrol (minimum RON = 95 and less than 50 ppm sulphur) (2)	
Sulphur-free unleaded petrol (less than 10 ppm sulphur) (3)	
Unleaded petrol (95 ≤ RON < 98)	
Unleaded petrol (RON ≥ 98)	
Diesel fuel (4)	
Diesel fuel (less than 50 ppm sulphur) (5)	
Diesel fuel (less than 10 ppm sulphur) (6)	

(1) As specified in Annex I of Directive 98/70/EC.
(2) As specified in Annex III of Directive 98/70/EC.
(3) As specified in Annex III of Directive 98/70/EC except the sulphur content which must be less than 10 ppm.
(4) As specified in Annex II of Directive 98/70/EC.
(5) As specified in Annex IV of Directive 98/70/EC.
(6) As specified in Annex IV of Directive 98/70/EC except the sulphur content which must be less than 10 ppm.

6. GEOGRAPHICAL AVAILABILITY OF SULPHUR-FREE FUELS

The Member States are requested to provide a description on the extent to which (i.e. geographic availability) sulphur-free fuels are marketed in their territory.

Brief description of the geographical extent to which sulphur-free petrol and diesel are marketed within the territory of a Member State.

7. DEFINITION OF SUMMER PERIOD FOR PETROL VOLATILITY

Directive 98/70/EC requires the vapour pressure of petrol to be less than 60,0 kPa during the summer period which spans 1 May until 30 September. However, for those Member States which experience 'arctic conditions' the Summer period covers the period 1 June to 31 August and the vapour pressure must not exceed 70 kPa. Member States are requested to define the Summer period implemented in their territories.

Sommer period (defined for petrol volatility)	

8. REPORTING FORMAT FOR PETROL

Member States should submit a summary report for the petrol quality monitoring data (for both nationally defined and parent grades) that they have collected in a given calendar year (January to December). This summary table is attached at Appendix I. Test methods shall be those included in EN228: 2000 or later version as appropriate.

9. REPORTING FORMAT FOR DIESEL FUEL

Member States should submit a summary report for the diesel fuel quality monitoring data (for nationally defined and parent grades) that they have collected in a given calendar year (January to December). This summary table is attached at Appendix II. Test methods shall be those included in EN590: 2000 or later versions as appropriate.

10. Submission of fuel quality monitoring report

The fuel quality monitoring report should be submitted formally to the following person:

The Secretary General
The European Commission
Rue de la Loi/Wetstraat 200
B-1049 Brussels.

In addition, the report should be submitted in electronic form to the following email address: env-report-98-70@cec.eu.int

Appendix I

Market fuels used in vehicles with spark ignition engines (petrol)

Country	
Reporting year	
Parent or national fuel grade	

Parameter	Unit	Analytical and statistical results					Limiting value (1)			
							National specification, if any		According to 98/70/EC	
		Number of samples	Minimum	Maximum	Mean	Standard deviation	Minimum	Maximum	Minimum	Maximum
Research octane No	—								95	—
Motor octane No	—								85	
Vapour pressure, DVPE	kPa								—	60,0
Distillation:										
— evaporated at 100 °C	%(v/v)								46,0	—
— evaporated at 150 °C	%(v/v)								75,0	—
Hydrocarbon analysis:										
— olefins	%(v/v)									18,0
— aromatics	%(v/v)									42,0
— benzene	%(v/v)									1,0
Oxygen content	%(m/m)								—	2,7
Oxygenates:										
— Methanol	%(v/v)								—	3
— Ethanol	%(v/v)								—	5
— Iso-propyl alcohol	%(v/v)								—	10
— Tert-butyl alcohol	%(v/v)								—	7
— Iso-butyl alcohol	%(v/v)								—	10
— Ethers with five or more carbon atoms per molecule	%(v/v)								—	15
— other oxygenates	%(v/v)								—	10
Sulphur content	mg/kg								—	150
Lead content	g/l								—	0,005

(1) The limiting values are 'true values' and were established according to the procedures for limit setting in EN ISO 4259:1995. The results of individual measurements shall be interpreted following the criteria described in EN ISO 4259:1995.

Number of samples in month						**Total**	
January		April		July		October	
February		May		August		November	
March		June		September		December	

Appendix II

Market fuels used in vehicles with compression ignition engines (diesel)

Country	
Reporting year	
Parent or national fuel grade	

Parameter	Unit	Analytical and statistical results					Limiting value (1)			
							National specifications		According to 98/70/EC	
		Number of samples	Minimum	Maximum	Mean	Standard deviation	Minimum	Maximum	Minimum	Maximum
Cetane No	—								51,0	—
Density at 15 °C	kg/m³								—	845
Distillation — 95 % Point	°C								—	360
Polycyclic aromatic hydrocarbons	%(m/m)								—	11
Sulphur content	mg/kg								—	350

(1) The limiting values are 'true values' and were established according to the procedures for limit setting in EN ISO 4259:1995. The results of individual measurements shall be interpreted following the criteria described in EN ISO 4259:1995.

Number of samples in month			
January		July	
February		August	
March		September	
April		October	
May		November	
June		December	
		Total	

Appendix 2: Fuel Parameter Charts by Member State

CONTENTS

Introduction to Appendix 2 Figures

Included in this appendix are examples of the most common exceedances of the Directive 98/70/EC limit values for petrol and diesel.

Petrol Charts
The petrol charts are for the minimum RON 95 grade of petrol only, which was available in most Member States (except Austria, Portugal and Sweden).

1 RON95 Petrol – Vapour Pressure
Some Member States have reported both winter and summer vapour pressure measurements under this heading. These are included in this chart where data has been reported.
Zero values:

- Germany and Luxembourg reported separate winter and summer values (not included here).
- France and the Netherlands did not carry out analysis for vapour pressure at all.

2 RON95 Petrol – Vapour Pressure (Summer)
This chart shows the results of sample analysis by Member States where it has been reported separately for the summer period (where the limit values apply).
Zero values:

- Greece, Ireland, Italy and Spain have not reported separate summer values.
- France and the Netherlands did not carry out analysis for vapour pressure at all.

3 RON95 Petrol – Distillation, evaporated at 100 C
Zero values:

- Denmark did not carry out analysis for distillation at all.

4 RON95 Petrol – Aromatics content
Zero values:

- Belgium, France and Luxembourg did not carry out analysis for aromatics at all.

Diesel Charts
The diesel charts are for the regular grade fuel, on sale in the majority of the Member States (with the exception of Denmark, Sweden and the UK, where only lower sulphur grades were available).

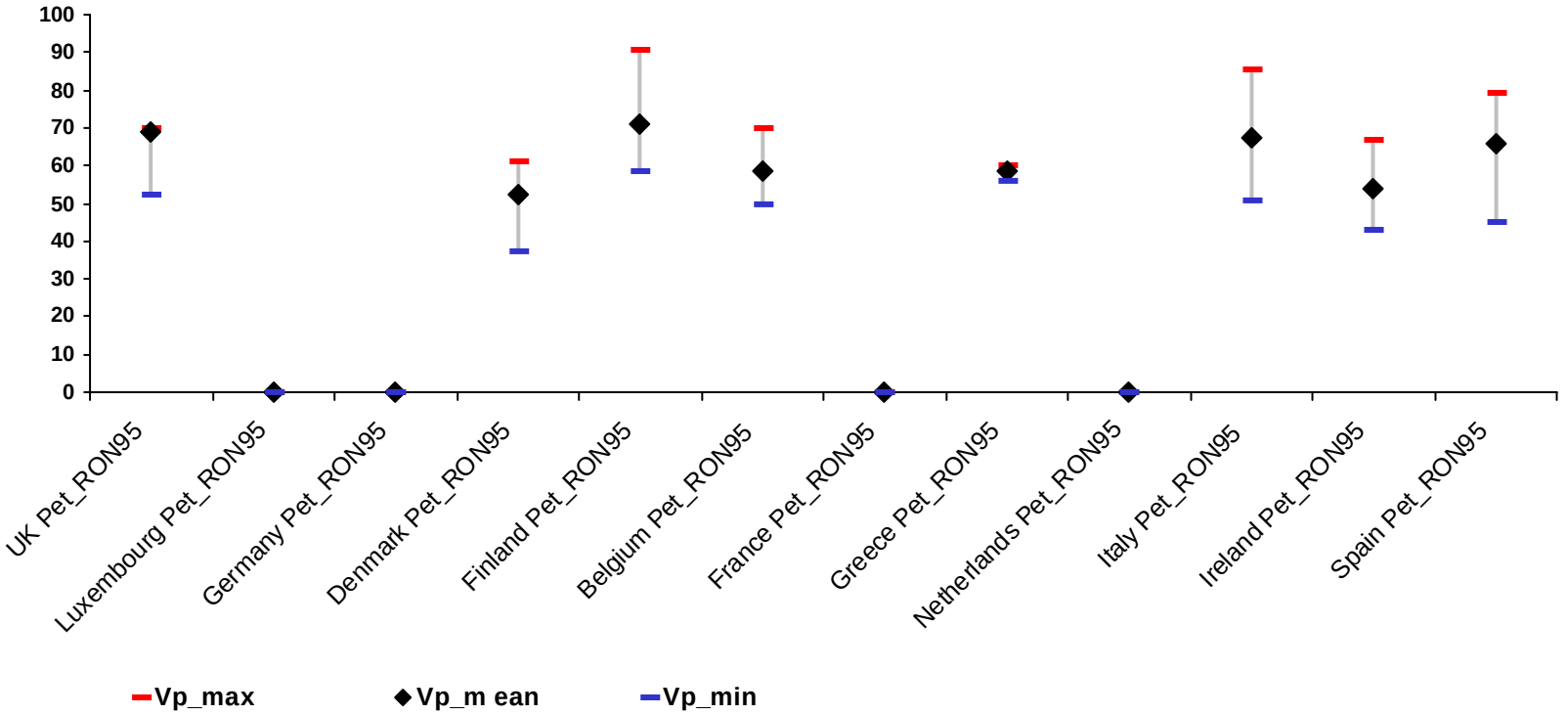
5 Diesel Fuel – Density

6 Diesel Fuel – Sulphur Content

Variation in Fuel Parameter by Country and Fuel Grade

2001 Unleaded petrol min. RON=95

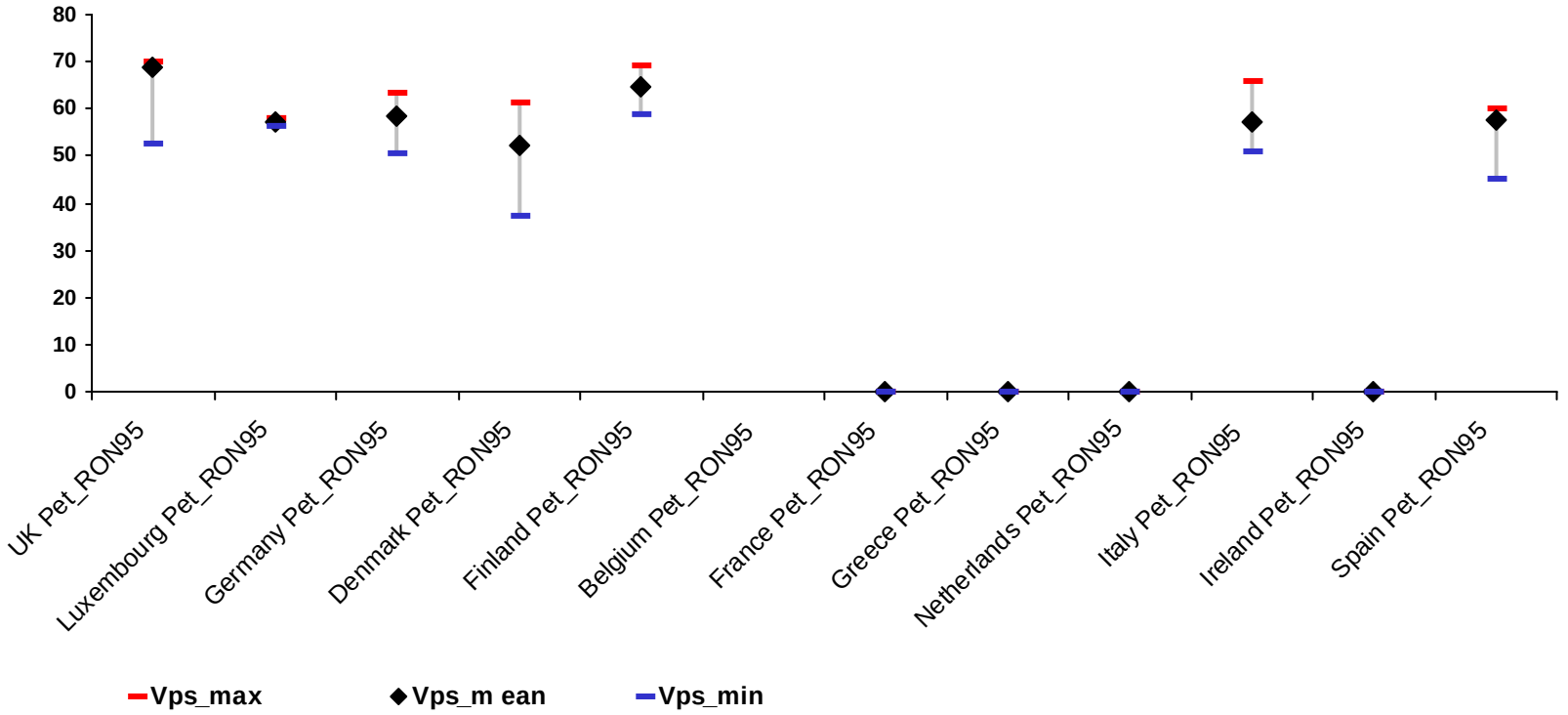
Vapour pressure, (limit value = 60 kPa max, summer only; exception: 70 kPa max for Fi, Ir, Se & UK, summer only)



Variation in Fuel Parameter by Country and Fuel Grade

2001 Unleaded petrol min. RON=95

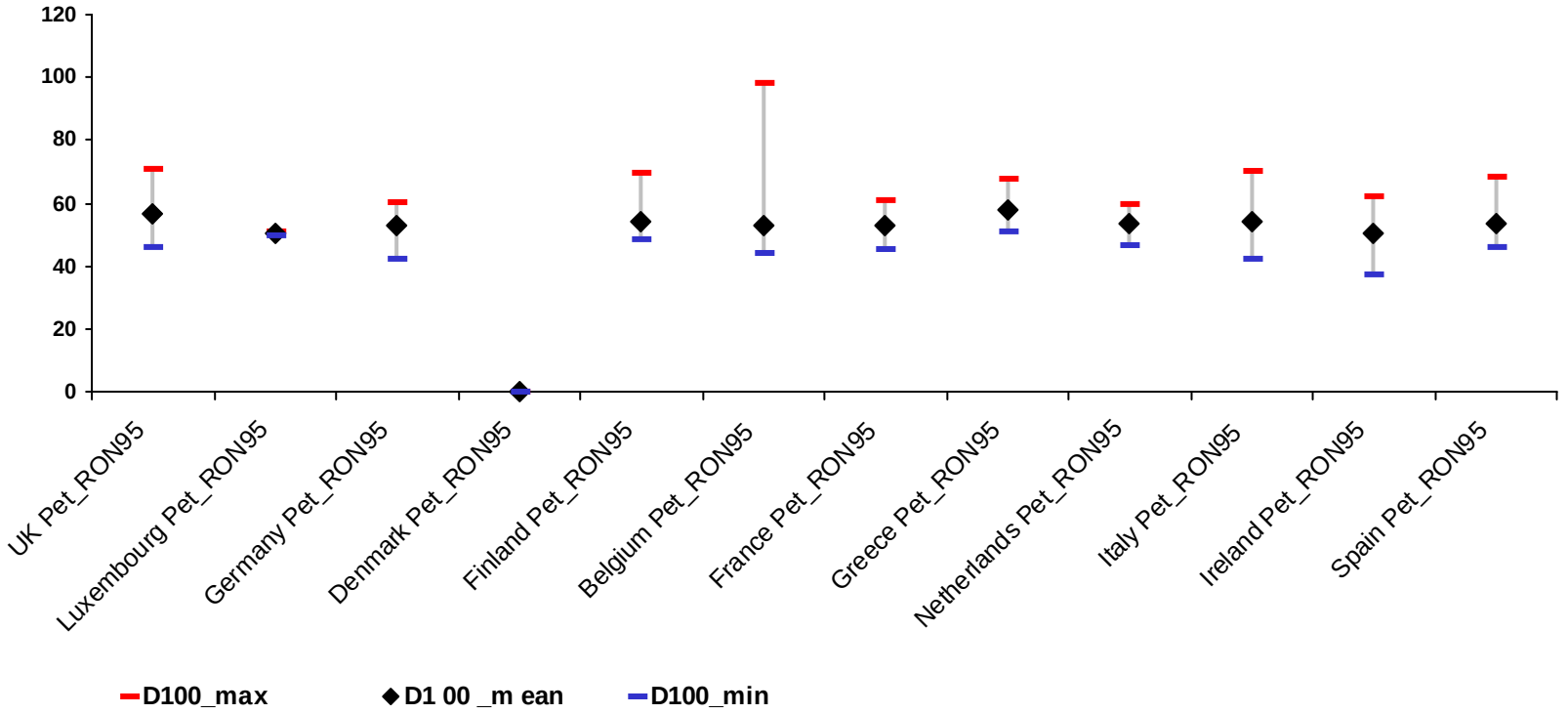
Vapour pressure Summer, (limit value = 60 kPa max; exception: 70 kPa max for Fi, Ir, Se & UK)



Variation in Fuel Parameter by Country and Fuel Grade

2001 Unleaded petrol min. RON=95

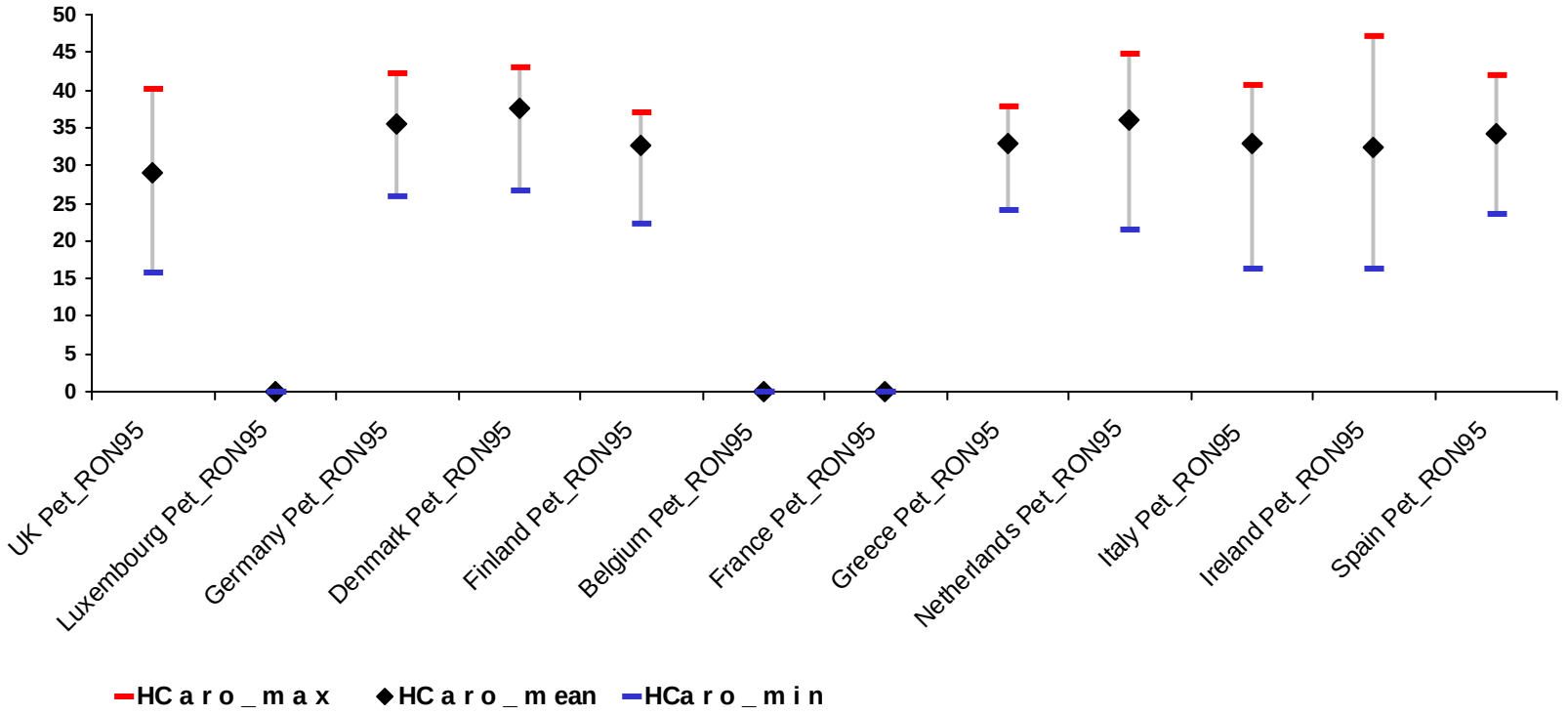
Distillation, evaporated at 100 degrees C, (limit value minimum = 46.0%v/v)



Variation in Fuel Parameter by Country and Fuel Grade

2001 Unleaded petrol min. RON=95

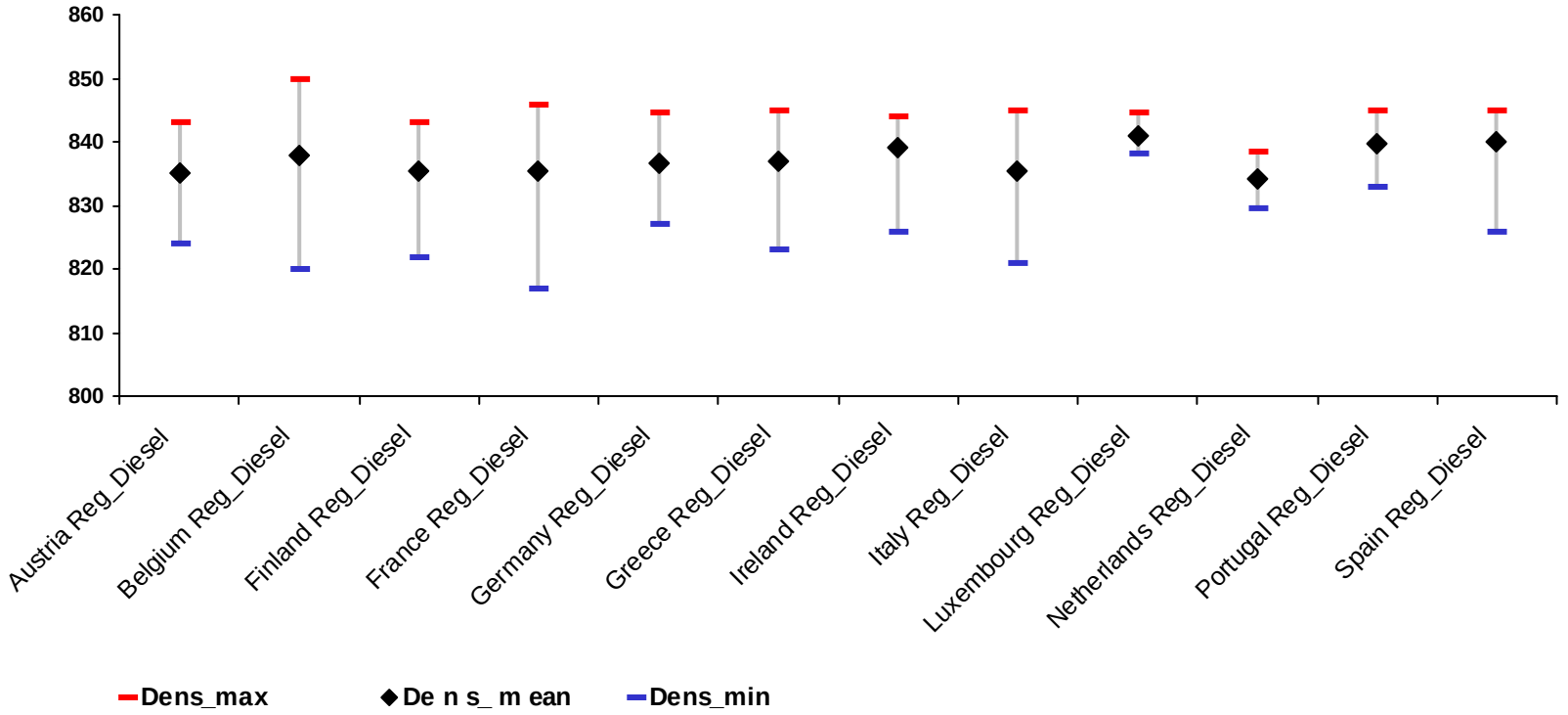
Hydrocarbon analysis; aromatics, (limit value maximum = 42.0%v/v)



Variation in Fuel Parameter by Country and Fuel Grade

2001 Diesel fuel

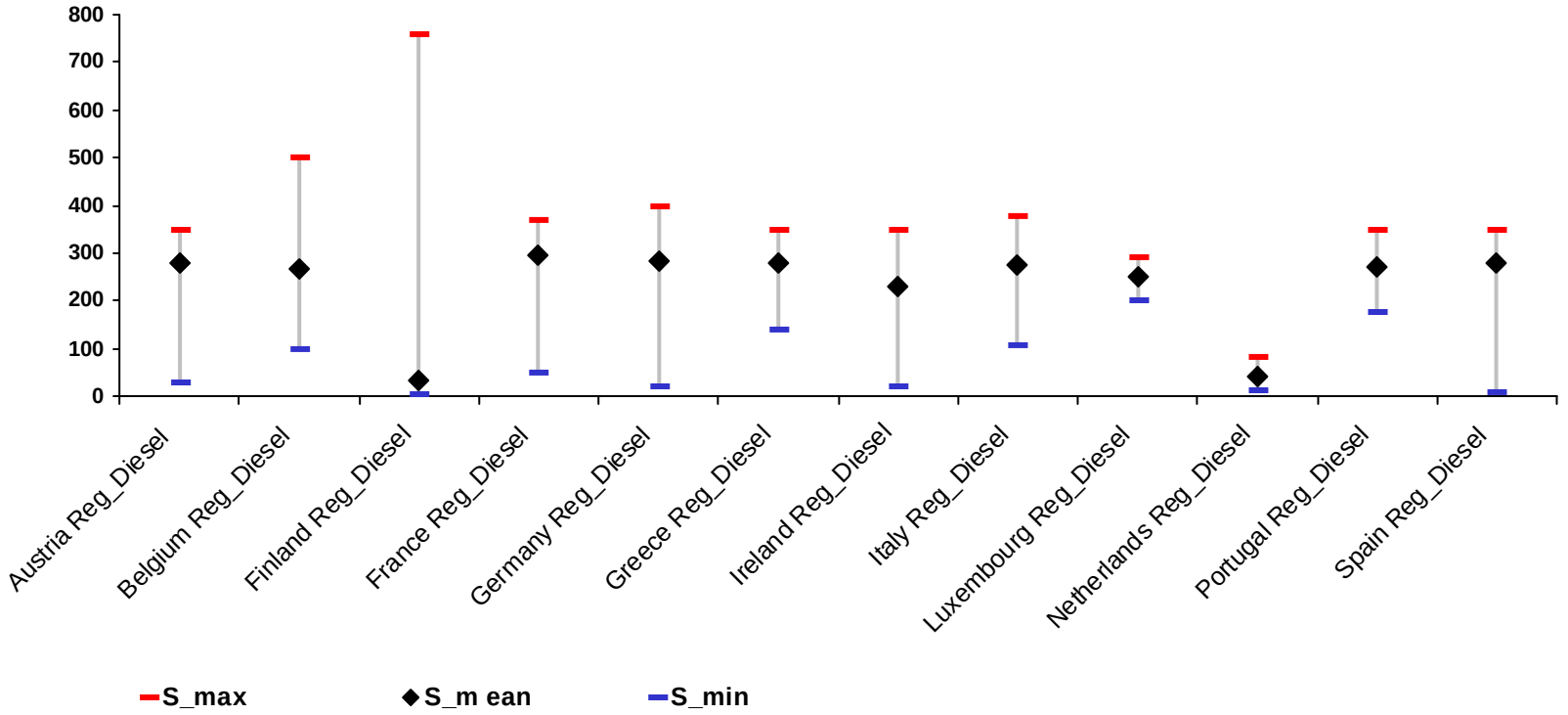
Density at 15 degrees C, (limit value = 845 kg/m3 maximum)



Variation in Fuel Parameter by Country and Fuel Grade

2001 Diesel fuel

Sulphur content, (limit value = 350 mg/kg maximum)



Appendix 3: Member State Fuel Quality Submission Tables

CONTENTS

Introduction to Appendix 3 Reporting Tables

The following tables represent the output from the Fuel Quality Summary database, produced as part of this work. Some of the Member States provided separate reporting tables for summer and winter period sampling. In these cases data were combined in the following manner for each of the parameters:

Number of samples (N): direct sum of the two values;

Minimum: the lowest of the two values;

Maximum: the highest of the two values;

Mean (m): Mean of 2 data sets = $((m_1*n_1) + (m_2*n_2)) / N$

Where:
N = total number of samples
m_1 = mean data set 1, m_2 = mean data set 2
n_1 = no. samples in data set 1, n_2 = no. samples in data set 2

In accordance with:
Mean = sum of sample values / number of samples

Standard deviation: This was estimated on the basis of the following approximation (in the absence of knowing the raw data values):

Overall SD = $\sqrt{[\ \{\ (sd_1^2*(n_1-1)) + (sd_2^2*(n_2-1))\ \}\ /(N-1)\ ]}$

Where: sd_1 = standard deviation of data set 1, etc.

The true formula for standard deviation is:

SD = $\sqrt{[(\text{sum(all data values)} - \text{mean})^2\ /(N-1)]}$

Where x = data value

Market Fuels used in vehicles with spark ingnition engines (Petrol)

Country: Austria

Year: 2001

FuelID: Regular unleaded petrol min. RON=91

National Fuel Grade Normal

PARAMETER	Unit	Number of Samples	Min.	Max.	Mean	Standard deviation	National Specification Min.	National Specification Max.	EC Limit values Min.	EC Limit values Max.
RESEARCH OCTANE NO.	--	40	92.4	95.7	93.5	0.65	91		95	--
MOTOR OCTANE NO.	--	40	82.3	85.5	83.2	0.53	82		85	--
VAPOUR PRESSURE, DVP	kPa	40	57.1	89.4	71.8	12.09			--	60
Summer period	kPa							90	--	60
Winter period	kPa							60	--	--
DISTILLATTION:										
evaporated at 100	%(v/v)	40	48.7	66.9	54.8	4.6	46	71	46.0	--
evaporated at 150	%(v/v)	40	77.9	93.3	84.7	4.2	75		75.0	--
HYDROCARBON ANALYSIS:										
olefins	%(v/v)								--	18.0
aromatic	%(v/v)								--	42.0
benzene	%(v/v)	40	0.6	0.9	0.7	0.1		1	--	1.0
OXYGEN CONTENT	%(m/m)	40	0.1	1.2	0.2	0.19		2.7	--	2.7
OXYGENATES:										
Methanol	%(v/v)								--	3
Ethanol	%(v/v)								--	5
Iso-propyl alcohol	%(v/v)								--	10
Tetro-butyl alcohol	%(v/v)								--	7
Iso-butyl alcohol	%(v/v)								--	10
Ethers with 5 or more C atoms per molecule	%(v/v)								--	15
Other oxygenate	%(v/v)								--	10
SULPHUR CONTENT	mg/kg	40	8	85	27.8	16.7		150	--	150
LEAD CONTENT	g/l								--	0.005

Notes:

No sample data

Market Fuels used in vehicles with spark ingnition engines (Petrol)

Country: Austria

Year: 2001

FuelID: Unleaded petrol min. RON=95 (<50 ppm sulphur)

National Fuel Grade Eurosuper

PARAMETER	Unit	Number of Samples	Min.	Max.	Mean	Standard deviation	National Specification Min.	National Specification Max.	EC Limit values Min.	EC Limit values Max.
RESEARCH OCTANE NO.	--	40	95.8	97.4	96.6	0.34	95		95	--
MOTOR OCTANE NO.	--	40	84.5	85.9	85.4	0.32	85		85	--
VAPOUR PRESSURE, DVP	kPa	40	55.4	86.5	71.1	12.2			--	60
Summer period	kPa							90	--	60
Winter period	kPa							60	--	--
DISTILLATTION:										
evaporated at 100	%(v/v)	40	48.4	59.1	53.3	2.3	46		46.0	--
evaporated at 150	%(v/v)	40	79.8	90.6	85.3	2.2	75		75.0	--
HYDROCARBON ANALYSIS:										
olefins	%(v/v)								--	18.0
aromatic	%(v/v)								--	42.0
benzene	%(v/v)	40	0.5	0.9	0.7	0.12		1	--	1.0
OXYGEN CONTENT	%(m/m)	40	0.1	1	0.5	0.22		2.7	--	2.7
OXYGENATES:										
Methanol	%(v/v)								--	3
Ethanol	%(v/v)								--	5
Iso-propyl alcohol	%(v/v)								--	10
Tetro-butyl alcohol	%(v/v)								--	7
Iso-butyl alcohol	%(v/v)								--	10
Ethers with 5 or more C atoms per molecule	%(v/v)								--	15
Other oxygenate	%(v/v)								--	10
SULPHUR CONTENT	mg/kg	40	7	49	18.7	12.1		150	--	150
LEAD CONTENT	g/l								--	0.005

Notes:

No sample data

Market Fuels used in vehicles with spark ingnition engines (Petrol)

Country: Austria

Year: 2001

FuelID: Unleaded petrol RON > 98 (<10 ppm sulphur)

National Fuel Grade Superplus

PARAMETER	Unit	Number of Samples	Min.	Max.	Mean	Standard deviation	National Specification Min.	National Specification Max.	EC Limit values Min.	EC Limit values Max.
RESEARCH OCTANE NO.	--	40	98.1	99.9	99.2	0.61	98		95	--
MOTOR OCTANE NO.	--	40	87.9	89.5	88.3	0.28	88		85	--
VAPOUR PRESSURE, DVP	kPa	40	56.8	85.8	68.8	10.45			--	60
Summer period	kPa							90	--	60
Winter period	kPa							60	--	--
DISTILLATTION:										
evaporated at 100	%(v/v)	40	48.5	60.7	53.3	2.98	46		46.0	--
evaporated at 150	%(v/v)	40	82.3	98.3	86.9	3.34	75		75.0	--
HYDROCARBON ANALYSIS:										
olefins	%(v/v)								--	18.0
aromatic	%(v/v)								--	42.0
benzene	%(v/v)	40	0.3	0.8	0.6	0.12		1	--	1.0
OXYGEN CONTENT	%(m/m)	40	1.6	2.6	2.3	0.27		2.7	--	2.7
OXYGENATES:										
Methanol	%(v/v)								--	3
Ethanol	%(v/v)								--	5
Iso-propyl alcohol	%(v/v)								--	10
Tetro-butyl alcohol	%(v/v)								--	7
Iso-butyl alcohol	%(v/v)								--	10
Ethers with 5 or more C atoms per molecule	%(v/v)								--	15
Other oxygenate	%(v/v)								--	10
SULPHUR CONTENT	mg/kg	40	1	8	4.75	1.9		150	--	150
LEAD CONTENT	g/l								--	0.005

Notes:

No sample data

Market Fuels used in vehicles with spark ingnition engines (Petrol)

Country: Belgium

Year: 2001

FuelID: Unleaded petrol min. RON=95

National Fuel Grade Unleaded

PARAMETER	Unit	Number of Samples	Min.	Max.	Mean	Standard deviation	National Specification Min.	National Specification Max.	EC Limit values Min.	EC Limit values Max.
RESEARCH OCTANE NO.	--	106	77.1	101.1	97.11	0.022			95	--
MOTOR OCTANE NO.	--	104	80.8	85.9	84.73	0.139			85	--
VAPOUR PRESSURE, DVP	kPa	851	50	70	58.6	0.104			--	60
Summer period	kPa								--	60
Winter period	kPa								--	--
DISTILLATTION:										
evaporated at 100	%(v/v)	106	44	98.1	52.67	0.086			46.0	--
evaporated at 150	%(v/v)								75.0	--
HYDROCARBON ANALYSIS:										
olefins	%(v/v)								--	18.0
aromatic	%(v/v)								--	42.0
benzene	%(v/v)	170	0.1	1	0.66	0.01			--	1.0
OXYGEN CONTENT	%(m/m)								--	2.7
OXYGENATES:										
Methanol	%(v/v)								--	3
Ethanol	%(v/v)								--	5
Iso-propyl alcohol	%(v/v)								--	10
Tetro-butyl alcohol	%(v/v)								--	7
Iso-butyl alcohol	%(v/v)								--	10
Ethers with 5 or more C atoms per molecule	%(v/v)								--	15
Other oxygenate	%(v/v)								--	10
SULPHUR CONTENT	mg/kg	170	30	210	68.3	3.134			--	150
LEAD CONTENT	g/l				0.005				--	0.005

Notes:

Market Fuels used in vehicles with spark ingnition engines (Petrol)

Country: Belgium

Year: 2001

FuelID: Unleaded petrol 95 =< RON < 98

National Fuel Grade Unleaded 98

PARAMETER	Unit	Number of Samples	Min.	Max.	Mean	Standard deviation	National Specification Min.	National Specification Max.	EC Limit values Min.	EC Limit values Max.
RESEARCH OCTANE NO.	--	106	77.1	101.1	97.11	0.022	95		95	--
MOTOR OCTANE NO.	--	104	80.8	85.9	84.73	0.139	85		85	--
VAPOUR PRESSURE, DVP	kPa	851	50	70	58.6	0.104	45	60	--	60
Summer period	kPa								--	60
Winter period	kPa								--	--
DISTILLATTION:										
evaporated at 100	%(v/v)	106	44	98.1	52.67	0.086	46		46.0	--
evaporated at 150	%(v/v)								75.0	--
HYDROCARBON ANALYSIS:										
olefins	%(v/v)								--	18.0
aromatic	%(v/v)								--	42.0
benzene	%(v/v)	170	0.1	1	0.66	0.01		1	--	1.0
OXYGEN CONTENT	%(m/m)								--	2.7
OXYGENATES:										
Methanol	%(v/v)								--	3
Ethanol	%(v/v)								--	5
Iso-propyl alcohol	%(v/v)								--	10
Tetro-butyl alcohol	%(v/v)								--	7
Iso-butyl alcohol	%(v/v)								--	10
Ethers with 5 or more C atoms per molecule	%(v/v)								--	15
Other oxygenate	%(v/v)								--	10
SULPHUR CONTENT	mg/kg	170	30	210	68.3	3.134		150	--	150
LEAD CONTENT	g/l				0.005				--	0.005

Notes:

Market Fuels used in vehicles with spark ingnition engines (Petrol)

Country: Denmark

Year: 2001

FuelID: Regular unleaded petrol min. RON=91

National Fuel Grade Petrol 92

PARAMETER	Unit	Number of Samples	Min.	Max.	Mean	Standard deviation	National Specification		EC Limit values	
							Min.	Max.	Min.	Max.
RESEARCH OCTANE NO.	--								95	--
MOTOR OCTANE NO.	--								85	--
VAPOUR PRESSURE, DVP	kPa	5	41.2	65.3	56.4	9.5			--	60
Summer period	kPa	5	41.2	65.3	56.4	9.5			--	60
Winter period	kPa								--	--
DISTILLATTION:										
evaporated at 100	%(v/v)								46.0	--
evaporated at 150	%(v/v)								75.0	--
HYDROCARBON ANALYSIS:										
olefins	%(v/v)	9	0	5.7	2	2.3			--	18.0
aromatic	%(v/v)	9	28.9	41.2	33.4	3.8			--	42.0
benzene	%(v/v)	9	0.7	0.9	0.8	0.09			--	1.0
OXYGEN CONTENT	%(m/m)								--	2.7
OXYGENATES:										
Methanol	%(v/v)								--	3
Ethanol	%(v/v)								--	5
Iso-propyl alcohol	%(v/v)								--	10
Tetro-butyl alcohol	%(v/v)								--	7
Iso-butyl alcohol	%(v/v)								--	10
Ethers with 5 or more C atoms per molecule	%(v/v)	9	0	0.1	0.08	0.04			--	15
Other oxygenate	%(v/v)								--	10
SULPHUR CONTENT	mg/kg	9	1	125	64	47			--	150
LEAD CONTENT	g/l								--	0.005

Notes:

Market Fuels used in vehicles with spark ingnition engines (Petrol)

Country: Denmark

Year: 2001

FuelID: Unleaded petrol min. RON=95

National Fuel Grade Petrol 95

PARAMETER	Unit	Number of Samples	Min.	Max.	Mean	Standard deviation	National Specification Min.	National Specification Max.	EC Limit values Min.	EC Limit values Max.
RESEARCH OCTANE NO.	--								95	--
MOTOR OCTANE NO.	--								85	--
VAPOUR PRESSURE, DVP	kPa	10	37.5	61.2	52.4	8.5			--	60
Summer period	kPa	10	37.5	61.2	52.4	8.5			--	60
Winter period	kPa								--	--
DISTILLATTION:										
evaporated at 100	%(v/v)								46.0	--
evaporated at 150	%(v/v)								75.0	--
HYDROCARBON ANALYSIS:										
olefins	%(v/v)	20	0	6.3	1.9	2.3			--	18.0
aromatic	%(v/v)	20	26.7	42.9	37.6	3.7			--	42.0
benzene	%(v/v)	20	0.37	0.91	0.82	0.13			--	1.0
OXYGEN CONTENT	%(m/m)								--	2.7
OXYGENATES:										
Methanol	%(v/v)								--	3
Ethanol	%(v/v)								--	5
Iso-propyl alcohol	%(v/v)								--	10
Tetro-butyl alcohol	%(v/v)								--	7
Iso-butyl alcohol	%(v/v)								--	10
Ethers with 5 or more C atoms per molecule	%(v/v)	20	0	9.3	0.8	2.2			--	15
Other oxygenate	%(v/v)								--	10
SULPHUR CONTENT	mg/kg	20	1	126	44	37			--	150
LEAD CONTENT	g/l								--	0.005

Notes:

Market Fuels used in vehicles with spark ingnition engines (Petrol)

Country: Denmark

Year: 2001

FuelID: Unleaded petrol RON > 98

National Fuel Grade Petrol 98

PARAMETER	Unit	Number of Samples	Min.	Max.	Mean	Standard deviation	National Specification		EC Limit values	
							Min.	Max.	Min.	Max.
RESEARCH OCTANE NO.	--								95	--
MOTOR OCTANE NO.	--								85	--
VAPOUR PRESSURE, DVP	kPa	5	48	66.1	56.6	6.8			--	60
Summer period	kPa	5	48	66.1	56.6	6.8			--	60
Winter period	kPa								--	--
DISTILLATTION:										
evaporated at 100	%(v/v)								46.0	--
evaporated at 150	%(v/v)								75.0	--
HYDROCARBON ANALYSIS:										
olefins	%(v/v)	11	0	3.9	0.9	1.2			--	18.0
aromatic	%(v/v)	11	34.4	43.4	40.1	2.5			--	42.0
benzene	%(v/v)	11	0.27	0.91	0.79	0.19			--	1.0
OXYGEN CONTENT	%(m/m)								--	2.7
OXYGENATES:										
Methanol	%(v/v)								--	3
Ethanol	%(v/v)								--	5
Iso-propyl alcohol	%(v/v)								--	10
Tetro-butyl alcohol	%(v/v)								--	7
Iso-butyl alcohol	%(v/v)								--	10
Ethers with 5 or more C atoms per molecule	%(v/v)	11	0.17	12.7	8.5	4.7			--	15
Other oxygenate	%(v/v)								--	10
SULPHUR CONTENT	mg/kg	11	1	83	32	30			--	150
LEAD CONTENT	g/l	2	0	0.001	0	0			--	0.005

Notes:

Market Fuels used in vehicles with spark ingnition engines (Petrol)

Country: Finland

Year: 2001

FuelID: Unleaded petrol min. RON=95

National Fuel Grade Unleaded Petrol 95

PARAMETER	Unit	Number of Samples	Min.	Max.	Mean	Standard deviation	National Specification Min.	National Specification Max.	EC Limit values Min.	EC Limit values Max.
RESEARCH OCTANE NO.	--	131	95.2	97.3	96.7	0.47			95	--
MOTOR OCTANE NO.	--	131	85.2	87.2	85.9	0.3			85	--
VAPOUR PRESSURE, DVP	kPa	137	58.7	90.5	71	4.05			--	70
Summer period	kPa	88	58.7	69.3	64.8	1.7		70	--	70
Winter period	kPa	49	66.7	90.5	83.6	6.7			--	--
DISTILLATTION:										
evaporated at 100	%(v/v)	131	48.2	69.4	54.4	3.72			46.0	--
evaporated at 150	%(v/v)	131	83.6	92.2	88.5	1.48			75.0	--
HYDROCARBON ANALYSIS:										
olefins	%(v/v)	129	4.4	13.8	8.8	1.83			--	18.0
aromatic	%(v/v)	129	22.4	37.1	32.6	1.78			--	42.0
benzene	%(v/v)	129	0.4	1.1	0.8	0.1			--	1.0
OXYGEN CONTENT	%(m/m)	129	0.1	2.9	2.1	0.19			--	2.7
OXYGENATES:										
Methanol	%(v/v)	129	0.5	0.5	0.5				--	3
Ethanol	%(v/v)	129	0.5	1	0.5				--	5
Iso-propyl alcohol	%(v/v)	129	0.5	0.5	0.5				--	10
Tetro-butyl alcohol	%(v/v)	129	0.5	0.5	0.5				--	7
Iso-butyl alcohol	%(v/v)	129	0.5	0.5	0.5				--	10
Ethers with 5 or more C atoms per molecule	%(v/v)	129	0.2	13.5	11.5	1.14			--	15
Other oxygenate	%(v/v)	129	0.5	0.5	0.5				--	10
SULPHUR CONTENT	mg/kg	129	25	146	90.8	23.38			--	150
LEAD CONTENT	g/l								--	0.005

Notes:

Market Fuels used in vehicles with spark ingnition engines (Petrol)

Country: Finland

Year: 2001

FuelID: Unleaded petrol RON > 98

National Fuel Grade Unleaded Petrol 98

PARAMETER	Unit	Number of Samples	Min.	Max.	Mean	Standard deviation	National Specification Min.	National Specification Max.	EC Limit values Min.	EC Limit values Max.
RESEARCH OCTANE NO.	--	49	97.6	100.4	99.4	0.45			95	--
MOTOR OCTANE NO.	--	49	86.2	89	88.4	0.45			85	--
VAPOUR PRESSURE, DVP	kPa	54	58.6	90.9	72.4	7.15			--	70
Summer period	kPa	25	58.6	82.8	64.7	5.3		70	--	70
Winter period	kPa	29	62.3	90.9	80.4	8.8			--	--
DISTILLATTION:										
evaporated at 100	%(v/v)	49	46.4	69.4	51.9	5.3			46.0	--
evaporated at 150	%(v/v)	49	82.3	92.4	89	2.03			75.0	--
HYDROCARBON ANALYSIS:										
olefins	%(v/v)	46	4.3	13.1	7.4	1.73			--	18.0
aromatic	%(v/v)	46	28.9	37.2	31.8	1.7			--	42.0
benzene	%(v/v)	46	0.5	0.8	0.7	0.1			--	1.0
OXYGEN CONTENT	%(m/m)	46	2	2.8	2.3	0.2			--	2.7
OXYGENATES:										
Methanol	%(v/v)	46	0.5	0.5	0.5				--	3
Ethanol	%(v/v)	46	0.5	0.5	0.5				--	5
Iso-propyl alcohol	%(v/v)	46	0.5	0.5	0.5				--	10
Tetro-butyl alcohol	%(v/v)	46	0.5	0.5	0.5				--	7
Iso-butyl alcohol	%(v/v)	46	0.5	0.5	0.5				--	10
Ethers with 5 or more C atoms per molecule	%(v/v)	46	10.6	14.1	16.3	0.74			--	15
Other oxygenate	%(v/v)	46	0.5	0.5	0.5				--	10
SULPHUR CONTENT	mg/kg	54	14	110	43.6	16.58			--	150
LEAD CONTENT	g/l								--	0.005

Notes:

Market Fuels used in vehicles with spark ingnition engines (Petrol)

Country: France

Year: 2001

FuelID: Unleaded petrol min. RON=95

National Fuel Grade Unleaded 95

PARAMETER	Unit	Number of Samples	Min.	Max.	Mean	Standard deviation	National Specification Min.	National Specification Max.	EC Limit values Min.	EC Limit values Max.
RESEARCH OCTANE NO.	--								95	--
MOTOR OCTANE NO.	--								85	--
VAPOUR PRESSURE, DVP	kPa						45		--	60
Summer period	kPa								--	60
Winter period	kPa								--	--
DISTILLATTION:										
evaporated at 100	%(v/v)	42	45.5	60.8	52.6	3.9		71	46.0	--
evaporated at 150	%(v/v)	42	80.5	92.5	88.7	2.5			75.0	--
HYDROCARBON ANALYSIS:										
olefins	%(v/v)								--	18.0
aromatic	%(v/v)								--	42.0
benzene	%(v/v)	42	0.3	0.8	0.44	0.13			--	1.0
OXYGEN CONTENT	%(m/m)								--	2.7
OXYGENATES:										
Methanol	%(v/v)								--	3
Ethanol	%(v/v)								--	5
Iso-propyl alcohol	%(v/v)								--	10
Tetro-butyl alcohol	%(v/v)								--	7
Iso-butyl alcohol	%(v/v)								--	10
Ethers with 5 or more C atoms per molecule	%(v/v)								--	15
Other oxygenate	%(v/v)								--	10
SULPHUR CONTENT	mg/kg	42	40	210	103	24			--	150
LEAD CONTENT	g/l	9	0	0.0012	0.001	0.004			--	0.005

Notes:

Market Fuels used in vehicles with spark ingnition engines (Petrol)

Country: France

Year: 2001

FuelID: Unleaded petrol 95 =< RON < 98

National Fuel Grade Unleaded 98

PARAMETER	Unit	Number of Samples	Min.	Max.	Mean	Standard deviation	National Specification Min.	National Specification Max.	EC Limit values Min.	EC Limit values Max.
RESEARCH OCTANE NO.	--						97		95	--
MOTOR OCTANE NO.	--						86		85	--
VAPOUR PRESSURE, DVP	kPa						45		--	60
Summer period	kPa								--	60
Winter period	kPa								--	--
DISTILLATTION:										
evaporated at 100	%(v/v)	38	0.3	0.8	0.5	0.14		71	46.0	--
evaporated at 150	%(v/v)	38	83.5	92.6	88.1	2.6			75.0	--
HYDROCARBON ANALYSIS:										
olefins	%(v/v)								--	18.0
aromatic	%(v/v)								--	42.0
benzene	%(v/v)								--	1.0
OXYGEN CONTENT	%(m/m)								--	2.7
OXYGENATES:										
Methanol	%(v/v)								--	3
Ethanol	%(v/v)								--	5
Iso-propyl alcohol	%(v/v)								--	10
Tetro-butyl alcohol	%(v/v)								--	7
Iso-butyl alcohol	%(v/v)								--	10
Ethers with 5 or more C atoms per molecule	%(v/v)								--	15
Other oxygenate	%(v/v)								--	10
SULPHUR CONTENT	mg/kg	38	50	120	88	22			--	150
LEAD CONTENT	g/l	6	0	0	0	0	0	0	--	0.005

Notes:

Market Fuels used in vehicles with spark ingnition engines (Petrol)

Country: France

Year: 2001

FuelID: Unleaded petrol RON > 98

National Fuel Grade Super

PARAMETER	Unit	Number of Samples	Min.	Max.	Mean	Standard deviation	National Specification Min.	National Specification Max.	EC Limit values Min.	EC Limit values Max.
RESEARCH OCTANE NO.	--						98		95	--
MOTOR OCTANE NO.	--						88		85	--
VAPOUR PRESSURE, DVP	kPa						45		--	60
Summer period	kPa								--	60
Winter period	kPa								--	--
DISTILLATTION:										
evaporated at 100	%(v/v)	40	45	61.8	52.2	4.3		71	46.0	--
evaporated at 150	%(v/v)	40	83.5	93.8	88.3	2.7			75.0	--
HYDROCARBON ANALYSIS:										
olefins	%(v/v)								--	18.0
aromatic	%(v/v)								--	42.0
benzene	%(v/v)	40	0.2	4	0.55	0.58			--	1.0
OXYGEN CONTENT	%(m/m)								--	2.7
OXYGENATES:										
Methanol	%(v/v)								--	3
Ethanol	%(v/v)								--	5
Iso-propyl alcohol	%(v/v)								--	10
Tetro-butyl alcohol	%(v/v)								--	7
Iso-butyl alcohol	%(v/v)								--	10
Ethers with 5 or more C atoms per molecule	%(v/v)								--	15
Other oxygenate	%(v/v)								--	10
SULPHUR CONTENT	mg/kg	40	1	120	83	22			--	150
LEAD CONTENT	g/l								--	0.005

Notes:

Market Fuels used in vehicles with spark ingnition engines (Petrol)

Country: Germany

Year: 2001

FuelID: Regular unleaded petrol min. RON=91

National Fuel Grade Normal

PARAMETER	Unit	Number of Samples	Min.	Max.	Mean	Standard deviation	National Specification		EC Limit values	
							Min.	Max.	Min.	Max.
RESEARCH OCTANE NO.	--	24	91	94	92.9		91		95	--
MOTOR OCTANE NO.	--	107	82.4	83.5	82.8		82.5		85	--
VAPOUR PRESSURE, DVP	kPa								--	60
Summer period	kPa	35	55.8	63.1	58.1		60	90	--	60
Winter period	kPa	40	73	86.7	82.4		45		--	--
DISTILLATTION:										
evaporated at 100	%(v/v)	74	27	68.2	58.7				46.0	--
evaporated at 150	%(v/v)	74	50	96.6	85.9				75.0	--
HYDROCARBON ANALYSIS:										
olefins	%(v/v)	50	6.6	21.4	15.6			21	--	18.0
aromatic	%(v/v)	159	22.3	41.9	31				--	42.0
benzene	%(v/v)	248	0.42	1.09	0.78				--	1.0
OXYGEN CONTENT	%(m/m)	10	0	0.2	0.2				--	2.7
OXYGENATES:										
Methanol	%(v/v)	32	0	0	0				--	3
Ethanol	%(v/v)	32	0	0	0				--	5
Iso-propyl alcohol	%(v/v)	32	0	0.1	0				--	10
Tetro-butyl alcohol	%(v/v)	32	0	0.7	0				--	7
Iso-butyl alcohol	%(v/v)	32	0	0	0				--	10
Ethers with 5 or more C atoms per molecule	%(v/v)	37	0	0.8	0.43				--	15
Other oxygenate	%(v/v)	32	0	0.5	0.06				--	10
SULPHUR CONTENT	mg/kg	222	4	143	68.7				--	150
LEAD CONTENT	g/l	123	0.001	0.005	0				--	0.005

Notes:

Market Fuels used in vehicles with spark ingnition engines (Petrol)

Country: Germany

Year: 2001

FuelID: Regular unleaded petrol min. RON=91 (<50 ppm su

National Fuel Grade Normal

PARAMETER	Unit	Number of Samples	Min.	Max.	Mean	Standard deviation	National Specification Min.	National Specification Max.	EC Limit values Min.	EC Limit values Max.
RESEARCH OCTANE NO.	--	24	91	94	92.9		91		95	--
MOTOR OCTANE NO.	--	107	82.4	83.5	82.8		82.5		85	--
VAPOUR PRESSURE, DVP	kPa								--	60
Summer period	kPa	35	55.8	63.1	58.1		60	90	--	60
Winter period	kPa	40	73	86.7	82.4		45		--	--
DISTILLATTION:										
evaporated at 100	%(v/v)	74	27	68.2	58.7				46.0	--
evaporated at 150	%(v/v)	74	50	96.6	85.9				75.0	--
HYDROCARBON ANALYSIS:										
olefins	%(v/v)	50	6.6	21.4	15.6			21	--	18.0
aromatic	%(v/v)	159	22.3	41.9	31				--	42.0
benzene	%(v/v)	248	0.42	1.09	0.78				--	1.0
OXYGEN CONTENT	%(m/m)	10	0	0.2	0.2				--	2.7
OXYGENATES:										
Methanol	%(v/v)	32	0	0	0				--	3
Ethanol	%(v/v)	32	0	0	0				--	5
Iso-propyl alcohol	%(v/v)	32	0	0.1	0				--	10
Tetro-butyl alcohol	%(v/v)	32	0	0.7	0				--	7
Iso-butyl alcohol	%(v/v)	32	0	0	0				--	10
Ethers with 5 or more C atoms per molecule	%(v/v)	37	0	0.8	0.43				--	15
Other oxygenate	%(v/v)	32	0	0.5	0.06				--	10
SULPHUR CONTENT	mg/kg	222	4	143	68.7				--	150
LEAD CONTENT	g/l	123	0.001	0.005	0				--	0.005

Notes:

Market Fuels used in vehicles with spark ingnition engines (Petrol)

Country: Germany

Year: 2001

FuelID: Unleaded petrol min. RON=95

National Fuel Grade Super

PARAMETER	Unit	Number of Samples	Min.	Max.	Mean	Standard deviation	National Specification Min.	National Specification Max.	EC Limit values Min.	EC Limit values Max.
RESEARCH OCTANE NO.	--	31	95	96.7	95.7				95	--
MOTOR OCTANE NO.	--	184	84.7	86.4	85.1				85	--
VAPOUR PRESSURE, DVP	kPa								--	60
Summer period	kPa	88	50.4	63.3	58.4		60	90	--	60
Winter period	kPa	77	61.4	89.3	83.4		45		--	--
DISTILLATTION:										
evaporated at 100	%(v/v)	134	42	60.6	52.7				46.0	--
evaporated at 150	%(v/v)	110	78	95.8	86.2				75.0	--
HYDROCARBON ANALYSIS:										
olefins	%(v/v)	100	1.4	18.7	11.3				--	18.0
aromatic	%(v/v)	238	26	42.2	35.5				--	42.0
benzene	%(v/v)	365	0.3	1.09	0.71				--	1.0
OXYGEN CONTENT	%(m/m)	62	0	1.3	0.5				--	2.7
OXYGENATES:										
Methanol	%(v/v)	62	0	0.2	0				--	3
Ethanol	%(v/v)	62	0	0	0				--	5
Iso-propyl alcohol	%(v/v)	62	0	0.1	0				--	10
Tetro-butyl alcohol	%(v/v)	62	0	0.7	0.3				--	7
Iso-butyl alcohol	%(v/v)	62	0	0	0				--	10
Ethers with 5 or more C atoms per molecule	%(v/v)	72	0	7	3.03				--	15
Other oxygenate	%(v/v)	62	0	0	0				--	10
SULPHUR CONTENT	mg/kg	369	3	131	48.7				--	150
LEAD CONTENT	g/l	128	0.001	0.002	0				--	0.005

Notes:

Market Fuels used in vehicles with spark ingnition engines (Petrol)

Country: Germany

Year: 2001

FuelID: Unleaded petrol min. RON=95 (<50 ppm sulphur)

National Fuel Grade Super

PARAMETER	Unit	Number of Samples	Min.	Max.	Mean	Standard deviation	National Specification Min.	National Specification Max.	EC Limit values Min.	EC Limit values Max.
RESEARCH OCTANE NO.	--	31	95	96.7	95.7				95	--
MOTOR OCTANE NO.	--	184	84.7	86.4	85.1				85	--
VAPOUR PRESSURE, DVP	kPa								--	60
Summer period	kPa	88	50.4	63.3	58.4		60	90	--	60
Winter period	kPa	77	61.4	89.3	83.4		45	0	--	--
DISTILLATTION:										
evaporated at 100	%(v/v)	134	42	60.6	52.7				46.0	--
evaporated at 150	%(v/v)	110	78	95.8	86.2				75.0	--
HYDROCARBON ANALYSIS:										
olefins	%(v/v)	100	1.4	18.7	11.3				--	18.0
aromatic	%(v/v)	238	26	42.2	35.5				--	42.0
benzene	%(v/v)	365	0.3	1.09	0.71				--	1.0
OXYGEN CONTENT	%(m/m)	62	0	1.3	0.5				--	2.7
OXYGENATES:										
Methanol	%(v/v)	62	0	0.2	0				--	3
Ethanol	%(v/v)	62	0	0	0				--	5
Iso-propyl alcohol	%(v/v)	62	0	0	0				--	10
Tetro-butyl alcohol	%(v/v)	62	0	0.7	0.3				--	7
Iso-butyl alcohol	%(v/v)	62	0	0	0				--	10
Ethers with 5 or more C atoms per molecule	%(v/v)	72	0	7	3.03				--	15
Other oxygenate	%(v/v)	62	0	0	0				--	10
SULPHUR CONTENT	mg/kg	369	3	131	48.7				--	150
LEAD CONTENT	g/l	128	0	0.002	0				--	0.005

Notes:

Market Fuels used in vehicles with spark ingnition engines (Petrol)

Country: Germany

Year: 2001

FuelID: Unleaded petrol RON > 98 (<10 ppm sulphur)

National Fuel Grade Superplus

PARAMETER	Unit	Number of Samples	Min.	Max.	Mean	Standard deviation	National Specification Min.	National Specification Max.	EC Limit values Min.	EC Limit values Max.
RESEARCH OCTANE NO.	--	10	98	99.5	98.6		98		95	--
MOTOR OCTANE NO.	--	98	84.4	89.2	88		88		85	--
VAPOUR PRESSURE, DVP	kPa								--	60
Summer period	kPa	54	54.7	66.1	58.6		60	90	--	60
Winter period	kPa	35	68	90.6	80.7		45		--	--
DISTILLATTION:										
evaporated at 100	%(v/v)	47	46.2	55.7	52.1				46.0	--
evaporated at 150	%(v/v)	47	76	93.3	86.6				75.0	--
HYDROCARBON ANALYSIS:										
olefins	%(v/v)	26	0.8	8.6	2.9				--	18.0
aromatic	%(v/v)	92	27	42.1	37.6				--	42.0
benzene	%(v/v)	140	0.16	0.9	0.61				--	1.0
OXYGEN CONTENT	%(m/m)								--	2.7
OXYGENATES:										
Methanol	%(v/v)	26	0	0.1	0				--	3
Ethanol	%(v/v)	26	0	0	0				--	5
Iso-propyl alcohol	%(v/v)	26	0	0	0				--	10
Tetro-butyl alcohol	%(v/v)	26	0	0.3	0.06				--	7
Iso-butyl alcohol	%(v/v)	26	0	0	0				--	10
Ethers with 5 or more C atoms per molecule	%(v/v)	31	6.5	13.1	10.2				--	15
Other oxygenate	%(v/v)	26	0	0	0				--	10
SULPHUR CONTENT	mg/kg	137	3	64	11.3				--	150
LEAD CONTENT	g/l	62	0	0.001	0				--	0.005

Notes:

Market Fuels used in vehicles with spark ingnition engines (Petrol)

Country: Greece

Year: 2001

FuelID: Unleaded petrol min. RON=95

National Fuel Grade Unleaded 95

PARAMETER	Unit	Number of Samples	Min.	Max.	Mean	Standard deviation	National Specification Min.	National Specification Max.	EC Limit values Min.	EC Limit values Max.
RESEARCH OCTANE NO.	--	52	95	96.6	96	0.41	95		95	--
MOTOR OCTANE NO.	--	52	84.8	85.7	85	0.1	85		85	--
VAPOUR PRESSURE, DVP	kPa	52	55.9	60.3	58.5	1.69		60	--	60
Summer period	kPa								--	60
Winter period	kPa								--	--
DISTILLATTION:										
evaporated at 100	%(v/v)	52	51	68	57.6	2.88	46		46.0	--
evaporated at 150	%(v/v)	52	80	93	87.6	3.02	75		75.0	--
HYDROCARBON ANALYSIS:										
olefins	%(v/v)	52	6.6	15.2	8.8	1.84		18	--	18.0
aromatic	%(v/v)	52	24.1	37.9	32.9	2.01		42	--	42.0
benzene	%(v/v)	52	0.8	1	0.9	0.08		1	--	1.0
OXYGEN CONTENT	%(m/m)							2.7	--	2.7
OXYGENATES:										
Methanol	%(v/v)								--	3
Ethanol	%(v/v)								--	5
Iso-propyl alcohol	%(v/v)								--	10
Tetro-butyl alcohol	%(v/v)								--	7
Iso-butyl alcohol	%(v/v)								--	10
Ethers with 5 or more C atoms per molecule	%(v/v)	52	1.7	9	4	1.4			--	15
Other oxygenate	%(v/v)								--	10
SULPHUR CONTENT	mg/kg	52	20	150	109	33.57			--	150
LEAD CONTENT	g/l	52	0.002	0.004	0.002	0			--	0.005

Notes:

Market Fuels used in vehicles with spark ingnition engines (Petrol)

Country: Greece

Year: 2001

FuelID: Unleaded petrol 95 =< RON < 98

National Fuel Grade Unleaded 98

PARAMETER	Unit	Number of Samples	Min.	Max.	Mean	Standard deviation	National Specification Min.	National Specification Max.	EC Limit values Min.	EC Limit values Max.
RESEARCH OCTANE NO.	--	51	98	99.2	98.1	0.22	98		95	--
MOTOR OCTANE NO.	--	51	86	86.4	86.1	0.09	86		85	--
VAPOUR PRESSURE, DVP	kPa	51	53.1	60	58	2.06		60	--	60
Summer period	kPa								--	60
Winter period	kPa								--	--
DISTILLATTION:										
evaporated at 100	%(v/v)	51	47	65	57.4	3.09	46		46.0	--
evaporated at 150	%(v/v)	51	80	91	87.3	2.5	75		75.0	--
HYDROCARBON ANALYSIS:										
olefins	%(v/v)	51	8	16	9.1	2.28		18	--	18.0
aromatic	%(v/v)	51	27	42	34.3	4.19		42	--	42.0
benzene	%(v/v)	51	0.7	1	1	0.07		1	--	1.0
OXYGEN CONTENT	%(m/m)								--	2.7
OXYGENATES:										
Methanol	%(v/v)								--	3
Ethanol	%(v/v)								--	5
Iso-propyl alcohol	%(v/v)								--	10
Tetro-butyl alcohol	%(v/v)								--	7
Iso-butyl alcohol	%(v/v)								--	10
Ethers with 5 or more C atoms per molecule	%(v/v)	51	6	10	8.6	0.86		15	--	15
Other oxygenate	%(v/v)								--	10
SULPHUR CONTENT	mg/kg	51	10	150	97	39.51		150	--	150
LEAD CONTENT	g/l	51	0.002	0.004	0.002	0		0.005	--	0.005

Notes:

Market Fuels used in vehicles with spark ingnition engines (Petrol)

Country: Ireland

Year: 2001

FuelID: Unleaded petrol min. RON=95

National Fuel Grade Unleaded

PARAMETER	Unit	Number of Samples	Min.	Max.	Mean	Standard deviation	National Specification Min.	National Specification Max.	EC Limit values Min.	EC Limit values Max.
RESEARCH OCTANE NO.	--	79	94.6	98.8	95.8	0.92			95	--
MOTOR OCTANE NO.	--	79	84.9	89	85.8	0.85			85	--
VAPOUR PRESSURE, DVP	kPa	23	43.2	67	53.9	6.8		70	--	70
Summer period	kPa								--	70
Winter period	kPa								--	--
DISTILLATTION:										
evaporated at 100	%(v/v)	79	37.1	62	50.4	5.8			46.0	--
evaporated at 150	%(v/v)	79	78.4	96.1	88.6	3.8			75.0	--
HYDROCARBON ANALYSIS:										
olefins	%(v/v)	79	2	20.6	12.3	4.7			--	18.0
aromatic	%(v/v)	79	16.4	47.2	32.5	5.6			--	42.0
benzene	%(v/v)	79	0.1	1.1	0.64	0.23			--	1.0
OXYGEN CONTENT	%(m/m)	79	0	1.5	0.16	0.29			--	2.7
OXYGENATES:										
Methanol	%(v/v)	79	0	0.1	0	0			--	3
Ethanol	%(v/v)	79	0	0.1	0	0			--	5
Iso-propyl alcohol	%(v/v)	79	0	0.1	0	0			--	10
Tetro-butyl alcohol	%(v/v)	79	0	0.1	0	0			--	7
Iso-butyl alcohol	%(v/v)	79	0	0.1	0	0			--	10
Ethers with 5 or more C atoms per molecule	%(v/v)	79	0.1	8.1	1	1.6			--	15
Other oxygenate	%(v/v)	79	0.1	0	0	0			--	10
SULPHUR CONTENT	mg/kg	79	0	189	83	51			--	150
LEAD CONTENT	g/l	0	0	0.001	0	0			--	0.005

Notes:

Market Fuels used in vehicles with spark ingnition engines (Petrol)

Country: Ireland

Year: 2001

FuelID: Unleaded petrol min. RON=95 (<50 ppm sulphur)

National Fuel Grade Unleaded

PARAMETER	Unit	Number of Samples	Min.	Max.	Mean	Standard deviation	National Specification Min.	National Specification Max.	EC Limit values Min.	EC Limit values Max.
RESEARCH OCTANE NO.	--	79	94.6	98.8	95.8	0.92			95	--
MOTOR OCTANE NO.	--	79	84.9	89	85.8	0.85			85	--
VAPOUR PRESSURE, DVP	kPa	23	43.2	67	53.9	6.8		70	--	70
Summer period	kPa								--	70
Winter period	kPa								--	--
DISTILLATTION:										
evaporated at 100	%(v/v)	79	37.1	62	50.4	5.8			46.0	--
evaporated at 150	%(v/v)	79	78.4	96.1	88.6	3.8			75.0	--
HYDROCARBON ANALYSIS:										
olefins	%(v/v)	79	2	20.6	12.3	4.7			--	18.0
aromatic	%(v/v)	79	16.4	47.2	32.5	5.6			--	42.0
benzene	%(v/v)	79	0.1	1.1	0.64	0.23			--	1.0
OXYGEN CONTENT	%(m/m)	79	0	1.5	0.16	0.29			--	2.7
OXYGENATES:										
Methanol	%(v/v)	79	0	0.1	0	0			--	3
Ethanol	%(v/v)	79	0	0.1	0	0			--	5
Iso-propyl alcohol	%(v/v)	79	0	0.1	0	0			--	10
Tetro-butyl alcohol	%(v/v)	79	0	0.1	0	0			--	7
Iso-butyl alcohol	%(v/v)	79	0	0.1	0	0			--	10
Ethers with 5 or more C atoms per molecule	%(v/v)	79	0.1	8.1	1	1.6			--	15
Other oxygenate	%(v/v)	79	0.1	0	0	0			--	10
SULPHUR CONTENT	mg/kg	79	0	189	83	51			--	150
LEAD CONTENT	g/l	79	0	0.001	0	0			--	0.005

Notes:

Market Fuels used in vehicles with spark ingnition engines (Petrol)

Country: Ireland

Year: 2001

FuelID: Unleaded petrol min. RON=95 (<10 ppm sulphur)

National Fuel Grade Unleaded

PARAMETER	Unit	Number of Samples	Min.	Max.	Mean	Standard deviation	National Specification Min.	National Specification Max.	EC Limit values Min.	EC Limit values Max.
RESEARCH OCTANE NO.	--	79	94.6	98.8	95.8	0.92			95	--
MOTOR OCTANE NO.	--	79	84.9	89	85.8	0.85			85	--
VAPOUR PRESSURE, DVP	kPa	23	43.2	67	53.9	6.8		70	--	70
Summer period	kPa								--	70
Winter period	kPa								--	--
DISTILLATTION:										
evaporated at 100	%(v/v)	79	37.1	62	50.4	5.8			46.0	--
evaporated at 150	%(v/v)	79	78.4	96.1	88.6	3.8			75.0	--
HYDROCARBON ANALYSIS:										
olefins	%(v/v)	79	2	20.6	12.3	4.7			--	18.0
aromatic	%(v/v)	79	16.4	47.2	32.5	5.6			--	42.0
benzene	%(v/v)	79	0.1	1.1	0.64	0.23			--	1.0
OXYGEN CONTENT	%(m/m)	79	0	1.5	0.16	0.29			--	2.7
OXYGENATES:										
Methanol	%(v/v)	79	0	0.1	0	0			--	3
Ethanol	%(v/v)	79	0	0.1	0	0			--	5
Iso-propyl alcohol	%(v/v)	79	0	0.1	0	0			--	10
Tetro-butyl alcohol	%(v/v)	79	0	0.1	0	0			--	7
Iso-butyl alcohol	%(v/v)	79	0	0.1	0	0			--	10
Ethers with 5 or more C atoms per molecule	%(v/v)	79	0.1	8.1	1	1.6			--	15
Other oxygenate	%(v/v)	79	0.1	0	0	0			--	10
SULPHUR CONTENT	mg/kg	79	0	189	83	51			--	150
LEAD CONTENT	g/l	79	0	0.001	0	0			--	0.005

Notes:

Market Fuels used in vehicles with spark ingnition engines (Petrol)

Country: Ireland

Year: 2001

FuelID: Unleaded petrol 95 =< RON < 98

National Fuel Grade Unleaded

PARAMETER	Unit	Number of Samples	Min.	Max.	Mean	Standard deviation	National Specification Min.	National Specification Max.	EC Limit values Min.	EC Limit values Max.
RESEARCH OCTANE NO.	--	79	94.6	98.8	95.8	0.92			95	--
MOTOR OCTANE NO.	--	79	84.9	89	85.8	0.85			85	--
VAPOUR PRESSURE, DVP	kPa	23	43.2	67	53.9	6.8		70	--	70
Summer period	kPa								--	70
Winter period	kPa								--	--
DISTILLATTION:										
evaporated at 100	%(v/v)	79	37.1	62	50.4	5.8			46.0	--
evaporated at 150	%(v/v)	79	78.4	96.1	88.6	3.8			75.0	--
HYDROCARBON ANALYSIS:										
olefins	%(v/v)	79	2	20.6	12.3	4.7			--	18.0
aromatic	%(v/v)	79	16.4	47.2	32.5	5.6			--	42.0
benzene	%(v/v)	79	0.1	1.1	0.64	0.23			--	1.0
OXYGEN CONTENT	%(m/m)	79	0	1.5	0.16	0.29			--	2.7
OXYGENATES:										
Methanol	%(v/v)	79	0	0.1	0	0			--	3
Ethanol	%(v/v)	79	0	0.1	0	0			--	5
Iso-propyl alcohol	%(v/v)	79	0	0.1	0	0			--	10
Tetro-butyl alcohol	%(v/v)	79	0	0.1	0	0			--	7
Iso-butyl alcohol	%(v/v)	79	0	0.1	0	0			--	10
Ethers with 5 or more C atoms per molecule	%(v/v)	79	0.1	8.1	1	1.6			--	15
Other oxygenate	%(v/v)	79	0.1	0	0	0			--	10
SULPHUR CONTENT	mg/kg	79	0	189	83	51			--	150
LEAD CONTENT	g/l	79	0	0.001	0	0			--	0.005

Notes:

Market Fuels used in vehicles with spark ingnition engines (Petrol)

Country: Italy

Year: 2001

FuelID: Unleaded petrol min. RON=95

National Fuel Grade Unleaded 95

PARAMETER	Unit	Number of Samples	Min.	Max.	Mean	Standard deviation	National Specification Min.	National Specification Max.	EC Limit values Min.	EC Limit values Max.
RESEARCH OCTANE NO.	--	223	93.6	98.7	95.6	0.63	95		95	--
MOTOR OCTANE NO.	--	223	82	87.3	85.4	0.62	85		85	--
VAPOUR PRESSURE, DVP	kPa	197	50.9	85.4	67.3	4.83			--	60
Summer period	kPa	59	50.9	65.7	57.3	2.5	45	60	--	60
Winter period	kPa	138	51.3	85.4	71.5	5.54	60	90	--	--
DISTILLATTION:										
evaporated at 100	%(v/v)	225	42	70	54.3	5.4	46	71	46.0	--
evaporated at 150	%(v/v)	161	77	95	87.8	3.95	75		75.0	--
HYDROCARBON ANALYSIS:										
olefins	%(v/v)	225	0.5	23.8	9.1	5.26		18	--	18.0
aromatic	%(v/v)	225	16.2	40.8	33	4.27		40	--	42.0
benzene	%(v/v)	225	0.2	1	0.74	0.16		1	--	1.0
OXYGEN CONTENT	%(m/m)	221	0	3	0.5	0.55		2.7	--	2.7
OXYGENATES:										
Methanol	%(v/v)							3	--	3
Ethanol	%(v/v)							5	--	5
Iso-propyl alcohol	%(v/v)							10	--	10
Tetro-butyl alcohol	%(v/v)							7	--	7
Iso-butyl alcohol	%(v/v)							10	--	10
Ethers with 5 or more C atoms per molecule	%(v/v)	221	0	16.8	3	3.05		15	--	15
Other oxygenate	%(v/v)							10	--	10
SULPHUR CONTENT	mg/kg	179	1	199	61.1	34.93		150	--	150
LEAD CONTENT	g/l	225	0.001	0.002	0	0		0.005	--	0.005

Notes:

Market Fuels used in vehicles with spark ingnition engines (Petrol)

Country: Luxembourg

Year: 2001

FuelID: Unleaded petrol min. RON=95

National Fuel Grade Eurosuper

PARAMETER	Unit	Number of Samples	Min.	Max.	Mean	Standard deviation	National Specification Min.	National Specification Max.	EC Limit values Min.	EC Limit values Max.
RESEARCH OCTANE NO.	--	4	97.01	97.5	97.3				95	--
MOTOR OCTANE NO.	--	4	85.01	85.3	85.2				85	--
VAPOUR PRESSURE, DVP	kPa								--	60
Summer period	kPa	2	56.3	58.1	57.2				--	60
Winter period	kPa	2	80.5	85.5	83				--	--
DISTILLATTION:										
evaporated at 100	%(v/v)	5	49.5	51	50.3				46.0	--
evaporated at 150	%(v/v)	5	85.2	89.1	87.2				75.0	--
HYDROCARBON ANALYSIS:										
olefins	%(v/v)								--	18.0
aromatic	%(v/v)								--	42.0
benzene	%(v/v)	4	0.601	0.74	0.67				--	1.0
OXYGEN CONTENT	%(m/m)								--	2.7
OXYGENATES:										
Methanol	%(v/v)								--	3
Ethanol	%(v/v)								--	5
Iso-propyl alcohol	%(v/v)								--	10
Tetro-butyl alcohol	%(v/v)								--	7
Iso-butyl alcohol	%(v/v)								--	10
Ethers with 5 or more C atoms per molecule	%(v/v)								--	15
Other oxygenate	%(v/v)								--	10
SULPHUR CONTENT	mg/kg	4	10	27.3	18.65				--	150
LEAD CONTENT	g/l	4	2.5	5	0				--	0.005

Notes:

Market Fuels used in vehicles with spark ingnition engines (Petrol)

Country: Luxembourg

Year: 2001

FuelID: Unleaded petrol RON > 98

National Fuel Grade Super Lead subsitute

PARAMETER	Unit	Number of Samples	Min.	Max.	Mean	Standard deviation	National Specification Min.	National Specification Max.	EC Limit values Min.	EC Limit values Max.
RESEARCH OCTANE NO.	--	2	99.5	99.6	99.6				95	--
MOTOR OCTANE NO.	--	2	88	88.1	88.1				85	--
VAPOUR PRESSURE, DVP	kPa	1							--	60
Summer period	kPa								--	60
Winter period	kPa								--	--
DISTILLATTION:										
evaporated at 100	%(v/v)	1	49.7		51				46.0	--
evaporated at 150	%(v/v)	1	85.1		85.2				75.0	--
HYDROCARBON ANALYSIS:										
olefins	%(v/v)	2							--	18.0
aromatic	%(v/v)	2							--	42.0
benzene	%(v/v)	1	0.5	0.4	0.5				--	1.0
OXYGEN CONTENT	%(m/m)	2							--	2.7
OXYGENATES:										
Methanol	%(v/v)	2							--	3
Ethanol	%(v/v)	2							--	5
Iso-propyl alcohol	%(v/v)	2							--	10
Tetro-butyl alcohol	%(v/v)	2							--	7
Iso-butyl alcohol	%(v/v)	2							--	10
Ethers with 5 or more C atoms per molecule	%(v/v)	2							--	15
Other oxygenate	%(v/v)	2							--	10
SULPHUR CONTENT	mg/kg	2	10	30.9	20.45				--	150
LEAD CONTENT	g/l	2	2.5	5	3.75				--	0.005

Notes:

Market Fuels used in vehicles with spark ingnition engines (Petrol)

Country: Luxembourg

Year: 2001

FuelID: Unleaded petrol RON > 98 (<50 ppm sulphur)

National Fuel Grade Superplus

PARAMETER	Unit	Number of Samples	Min.	Max.	Mean	Standard deviation	National Specification Min.	National Specification Max.	EC Limit values Min.	EC Limit values Max.
RESEARCH OCTANE NO.	--	5	99.4	100.6	100.1				95	--
MOTOR OCTANE NO.	--	5	88.01	88.4	88.2				85	--
VAPOUR PRESSURE, DVP	kPa								--	60
Summer period	kPa	2	66.6	80.5	73.6				--	60
Winter period	kPa	3	76.6	86.8	80.2				--	--
DISTILLATTION:										
evaporated at 100	%(v/v)	5	49.9	51.7	50.8				46.0	--
evaporated at 150	%(v/v)	5	82.3	83.55	82.9				75.0	--
HYDROCARBON ANALYSIS:										
olefins	%(v/v)								--	18.0
aromatic	%(v/v)								--	42.0
benzene	%(v/v)	5	0.38	0.501	0.42				--	1.0
OXYGEN CONTENT	%(m/m)								--	2.7
OXYGENATES:										
Methanol	%(v/v)								--	3
Ethanol	%(v/v)								--	5
Iso-propyl alcohol	%(v/v)								--	10
Tetro-butyl alcohol	%(v/v)								--	7
Iso-butyl alcohol	%(v/v)								--	10
Ethers with 5 or more C atoms per molecule	%(v/v)								--	15
Other oxygenate	%(v/v)								--	10
SULPHUR CONTENT	mg/kg	5	5	20	12				--	150
LEAD CONTENT	g/l	5	2.5	5					--	0.005

Notes:

Market Fuels used in vehicles with spark ingnition engines (Petrol)

Country: Netherlands

Year: 2001

FuelID: Unleaded petrol min. RON=95

National Fuel Grade Unleaded 95

PARAMETER	Unit	Number of Samples	Min.	Max.	Mean	Standard deviation	National Specification Min.	National Specification Max.	EC Limit values Min.	EC Limit values Max.
RESEARCH OCTANE NO.	--	23	95	99.3	97.1				95	--
MOTOR OCTANE NO.	--	23	85	88	86.1				85	--
VAPOUR PRESSURE, DVP	kPa	23							--	60
Summer period	kPa								--	60
Winter period	kPa								--	--
DISTILLATTION:										
evaporated at 100	%(v/v)	23	46.5	59.6	53.4				46.0	--
evaporated at 150	%(v/v)	23	80.1	95.7	87.5				75.0	--
HYDROCARBON ANALYSIS:										
olefins	%(v/v)	23	3.5	13.9	7.3				--	18.0
aromatic	%(v/v)	23	21.5	44.8	35.9				--	42.0
benzene	%(v/v)	23	0.2	0.9	0.7				--	1.0
OXYGEN CONTENT	%(m/m)	23							--	2.7
OXYGENATES:										
Methanol	%(v/v)	23			0.1				--	3
Ethanol	%(v/v)	23			0.1				--	5
Iso-propyl alcohol	%(v/v)	23			0.1				--	10
Tetro-butyl alcohol	%(v/v)	23			0.1				--	7
Iso-butyl alcohol	%(v/v)	23			0.1				--	10
Ethers with 5 or more C atoms per molecule	%(v/v)	23	0.1	10.5	4.2				--	15
Other oxygenate	%(v/v)	23			0.1				--	10
SULPHUR CONTENT	mg/kg	23	7	110	51				--	150
LEAD CONTENT	g/l	23			1				--	0.005

Notes:

Market Fuels used in vehicles with spark ingnition engines (Petrol)

Country: Netherlands

Year: 2001

FuelID: Unleaded petrol RON > 98

National Fuel Grade Unleaded 98

PARAMETER	Unit	Number of Samples	Min.	Max.	Mean	Standard deviation	National Specification Min.	National Specification Max.	EC Limit values Min.	EC Limit values Max.
RESEARCH OCTANE NO.	--	23	95	99.3	97.1				95	--
MOTOR OCTANE NO.	--	23	85	88	86.1				85	--
VAPOUR PRESSURE, DVP	kPa	23							--	60
Summer period	kPa								--	60
Winter period	kPa								--	--
DISTILLATTION:										
evaporated at 100	%(v/v)	23	46.5	59.6	53.4				46.0	--
evaporated at 150	%(v/v)	23	80.1	95.7	87.5				75.0	--
HYDROCARBON ANALYSIS:										
olefins	%(v/v)	23	3.5	13.9	7.3				--	18.0
aromatic	%(v/v)	23	21.5	44.8	35.9				--	42.0
benzene	%(v/v)	23	0.2	0.9	0.7				--	1.0
OXYGEN CONTENT	%(m/m)	23							--	2.7
OXYGENATES:										
Methanol	%(v/v)	23			0.1				--	3
Ethanol	%(v/v)	23			0.1				--	5
Iso-propyl alcohol	%(v/v)	23			0.1				--	10
Tetro-butyl alcohol	%(v/v)	23			0.1				--	7
Iso-butyl alcohol	%(v/v)	23			0.1				--	10
Ethers with 5 or more C atoms per molecule	%(v/v)	23	0.1	10.5	4.2				--	15
Other oxygenate	%(v/v)	23							--	10
SULPHUR CONTENT	mg/kg	23	7	110	51				--	150
LEAD CONTENT	g/l	23			1				--	0.005

Notes:

Market Fuels used in vehicles with spark ingnition engines (Petrol)

Country: Portugal

Year: 2001

FuelID: Unleaded petrol 95 =< RON < 98

National Fuel Grade Eurosuper

PARAMETER	Unit	Number of Samples	Min.	Max.	Mean	Standard deviation	National Specification Min.	National Specification Max.	EC Limit values Min.	EC Limit values Max.
RESEARCH OCTANE NO.	--	17	96	98	96.2	0.31	95		95	--
MOTOR OCTANE NO.	--	17	85	85	85	0	85		85	--
VAPOUR PRESSURE, DVP	kPa	17	54.2	89.6	71.3	7.1	45	60	--	60
Summer period	kPa	7	54.2	79.3	61.1	8.2	45	60	--	60
Winter period	kPa	10	71.1	89.6	78.4	6.7	60	90	--	--
DISTILLATTION:										
evaporated at 100	%(v/v)	17	45.5	54	48.1	1.99	46	71	46.0	--
evaporated at 150	%(v/v)	17	76.9	88	84.3	2.92	75		75.0	--
HYDROCARBON ANALYSIS:										
olefins	%(v/v)	12	10.3	15.4	13	1.51		18	--	18.0
aromatic	%(v/v)	12	33.5	41.9	39.4	2.33		42	--	42.0
benzene	%(v/v)	12	0.6	1.1	0.9	0.1		1	--	1.0
OXYGEN CONTENT	%(m/m)	12	0	1.2	0.3	0.37		3	--	2.7
OXYGENATES:										
Methanol	%(v/v)							3	--	3
Ethanol	%(v/v)							5	--	5
Iso-propyl alcohol	%(v/v)							10	--	10
Tetro-butyl alcohol	%(v/v)							7	--	7
Iso-butyl alcohol	%(v/v)							10	--	10
Ethers with 5 or more C atoms per molecule	%(v/v)	8	0	6	1.2	0.38		15	--	15
Other oxygenate	%(v/v)							10	--	10
SULPHUR CONTENT	mg/kg	17	300	500	460.4	58.87		150	--	150
LEAD CONTENT	g/l	7	0	0.005	0	0			--	0.005

Notes:

Market Fuels used in vehicles with spark ingnition engines (Petrol)

Country: Portugal

Year: 2001

FuelID: Unleaded petrol RON > 98

National Fuel Grade Superplus

PARAMETER	Unit	Number of Samples	Min.	Max.	Mean	Standard deviation	National Specification Min.	National Specification Max.	EC Limit values Min.	EC Limit values Max.
RESEARCH OCTANE NO.	--	20	98	99	98.2	0.47	98		95	--
MOTOR OCTANE NO.	--	20	87	87.5	87	0.11	87		85	--
VAPOUR PRESSURE, DVP	kPa	20	54.1	86.9	71.4	5.95	45	60	--	60
Summer period	kPa	9	54.1	77.7	60.2	6.9	45	60	--	60
Winter period	kPa	11	70.1	86.9	80.6	5.4	60	90	--	--
DISTILLATTION:										
evaporated at 100	%(v/v)	20	46	53	47.7	1.73	46	71	46.0	--
evaporated at 150	%(v/v)	20	79.3	89.5	85.5	2.25	75		75.0	--
HYDROCARBON ANALYSIS:										
olefins	%(v/v)	20	5.8	14.6	10.9	2.16		18	--	18.0
aromatic	%(v/v)	20	30.2	41.9	36.7	3.53		42	--	42.0
benzene	%(v/v)	20	0.5	1	0.8	0.11		1	--	1.0
OXYGEN CONTENT	%(m/m)	20	0.1	2.2	1.2	0.53		3	--	2.7
OXYGENATES:										
Methanol	%(v/v)							3	--	3
Ethanol	%(v/v)							5	--	5
Iso-propyl alcohol	%(v/v)							10	--	10
Tetro-butyl alcohol	%(v/v)							7	--	7
Iso-butyl alcohol	%(v/v)							10	--	10
Ethers with 5 or more C atoms per molecule	%(v/v)	18	0.5	12	6.7	2.9		15	--	15
Other oxygenate	%(v/v)							10	--	10
SULPHUR CONTENT	mg/kg	20	300	500	418.3	57.47		150	--	150
LEAD CONTENT	g/l	8	0	0.005	0	0			--	0.005

Notes:

Market Fuels used in vehicles with spark ingnition engines (Petrol)

Country: Spain

Year: 2001

FuelID: Unleaded petrol min. RON=95

National Fuel Grade Unleaded 95

PARAMETER	Unit	Number of Samples	Min.	Max.	Mean	Standard deviation	National Specification Min.	National Specification Max.	EC Limit values Min.	EC Limit values Max.
RESEARCH OCTANE NO.	--	204	95	96.9	96	0.5	95		95	--
MOTOR OCTANE NO.	--	204	85	86.3	85.2	0.2	85		85	--
VAPOUR PRESSURE, DVP	kPa	204	45.2	79.5	65.6	5.22	45	60	--	60
Summer period	kPa	102	45.2	60	57.5	2.7	45	60	--	60
Winter period	kPa	102	55.4	79.5	70.1	6.2	50	80	--	--
DISTILLATTION:										
evaporated at 100	%(v/v)	204	46	68.7	53.7	5.38	46	71	46.0	--
evaporated at 150	%(v/v)	204	79	95.4	89.8	3.95	75		75.0	--
HYDROCARBON ANALYSIS:										
olefins	%(v/v)	204	5	18	12.8	3.36		18	--	18.0
aromatic	%(v/v)	204	23.5	42	34.3	6.01		42	--	42.0
benzene	%(v/v)	204	0.5	1	0.9	0.2		1	--	1.0
OXYGEN CONTENT	%(m/m)	204	0.1	3.1	0.6	0.38		2.7	--	2.7
OXYGENATES:										
Methanol	%(v/v)	204	0	0	0	0		3	--	3
Ethanol	%(v/v)	204	0	0.3	0	0		5	--	5
Iso-propyl alcohol	%(v/v)	204	0	0	0	0		10	--	10
Tetro-butyl alcohol	%(v/v)	204	0	0.3	0	0		7	--	7
Iso-butyl alcohol	%(v/v)	204	0	0	0	0		10	--	10
Ethers with 5 or more C atoms per molecule	%(v/v)	204	0.2	15	3	2.02		15	--	15
Other oxygenate	%(v/v)	204	0	0.2	0	0		10	--	10
SULPHUR CONTENT	mg/kg	204	10	150	96.4	47.25		150	--	150
LEAD CONTENT	g/l	204	0	0.004	0.001	0.001		0.005	--	0.005

Notes:

Market Fuels used in vehicles with spark ingnition engines (Petrol)

Country: Spain

Year: 2001

FuelID: Unleaded petrol 95 =< RON < 98

National Fuel Grade Unleaded 97

PARAMETER	Unit	Number of Samples	Min.	Max.	Mean	Standard deviation	National Specification Min.	National Specification Max.	EC Limit values Min.	EC Limit values Max.
RESEARCH OCTANE NO.	--	99	97	97.8	97.3	0.4	97		95	--
MOTOR OCTANE NO.	--	99	85	87.3	85.7	0.4	85		85	--
VAPOUR PRESSURE, DVP	kPa	99	50	78.8	67.5	6.5	50	80	--	60
Summer period	kPa								--	60
Winter period	kPa	99	50	78.8	67.5	6.5	50	80	--	--
DISTILLATTION:										
evaporated at 100	%(v/v)	99	46.8	68.8	55.1	6.8	46	71	46.0	--
evaporated at 150	%(v/v)	99	80.3	94.8	90.3	4	75		75.0	--
HYDROCARBON ANALYSIS:										
olefins	%(v/v)	99	8.5	18	13.9	2.9		18	--	18.0
aromatic	%(v/v)	99	22	42	33	6.2		42	--	42.0
benzene	%(v/v)	99	0.6	1	0.8	0.2		1	--	1.0
OXYGEN CONTENT	%(m/m)	99	0.1	3.1	1	0.6		2.7	--	2.7
OXYGENATES:										
Methanol	%(v/v)	99	0	0	0	0		3	--	3
Ethanol	%(v/v)	99	0	0.2	0	0.1		5	--	5
Iso-propyl alcohol	%(v/v)	99	0	0	0	0		10	--	10
Tetro-butyl alcohol	%(v/v)	99	0	0.3	0	0.1		7	--	7
Iso-butyl alcohol	%(v/v)	99	0	0	0	0		10	--	10
Ethers with 5 or more C atoms per molecule	%(v/v)	99	0.8	15	5.8	3.2		15	--	15
Other oxygenate	%(v/v)	99	0	0.2	0	0.1		10	--	10
SULPHUR CONTENT	mg/kg	99	20	150	102	39		150	--	150
LEAD CONTENT	g/l	99	0	0.004	0.001	0.001		0.005	--	0.005

Notes:

Market Fuels used in vehicles with spark ingnition engines (Petrol)

Country: Spain

Year: 2001

FuelID: Unleaded petrol RON > 98

National Fuel Grade Unleaded 98

PARAMETER	Unit	Number of Samples	Min.	Max.	Mean	Standard deviation	National Specification Min.	National Specification Max.	EC Limit values Min.	EC Limit values Max.
RESEARCH OCTANE NO.	--	192	98	99.8	98.9	0.4	95		95	--
MOTOR OCTANE NO.	--	192	84.2	97.1	87.3	1.1	85		85	--
VAPOUR PRESSURE, DVP	kPa	192	50	80	62.7	6.44	45	60	--	60
Summer period	kPa	96	56	60	57.4	6.2	45	60	--	60
Winter period	kPa	96	50	80	67.9	6.7	50	80	--	--
DISTILLATTION:										
evaporated at 100	%(v/v)	192	46	65	53.9	5.24	46	71	46.0	--
evaporated at 150	%(v/v)	192	75	95.4	89	4.64	75		75.0	--
HYDROCARBON ANALYSIS:										
olefins	%(v/v)	192	5.4	17.9	11.8	3.45		18	--	18.0
aromatic	%(v/v)	192	22.1	42	34.8	6.24		42	--	42.0
benzene	%(v/v)	192	0.3	1	0.8	0.2		1	--	1.0
OXYGEN CONTENT	%(m/m)	192	0.1	3	1.8	0.5		2.7	--	2.7
OXYGENATES:										
Methanol	%(v/v)	192	0	0	0	0		3	--	3
Ethanol	%(v/v)	192	0	0.6	0.1	0.1		5	--	5
Iso-propyl alcohol	%(v/v)	192	0	0	0	0		10	--	10
Tetro-butyl alcohol	%(v/v)	102	0	0.4	0	0.1		7	--	7
Iso-butyl alcohol	%(v/v)	192	0	0	0	0		10	--	10
Ethers with 5 or more C atoms per molecule	%(v/v)	192	4	15	10.4	2.5		15	--	15
Other oxygenate	%(v/v)	192	0	0.8	0	0.1		10	--	10
SULPHUR CONTENT	mg/kg	192	10	150	79	50		150	--	150
LEAD CONTENT	g/l	192	0	0.004	0.001	0.001		0.005	--	0.005

Notes:

Market Fuels used in vehicles with spark ingnition engines (Petrol)

Country: Sweden

Year: 2001

FuelID: Unleaded petrol min. RON=95 (<50 ppm sulphur)

National Fuel Grade Unleaded 95 <50ppm S

PARAMETER	Unit	Number of Samples	Min.	Max.	Mean	Standard deviation	National Specification Min.	National Specification Max.	EC Limit values Min.	EC Limit values Max.
RESEARCH OCTANE NO.	--	739	95	97.6	95.2		95		95	--
MOTOR OCTANE NO.	--	739	85	87.5	85.2		85		85	--
VAPOUR PRESSURE, DVP	kPa	739	58.5	95	81.3		45	95	--	70
Summer period	kPa								--	70
Winter period	kPa								--	--
DISTILLATTION:										
evaporated at 100	%(v/v)	739	47	66.5	53.3		47	71	46.0	--
evaporated at 150	%(v/v)	739	75	97	85.8		75		75.0	--
HYDROCARBON ANALYSIS:										
olefins	%(v/v)	739	0	13	5.3			13	--	18.0
aromatic	%(v/v)	739	27.7	41.9	37.6			42	--	42.0
benzene	%(v/v)	739	0.4	1	0.78			1	--	1.0
OXYGEN CONTENT	%(m/m)	739	0	2.7	0.2			2.7	--	2.7
OXYGENATES:										
Methanol	%(v/v)							3	--	3
Ethanol	%(v/v)		0	5	0			5	--	5
Iso-propyl alcohol	%(v/v)							10	--	10
Tetro-butyl alcohol	%(v/v)							7	--	7
Iso-butyl alcohol	%(v/v)							10	--	10
Ethers with 5 or more C atoms per molecule	%(v/v)		0	15	0.7			15	--	15
Other oxygenate	%(v/v)		0	2.9	0.06			10	--	10
SULPHUR CONTENT	mg/kg	739	0.5	50	22			50	--	150
LEAD CONTENT	g/l	739	0.001	0.005	0.001			0.005	--	0.005

Notes:

Market Fuels used in vehicles with spark ingnition engines (Petrol)

Country: Sweden

Year: 2001

FuelID: Unleaded petrol RON > 98

National Fuel Grade Unleaded 98

PARAMETER	Unit	Number of Samples	Min.	Max.	Mean	Standard deviation	National Specification Min.	National Specification Max.	EC Limit values Min.	EC Limit values Max.
RESEARCH OCTANE NO.	--	200	98	100.2	98.4		98		95	--
MOTOR OCTANE NO.	--	200	87.5	88.8	87.6		80		85	--
VAPOUR PRESSURE, DVP	kPa	200	60	95	78.8		45	95	--	70
Summer period	kPa								--	70
Winter period	kPa								--	--
DISTILLATTION:										
evaporated at 100	%(v/v)	200	47	64	52.4		47	71	46.0	--
evaporated at 150	%(v/v)	200	75	94	83.7		75		75.0	--
HYDROCARBON ANALYSIS:										
olefins	%(v/v)	200	0.3	13	6.1			13	--	18.0
aromatic	%(v/v)	200	31.6	42	38.7			42	--	42.0
benzene	%(v/v)	200	0.3	1	0.72			1	--	1.0
OXYGEN CONTENT	%(m/m)	200	0.1	2.7	0.9			2.7	--	2.7
OXYGENATES:										
Methanol	%(v/v)							3	--	3
Ethanol	%(v/v)		0	0.1	0			5	--	5
Iso-propyl alcohol	%(v/v)							10	--	10
Tetro-butyl alcohol	%(v/v)							7	--	7
Iso-butyl alcohol	%(v/v)							10	--	10
Ethers with 5 or more C atoms per molecule	%(v/v)		0.1	14.2	5			15	--	15
Other oxygenate	%(v/v)							10	--	10
SULPHUR CONTENT	mg/kg	200	1	48	12			50	--	150
LEAD CONTENT	g/l	200	0.001	0.005	0.002			0.005	--	0.005

Notes:

Market Fuels used in vehicles with spark ingnition engines (Petrol)

Country: UK

Year: 2001

FuelID: Unleaded petrol min. RON=95

National Fuel Grade Premium Unleaded

PARAMETER	Unit	Number of Samples	Min.	Max.	Mean	Standard deviation	National Specification Min.	National Specification Max.	EC Limit values Min.	EC Limit values Max.
RESEARCH OCTANE NO.	--	2210	95	97.8	95.3	0.5			95	--
MOTOR OCTANE NO.	--	2210	85	87.7	85.4	0.4			85	--
VAPOUR PRESSURE, DVP	kPa	404	52.5	70	68.8	2.6			--	70
Summer period	kPa	404	52.5	70	68.8	2.6			--	70
Winter period	kPa								--	--
DISTILLATTION:										
evaporated at 100	%(v/v)	2071	46	71	56.8	4			46.0	--
evaporated at 150	%(v/v)	1574	81	98.6	90.3	2.2			75.0	--
HYDROCARBON ANALYSIS:										
olefins	%(v/v)	1601	0.6	18	9.7	2.2			--	18.0
aromatic	%(v/v)	2124	15.8	40.2	29	2.5			--	42.0
benzene	%(v/v)	2188	0.1	1	0.7	0.15			--	1.0
OXYGEN CONTENT	%(m/m)	765	0	1.6	0.2	0.2			--	2.7
OXYGENATES:										
Methanol	%(v/v)	12	0	0.5	0	0			--	3
Ethanol	%(v/v)	12	0	0.5	0	0			--	5
Iso-propyl alcohol	%(v/v)	12	0	0.5	0	0			--	10
Tetro-butyl alcohol	%(v/v)	12	0	0.5	0	0			--	7
Iso-butyl alcohol	%(v/v)	12	0	0.5	0	0			--	10
Ethers with 5 or more C atoms per molecule	%(v/v)	768	0	8.3	0.9	1.3			--	15
Other oxygenate	%(v/v)	12	0	0.5	0.4	0			--	10
SULPHUR CONTENT	mg/kg	2210	5	150	47.2	12.2			--	150
LEAD CONTENT	g/l	1362	0	0.004	0.001	0.0007			--	0.005

Notes:

Market Fuels used in vehicles with spark ingnition engines (Petrol)

Country: UK

Year: 2001

FuelID: Unleaded petrol min. RON=95 (<50 ppm sulphur)

National Fuel Grade Premium Unleaded

PARAMETER	Unit	Number of Samples	Min.	Max.	Mean	Standard deviation	National Specification Min.	National Specification Max.	EC Limit values Min.	EC Limit values Max.
RESEARCH OCTANE NO.	--	2210	95	97.8	95.3	0.5			95	--
MOTOR OCTANE NO.	--	2210	85	87.7	85.4	0.4			85	--
VAPOUR PRESSURE, DVP	kPa	404	52.5	70	68.8	2.6			--	70
Summer period	kPa	404	52.5	70	68.8	2.6			--	70
Winter period	kPa								--	--
DISTILLATTION:										
evaporated at 100	%(v/v)	2071	46	71	56.8	4			46.0	--
evaporated at 150	%(v/v)	1574	81	98.6	90.3	2.2			75.0	--
HYDROCARBON ANALYSIS:										
olefins	%(v/v)	1601	0.6	18	9.7	2.2			--	18.0
aromatic	%(v/v)	2124	15.8	40.2	29	2.5			--	42.0
benzene	%(v/v)	2188	0.1	1	0.7	0.15			--	1.0
OXYGEN CONTENT	%(m/m)	765	0	1.6	0.2	0.2			--	2.7
OXYGENATES:										
Methanol	%(v/v)	12	0	0.5	0	0			--	3
Ethanol	%(v/v)	12	0	0.5	0	0			--	5
Iso-propyl alcohol	%(v/v)	12	0	0.5	0	0			--	10
Tetro-butyl alcohol	%(v/v)	12	0	0.5	0	0			--	7
Iso-butyl alcohol	%(v/v)	12	0	0.5	0	0			--	10
Ethers with 5 or more C atoms per molecule	%(v/v)	768	0	8.3	0.9	1.3			--	15
Other oxygenate	%(v/v)	12	0	0.5	0.4	0			--	10
SULPHUR CONTENT	mg/kg	2210	5	150	47.2	12.2			--	150
LEAD CONTENT	g/l	1362	0	0.004	0.001	0.0007			--	0.005

Notes:

Market Fuels used in vehicles with spark ingnition engines (Petrol)

Country: UK

Year: 2001

FuelID: Unleaded petrol 95 =< RON < 98

National Fuel Grade Super Unleaded and Lead repla

PARAMETER	Unit	Number of Samples	Min.	Max.	Mean	Standard deviation	National Specification Min.	National Specification Max.	EC Limit values Min.	EC Limit values Max.
RESEARCH OCTANE NO.	--	320	97	98.8	97.3	0.3	97		95	--
MOTOR OCTANE NO.	--	320	86	88	86.5	0.4	86		85	--
VAPOUR PRESSURE, DVP	kPa	69	56	70	67.9	2.3			--	70
Summer period	kPa	69	56	70	67.9	2.3			--	70
Winter period	kPa								--	--
DISTILLATTION:										
evaporated at 100	%(v/v)	316	46	67.5	52.7	3.3			46.0	--
evaporated at 150	%(v/v)	259	75	98	89.5	2.7			75.0	--
HYDROCARBON ANALYSIS:										
olefins	%(v/v)	244	0.9	18	10.6	2.9			--	18.0
aromatic	%(v/v)	305	20.2	41.9	31.5	2.9			--	42.0
benzene	%(v/v)	317	0.3	1	0.8	0.14			--	1.0
OXYGEN CONTENT	%(m/m)	161	0	1.8	0.3	0.3			--	2.7
OXYGENATES:										
Methanol	%(v/v)			0					--	3
Ethanol	%(v/v)			0					--	5
Iso-propyl alcohol	%(v/v)			0					--	10
Tetro-butyl alcohol	%(v/v)			0					--	7
Iso-butyl alcohol	%(v/v)			0					--	10
Ethers with 5 or more C atoms per molecule	%(v/v)	163	0	10.2	1.8	2.2			--	15
Other oxygenate	%(v/v)			0					--	10
SULPHUR CONTENT	mg/kg	317	3	150	77.1	25.4			--	150
LEAD CONTENT	g/l	217	0	0.003	0.001	0.0008			--	0.005

Notes:

Market fuels used in vehicles with compression ignition engines (Diesel)

Country: Austria

Year: 2001

FuelID: Diesel fuel

National Fuel Grade: Diesel

PARAMETER	Unit	Number of Samples	Min.	Max.	Mean	Standard deviation	National Specifications Min.	National Specifications Max.	EC Limit values Min.	EC Limit values Max.
CETANE NUMBER	--	120	50.9	54.8	52.4	0.69	51		51	--
DENSITY AT 15 C	kg/m3	120	824	843	835	4		845	--	845
DISTILLATION-95 C POINT	C	120	311	366	355	9.9		360	--	360
PAHs	%(m/m)	120	2.6	7.6	4.3	0.78		11	--	11
SULPHUR CONTENT	mg/kg	120	30	350	277	63		350	--	350

Notes:

Market fuels used in vehicles with compression ignition engines (Diesel)

Country: Belgium

Year: 2001

FuelID: Diesel fuel

National Fuel Grade: Diesel

PARAMETER	Unit	Number of Samples	Min.	Max.	Mean	Standard deviation	National Specifications Min.	National Specifications Max.	EC Limit values Min.	EC Limit values Max.
CETANE NUMBER	--	104	41.1	63.4	51.47	0.046	46		51	--
DENSITY AT 15 C	kg/m3	5893	820	850	837.9	0.065	820	845	--	845
DISTILLATION-95 C POINT	C	106	312.9	405	348.04	0.221		360	--	360
PAHs	%(m/m)								--	11
SULPHUR CONTENT	mg/kg	5907	100	500	268.6	1.167		350	--	350

Notes:

Market fuels used in vehicles with compression ignition engines (Diesel)

Country: Denmark

Year: 2001

FuelID: Diesel fuel (<50 ppm sulphur)

National Fuel Grade: Diesel

PARAMETER	Unit	Number of Samples	Min.	Max.	Mean	Standard deviation	National Specifications Min.	National Specifications Max.	EC Limit values Min.	EC Limit values Max.
CETANE NUMBER	--	20	51	54.5	51.9	0.8			51	--
DENSITY AT 15 C	kg/m3	20	825.8	845	842.6	4.4			--	845
DISTILLATION-95 C POINT	C	20	336.1	359.5	353.1	5.7			--	360
PAHs	%(m/m)	20	1.6	6.3	3.6	1.4			--	11
SULPHUR CONTENT	mg/kg	20	28	141	51	23			--	350

Notes:

Market fuels used in vehicles with compression ignition engines (Diesel)

Country: Finland

Year: 2001

FuelID: Diesel fuel

National Fuel Grade: Diesel

PARAMETER	Unit	Number of Samples	Min.	Max.	Mean	Standard deviation	National Specifications Min.	National Specifications Max.	EC Limit values Min.	EC Limit values Max.
CETANE NUMBER	--	88	51	55	52.4	1			51	--
DENSITY AT 15 C	kg/m3	98	822	843	835.3	5.6			--	845
DISTILLATION-95 C POINT	C	88	304.2	360.8	330.7	16.2			--	360
PAHs	%(m/m)	98	0.3	3.4	1.2	0.5			--	11
SULPHUR CONTENT	mg/kg	98	3	757	33.6	74.3			--	350

Notes:

Market fuels used in vehicles with compression ignition engines (Diesel)

Country: Finland

Year: 2001

FuelID: Diesel fuel (<50 ppm sulphur)

National Fuel Grade: Diesel

PARAMETER	Unit	Number of Samples	Min.	Max.	Mean	Standard deviation	National Specifications Min.	National Specifications Max.	EC Limit values Min.	EC Limit values Max.
CETANE NUMBER	--	88	51	55	52.4	1			51	--
DENSITY AT 15 C	kg/m3	98	822	843	835.3	5.6			--	845
DISTILLATION-95 C POINT	C	88	304.2	360.8	330.7	16.2			--	360
PAHs	%(m/m)	98	0.3	3.4	1.2	0.5			--	11
SULPHUR CONTENT	mg/kg	98	3	757	33.6	74.3			--	350

Notes:

Market fuels used in vehicles with compression ignition engines (Diesel)

Country: France

Year: 2001

FuelID: Diesel fuel

National Fuel Grade: Diesel

PARAMETER	Unit	Number of Samples	Min.	Max.	Mean	Standard deviation	National Specifications Min.	National Specifications Max.	EC Limit values Min.	EC Limit values Max.
CETANE NUMBER	--	79	46	61.2	50.1	2.2			51	--
DENSITY AT 15 C	kg/m3	79	816.9	845.9	835.5	5.9	820		--	845
DISTILLATION-95 C POINT	C								--	360
PAHs	%(m/m)								--	11
SULPHUR CONTENT	mg/kg	79	50	370	295	44			--	350

Notes:

Market fuels used in vehicles with compression ignition engines (Diesel)

Country: Germany

Year: 2001

FuelID: Diesel fuel

National Fuel Grade: Diesel

PARAMETER	Unit	Number of Samples	Min.	Max.	Mean	Standard deviation	National Specifications Min.	National Specifications Max.	EC Limit values Min.	EC Limit values Max.
CETANE NUMBER	--	164	50.9	60	53.9				51	--
DENSITY AT 15 C	kg/m3	186	827	844.7	836.6		820		--	845
DISTILLATION-95 C POINT	C	133	321	360	345.9				--	360
PAHs	%(m/m)	145	0	8.1	4.6				--	11
SULPHUR CONTENT	mg/kg	183	20	400	285		55		--	350

Notes: Sulphur Max see notes.

Market fuels used in vehicles with compression ignition engines (Diesel)

Country: Germany

Year: 2001

FuelID: Diesel fuel (<50 ppm sulphur)

National Fuel Grade: Low Sulphur Diesel

PARAMETER	Unit	Number of Samples	Min.	Max.	Mean	Standard deviation	National Specifications Min.	National Specifications Max.	EC Limit values Min.	EC Limit values Max.
CETANE NUMBER	--	17	52.2	52.8	53.2				51	--
DENSITY AT 15 C	kg/m3	55	828	841	834.4		820		--	845
DISTILLATION-95 C POINT	C	17	343.2	350.3	346.4				--	360
PAHs	%(m/m)	2	4	4.2	3.8			50	--	11
SULPHUR CONTENT	mg/kg	59	16	154	35		55		--	350

Notes:

Market fuels used in vehicles with compression ignition engines (Diesel)

Country: Germany

Year: 2001

FuelID: Diesel fuel (<10 ppm sulphur)

National Fuel Grade: Sulphur Free Diesel

PARAMETER	Unit	Number of Samples	Min.	Max.	Mean	Standard deviation	National Specifications Min.	National Specifications Max.	EC Limit values Min.	EC Limit values Max.
CETANE NUMBER	--	2	53.4	53.7	53.6				51	--
DENSITY AT 15 C	kg/m3	2	825.4	825.7	825.6		820		--	845
DISTILLATION-95 C POINT	C	2	338.1	338.3	338.2				--	360
PAHs	%(m/m)							10	--	11
SULPHUR CONTENT	mg/kg	2	13	13	13		55		--	350

Notes:

Market fuels used in vehicles with compression ignition engines (Diesel)

Country: Greece

Year: 2001

FuelID: Diesel fuel

National Fuel Grade: Diesel

PARAMETER	Unit	Number of Samples	Min.	Max.	Mean	Standard deviation	National Specifications Min.	National Specifications Max.	EC Limit values Min.	EC Limit values Max.
CETANE NUMBER	--	53	50.4	61.2	55.1	2.64	51		51	--
DENSITY AT 15 C	kg/m3	53	823	845	837	6.58			--	845
DISTILLATION-95 C POINT	C	53	346	364	357	3.77			--	360
PAHs	%(m/m)	53	9	10	9.2	0.42			--	11
SULPHUR CONTENT	mg/kg	53	140	350	281	47.54			--	350

Notes:

Market fuels used in vehicles with compression ignition engines (Diesel)

Country: Ireland

Year: 2001

FuelID: Diesel fuel

National Fuel Grade: Diesel

PARAMETER	Unit	Number of Samples	Min.	Max.	Mean	Standard deviation	National Specifications Min.	National Specifications Max.	EC Limit values Min.	EC Limit values Max.
CETANE NUMBER	--	9	49.4	54.8	53	1.6			51	--
DENSITY AT 15 C	kg/m3	35	826	844	839	4			--	845
DISTILLATION-95 C POINT	C	35	317.8	360.6	349.2	9.5			--	360
PAHs	%(m/m)	35	2.4	5.2	3.8	0.7			--	11
SULPHUR CONTENT	mg/kg	38	21	349	231	83			--	350

Notes:

Market fuels used in vehicles with compression ignition engines (Diesel)

Country: Italy

Year: 2001

FuelID: Diesel fuel

National Fuel Grade: Diesel

PARAMETER	Unit	Number of Samples	Min.	Max.	Mean	Standard deviation	National Specifications Min.	National Specifications Max.	EC Limit values Min.	EC Limit values Max.
CETANE NUMBER	--	179	49	58.7	52.5	1.75	51		51	--
DENSITY AT 15 C	kg/m3	240	820.9	845	835.4	4.9		845	--	845
DISTILLATION-95 C POINT	C	240	340	367	356.3	4.73		360	--	360
PAHs	%(m/m)	106	2.2	10.8	5.4	1.27		11	--	11
SULPHUR CONTENT	mg/kg	239	105	376	273.1	50.2		350	--	350

Notes:

Market fuels used in vehicles with compression ignition engines (Diesel)

Country: Luxembourg

Year: 2001

FuelID: Diesel fuel

National Fuel Grade: Diesel

PARAMETER	Unit	Number of Samples	Min.	Max.	Mean	Standard deviation	National Specifications Min.	National Specifications Max.	EC Limit values Min.	EC Limit values Max.
CETANE NUMBER	--	4	51.01	54.5	51.9				51	--
DENSITY AT 15 C	kg/m3	4	838.2	844.5	841				--	845
DISTILLATION-95 C POINT	C	4	349.5	360.5	356				--	360
PAHs	%(m/m)								--	11
SULPHUR CONTENT	mg/kg	4	200	290	252				--	350

Notes:

Market fuels used in vehicles with compression ignition engines (Diesel)

Country: Netherlands

Year: 2001

FuelID: Diesel fuel

National Fuel Grade: Diesel

PARAMETER	Unit	Number of Samples	Min.	Max.	Mean	Standard deviation	National Specifications Min.	National Specifications Max.	EC Limit values Min.	EC Limit values Max.
CETANE NUMBER	--	19	51	55.5	52.8				51	--
DENSITY AT 15 C	kg/m3	19	829.5	838.4	834.2				--	845
DISTILLATION-95 C POINT	C	19	349.9	358	353.7				--	360
PAHs	%(m/m)	19	2.6	4.9	3.6				--	11
SULPHUR CONTENT	mg/kg	19	14	81	42.3				--	350

Notes:

Market fuels used in vehicles with compression ignition engines (Diesel)

Country: Netherlands

Year: 2001

FuelID: Diesel fuel (<50 ppm sulphur)

National Fuel Grade: Diesel

PARAMETER	Unit	Number of Samples	Min.	Max.	Mean	Standard deviation	National Specifications Min.	National Specifications Max.	EC Limit values Min.	EC Limit values Max.
CETANE NUMBER	--	19	51	55.5	52.8				51	--
DENSITY AT 15 C	kg/m3	19	829.5	838.4	834.2				--	845
DISTILLATION-95 C POINT	C	19	349.9	358	353.7				--	360
PAHs	%(m/m)	19	2.6	4.9	3.6				--	11
SULPHUR CONTENT	mg/kg	19	14	81	42.3				--	350

Notes:

Market fuels used in vehicles with compression ignition engines (Diesel)

Country: Portugal

Year: 2001

FuelID: Diesel fuel

National Fuel Grade: Diesel

PARAMETER	Unit	Number of Samples	Min.	Max.	Mean	Standard deviation	National Specifications Min.	National Specifications Max.	EC Limit values Min.	EC Limit values Max.
CETANE NUMBER	--	20	51	56.4	51.8	1.23	51		51	--
DENSITY AT 15 C	kg/m3	20	833	845	839.8	4.55	820	845	--	845
DISTILLATION-95 C POINT	C	20	348.6	360	357.2	3.54			--	360
PAHs	%(m/m)	15	3.6	5.8	4.7	0.6		11	--	11
SULPHUR CONTENT	mg/kg	93	178	350	271.6	42.35		350	--	350

Notes:

Market fuels used in vehicles with compression ignition engines (Diesel)

Country: Spain

Year: 2001

FuelID: Diesel fuel

National Fuel Grade: Diesel

PARAMETER	Unit	Number of Samples	Min.	Max.	Mean	Standard deviation	National Specifications Min.	National Specifications Max.	EC Limit values Min.	EC Limit values Max.
CETANE NUMBER	--	222	51	58.8	52.9	1.98	51		51	--
DENSITY AT 15 C	kg/m3	222	826	844.8	839.9	3.39	820	845	--	845
DISTILLATION-95 C POINT	C	222	312.4	360	355	5.54		360	--	360
PAHs	%(m/m)	222	2.9	7.2	3	1.05		11	--	11
SULPHUR CONTENT	mg/kg	222	10	350	278	68		350	--	350

Notes:

Market fuels used in vehicles with compression ignition engines (Diesel)

Country: Sweden

Year: 2001

FuelID: Diesel fuel (<10 ppm sulphur)

National Fuel Grade: Diesel

PARAMETER	Unit	Number of Samples	Min.	Max.	Mean	Standard deviation	National Specifications Min.	National Specifications Max.	EC Limit values Min.	EC Limit values Max.
CETANE NUMBER	--	638	50	58.1	52.9		50		51	--
DENSITY AT 15 C	kg/m3	638	808.3	819.8	813.9		800	820	--	845
DISTILLATION-95 C POINT	C	638	247.7	285	280.6			285	--	360
PAHs	%(m/m)	638	0.02	0.02	0.02			0.02	--	11
SULPHUR CONTENT	mg/kg	638	0	10	1.2			10	--	350

Notes:

Market fuels used in vehicles with compression ignition engines (Diesel)

Country: UK

Year: 2001

FuelID: Diesel fuel (<50 ppm sulphur)

National Fuel Grade: Diesel

PARAMETER	Unit	Number of Samples	Min.	Max.	Mean	Standard deviation	National Specifications Min.	National Specifications Max.	EC Limit values Min.	EC Limit values Max.
CETANE NUMBER	--	935	51	58.2	53.4	1.3			51	--
DENSITY AT 15 C	kg/m3	1773	820.9	835	832	2.3			--	845
DISTILLATION-95 C POINT	C	1398	299	345	335.7	5.3			--	360
PAHs	%(m/m)	628	0.1	10.5	2.9	1.4			--	11
SULPHUR CONTENT	mg/kg	1773	1	68	40	6.4			--	350

Notes:

Appendix 4: Proposed Excel Reporting Template

CONTENTS

Contacts & Fuel Quality Monitoring System

Details of those compiling the Fuel Quality Monitoring Report

The authorities responsible for compiling the fuel quality monitoring report are requested to complete the table below

Reporting Year	
Country	
Date report completed	
Institute responsible for Report	
Person responsible for Report	
Telephone number:	
Email	

Description of Fuel Quality Monitoring System

Member States should provide a description on the operation of their national fuel quality monitoring systems.

Description of FQM system	

OPTIONAL INFORMATION

Please supply the following information below (as far as possible), or alternatively contained in a word document containing similar information.

Responsible organisations (for sampling, analysis & reporting)	
Types of Sampling Locations (e.g. refinery, terminal, retail site)	
Time/frequency/occasion of sampling	
Number of samples taken at fuel dispensing sites (i.e. retail or commercial)	
Number of refineries serving the market	
Number of sources of imported fuels --Petrol --Diesel	
Method of collection of sales data	
Other relevant details:	

Total Sales & Availability of Sulphur-Free Fuels

TOTAL SALES OF PETROL AND DIESEL **Year:**

Member states are requested to complete the following table detailing the quantities of each grade of petrol and diesel marketed in their territory
*NB: Please do not report national fuel grade sales under more than one category.

OPTIONAL INFORMATION SHOWN IN RED TEXT

Fuel Grade	National sales total		National Fuel Grades included in totals*	No. Samples Taken	
	Litres	Tonnes		dispensing sites	Total
Regular unleaded petrol (minimum RON = 91)[1]					
Unleaded petrol (minimum RON = 95)[1]					
Unleaded petrol (minimum RON = 95 & < 50 ppm Sulphur)[2]					
Sulphur free unleaded petrol (< 10 ppm Sulphur)[3]					
Unleaded petrol (minimum 95 =< RON < 98)					
Unleaded petrol (minimum RON >= 98)					
Regular unleaded petrol (minimum RON = 91 & < 50 ppm Sulphur)					
Regular unleaded petrol (minimum RON = 91 & < 10 ppm Sulphur)					
Unleaded petrol (minimum RON = 95 & < 10 ppm Sulphur)3					
Unleaded petrol (minimum 95 =< RON < 98 & < 50 ppm Sulphur)					
Unleaded petrol (minimum 95 =< RON < 98 & < 10 ppm Sulphur)					
Unleaded petrol (minimum RON >= 98 & < 50 ppm Sulphur)					
Unleaded petrol (minimum RON >= 98 & < 10 ppm Sulphur)					
Diesel fuel[4]					
Diesel fuel (< 50 ppm sulphur)[5]					
Diesel fuel (< 10 ppm sulphur)[6]					

1 as specified in Annex I of Directive 98/70/EC
2 as specified in Annex III of Directive 98/70/EC
3 as specified in Annex III of Directive 98/70/EC except the sulphur content which must be less than 10ppm
4 as specified in Annex II of Directive 98/70/EC
5 as specified in Annex IV of Directive 98/70/EC
6 as specified in Annex IV of Directive 98/70/EC except the sulphur content which must be less than 10ppm

Comments (completeness of data, particular issues, etc.)	

Geographical Availability of Sulphur-Free Fuels

Please provide description of the geographical extent to which sulphur-free petrol and diesel are marketed within the territory of a Member State.
Ideally this should include details such as, the % of fuel stations with the fuels available, regional spread, or availability in cities vs. rural areas:

Petrol:

Diesel:

Definition of Summer Period for Petrol Volatility

Official Summer Period to be applied to monitoring data * Normal = 1st May to 30th September; Arctic = 1st June to 31st Augus	
Details of National Periods Applied:	

Appendix I: Market Fuels used in Vehicles with Spark Ignition Engines (Petrol)

Country		
Reporting Year		
Parent fuel grade		
National fuel grade		
Summer Period*		1st May to 30th September (normal)

* N = 1st May to 30th September (normal) ; A = 1st June to 31st August (arctic).

Reporting results

Parameter	Unit	Analytical and statistical results					Limiting Value (1)			
							National Specification, if any		According to 98/70 EC	
		N° Samples	Minimum	Maximum	Mean	Standard Deviation	Minimum	Maximum	Minimum	Maximum
Research Octane Number	--								95.0	
Motor Octane Number	--								85.0	
Vapour Pressure, DVPE	kPa									
--summer period only										60.0
Distillation										
-- evaporated at 100 °C	% (v/v)								46.0	
-- evaporated at 150 °C	% (v/v)								75.0	
Hydrocarbon analysis										
-- Olefins	% (v/v)									18.0
-- Aromatics	% (v/v)									42.0
-- Benzene	% (v/v)									1.0
Oxygen content	% (m/m)									2.7
Oxygenates										
-- Methanol	% (v/v)									3
-- Ethanol	% (v/v)									5
-- Iso-propyl alcohol	% (v/v)									10
-- Tert-butyl alcohol	% (v/v)									7
-- Iso-butyl alcohol	% (v/v)									10
-- Ethers with 5 or more carbon atoms per molecule	% (v/v)									15
-- other oxygenates	% (v/v)									10
Sulphur content	mg/kg									150
Lead content	g/l									

(1) The limiting values are "true values" and were established according to the procedures for limit setting in EN ISO 4529:1995. The results of individual measurements shall be interpreted following the criteria described in EN ISO 4529:1995

Other notes (optional):

Sampling frequency

Number of samples in month	January	February	March	April	May	June	Total
	July	August	September	October	November	December	
							0

OPTIONAL INFORMATION

Test Methods and Analysis

Parameter	Unit	Test specified in 98/70/EC or EN228						Notes on exceedences		
		Method	Date	Reproducability, R	Tolerance limits			No. samples	Values	Details/action taken
					Minimum	Maximum	Exceeded?			
Research Octane Number	--	EN 25164	1993	0.7	94.6		Yes			
Motor Octane Number	--	EN 25163	1993	0.9	84.5		Yes			
Vapour Pressure, DVPE										
--summer period	kPa	EN 12	1993	4.9		62.9				
Distillation										
--evaporated at 100 °C	% (v/v)	EN-ISO 3405	1988		46.0		Yes			
-- evaporated at 150 °C	% (v/v)				75.0		Yes			
Hydrocarbon analysis										
-- Olefins	% (v/v)	ASTM D1319	1995	6.8		22.0				
-- Aromatics	% (v/v)	ASTM D1319	1995	3.5		44.1				
-- Benzene	% (v/v)	pr. EN 12177	1995	0.1		1.1				
Oxygen content	% (m/m)	EN 1601	1996	0.3		2.9				
Oxygenates										
-- Methanol	% (v/v)	EN 1601	1996	0.4		3.2				
-- Ethanol	% (v/v)	EN 1601	1996	0.3		5.2				
-- Iso-propyl alcohol	% (v/v)	EN 1601	1996	0.9		10.5				
-- Tert-butyl alcohol	% (v/v)	EN 1601	1996	0.6		7.4				
-- Iso-butyl alcohol	% (v/v)	EN 1601	1996	0.8		10.5				
-- Ethers with 5 or more carbon atoms per molecule	% (v/v)	EN 1601	1996	1		15.6				
-- other oxygenates	% (v/v)	EN 1601	1996	0.8		10.5				
Sulphur content	mg/kg	pr. EN-ISO/DIS 14596	1996	0.8		150.5				
Lead content	g/l	EN 237	1996	2		1.2				

Appendix I: Market Fuels used in Vehicles with Spark Ignition Engines (Petrol)

Country		
Reporting Year		
Parent fuel grade		
National fuel grade		
Summer Period*		1st May to 30th September (normal)

* N = 1st May to 30th September (normal) ; A = 1st June to 31st August (arctic).

Reporting results

Parameter	Unit	Analytical and statistical results					Limiting Value (1)			
							National Specification, if any		According to 98/70 EC	
		N° Samples	Minimum	Maximum	Mean	Standard Deviation	Minimum	Maximum	Minimum	Maximum
Research Octane Number	--								95.0	
Motor Octane Number	--								85.0	
Vapour Pressure, DVPE	kPa									
--summer period only										60.0
Distillation										
-- evaporated at 100 °C	% (v/v)								46.0	
-- evaporated at 150 °C	% (v/v)								75.0	
Hydrocarbon analysis										
-- Olefins	% (v/v)									18.0
-- Aromatics	% (v/v)									42.0
-- Benzene	% (v/v)									1.0
Oxygen content	% (m/m)									2.7
Oxygenates										
-- Methanol	% (v/v)									3
-- Ethanol	% (v/v)									5
-- Iso-propyl alcohol	% (v/v)									10
-- Tert-butyl alcohol	% (v/v)									7
-- Iso-butyl alcohol	% (v/v)									10
-- Ethers with 5 or more carbon atoms per molecule	% (v/v)									15
-- other oxygenates	% (v/v)									10
Sulphur content	mg/kg									150
Lead content	g/l									

(1) The limiting values are "true values" and were established according to the procedures for limit setting in EN ISO 4529:1995. The results of individual measurements shall be interpreted following the criteria described in EN ISO 4529:1995

Other notes (optional):

Sampling frequency

Number of samples in month	January	February	March	April	May	June	Total
	July	August	September	October	November	December	
							0

OPTIONAL INFORMATION

Test Methods and Analysis

Parameter	Unit	Test specified in 98/70/EC or EN228						Notes on exceedences		
		Method	Date	Reproducability, R	Tolerance limits			No. samples	Values	Details/action taken
					Minimum	Maximum	Exceeded?			
Research Octane Number	--	EN 25164	1993	0.7	94.6		Yes			
Motor Octane Number	--	EN 25163	1993	0.9	84.5		Yes			
Vapour Pressure, DVPE										
--summer period	kPa	EN 12	1993	4.9		62.9				
Distillation										
--evaporated at 100 °C	% (v/v)	EN-ISO 3405	1988		46.0		Yes			
-- evaporated at 150 °C	% (v/v)				75.0		Yes			
Hydrocarbon analysis										
-- Olefins	% (v/v)	ASTM D1319	1995	6.8		22.0				
-- Aromatics	% (v/v)	ASTM D1319	1995	3.5		44.1				
-- Benzene	% (v/v)	pr. EN 12177	1995	0.1		1.1				
Oxygen content	% (m/m)	EN 1601	1996	0.3		2.9				
Oxygenates										
-- Methanol	% (v/v)	EN 1601	1996	0.4		3.2				
-- Ethanol	% (v/v)	EN 1601	1996	0.3		5.2				
-- Iso-propyl alcohol	% (v/v)	EN 1601	1996	0.9		10.5				
-- Tert-butyl alcohol	% (v/v)	EN 1601	1996	0.6		7.4				
-- Iso-butyl alcohol	% (v/v)	EN 1601	1996	0.8		10.5				
-- Ethers with 5 or more carbon atoms per molecule	% (v/v)	EN 1601	1996	1		15.6				
-- other oxygenates	% (v/v)	EN 1601	1996	0.8		10.5				
Sulphur content	mg/kg	pr. EN-ISO/DIS 14596	1996	0.8		150.5				
Lead content	g/l	EN 237	1996	2		1.2				

Appendix I: Market Fuels used in Vehicles with Spark Ignition Engines (Petrol)

Country		
Reporting Year		
Parent fuel grade		
National fuel grade		
Summer Period*		1st May to 30th September (normal)

* N = 1st May to 30th September (normal) ; A = 1st June to 31st August (arctic).

Reporting results

Parameter	Unit	Analytical and statistical results					Limiting Value (1)			
							National Specification, if any		According to 98/70 EC	
		N° Samples	Minimum	Maximum	Mean	Standard Deviation	Minimum	Maximum	Minimum	Maximum
Research Octane Number	--								95.0	
Motor Octane Number	--								85.0	
Vapour Pressure, DVPE	kPa									
--summer period only										60.0
Distillation										
-- evaporated at 100 °C	% (v/v)								46.0	
-- evaporated at 150 °C	% (v/v)								75.0	
Hydrocarbon analysis										
-- Olefins	% (v/v)									18.0
-- Aromatics	% (v/v)									42.0
-- Benzene	% (v/v)									1.0
Oxygen content	% (m/m)									2.7
Oxygenates										
-- Methanol	% (v/v)									3
-- Ethanol	% (v/v)									5
-- Iso-propyl alcohol	% (v/v)									10
-- Tert-butyl alcohol	% (v/v)									7
-- Iso-butyl alcohol	% (v/v)									10
-- Ethers with 5 or more carbon atoms per molecule	% (v/v)									15
-- other oxygenates	% (v/v)									10
Sulphur content	mg/kg									150
Lead content	g/l									

(1) The limiting values are "true values" and were established according to the procedures for limit setting in EN ISO 4529:1995. The results of individual measurements shall be interpreted following the criteria described in EN ISO 4529:1995

Other notes (optional):

Sampling frequency

Number of samples in month	January	February	March	April	May	June	Total
	July	August	September	October	November	December	
							0

OPTIONAL INFORMATION

Test Methods and Analysis

Parameter	Unit	Test specified in 98/70/EC or EN228						Notes on exceedences		
		Method	Date	Reproducability, R	Tolerance limits			No. samples	Values	Details/action taken
					Minimum	Maximum	Exceeded?			
Research Octane Number	--	EN 25164	1993	0.7	94.6		Yes			
Motor Octane Number	--	EN 25163	1993	0.9	84.5		Yes			
Vapour Pressure, DVPE										
--summer period	kPa	EN 12	1993	4.9		62.9				
Distillation										
--evaporated at 100 °C	% (v/v)	EN-ISO 3405	1988		46.0		Yes			
-- evaporated at 150 °C	% (v/v)				75.0		Yes			
Hydrocarbon analysis										
-- Olefins	% (v/v)	ASTM D1319	1995	6.8		22.0				
-- Aromatics	% (v/v)	ASTM D1319	1995	3.5		44.1				
-- Benzene	% (v/v)	pr. EN 12177	1995	0.1		1.1				
Oxygen content	% (m/m)	EN 1601	1996	0.3		2.9				
Oxygenates										
-- Methanol	% (v/v)	EN 1601	1996	0.4		3.2				
-- Ethanol	% (v/v)	EN 1601	1996	0.3		5.2				
-- Iso-propyl alcohol	% (v/v)	EN 1601	1996	0.9		10.5				
-- Tert-butyl alcohol	% (v/v)	EN 1601	1996	0.6		7.4				
-- Iso-butyl alcohol	% (v/v)	EN 1601	1996	0.8		10.5				
-- Ethers with 5 or more carbon atoms per molecule	% (v/v)	EN 1601	1996	1		15.6				
-- other oxygenates	% (v/v)	EN 1601	1996	0.8		10.5				
Sulphur content	mg/kg	pr. EN-ISO/DIS 14596	1996	0.8		150.5				
Lead content	g/l	EN 237	1996	2		1.2				

Appendix II: Market Fuels used in the Compression Ignition Engines (Diesel)

Country	
Reporting year	
Parent fuel grade	
National fuel grade	

Reporting Results

Parameter	Unit	Analytical and statistical results					Limiting value (1)			
							National Specifications		According to 98/70/EC	
		N° Samples	Minimum	Maximum	Mean	Standard deviation	Minimum	Maximum	Minimum	Maximum
Cetane number	--								51.0	--
Density at 15 °C	kg/m³									845
Distillation -- 95-%-Point	°C									360
Polycyclic aromatic hydrocarbons	% (m/m)									11
Sulphur content	mg/kg									350

(1) The limiting values are "true values" and were established according to the procedures for limit setting in EN IASO 4259 :1995. The results of individual measurements shall be interpreted following the criteria described in EN ISO 4529 : 1995.

Other notes (optional):

Sampling Frequency

Number of samples in month	
January	
February	
March	
April	
May	
June	
July	
August	
September	
October	
November	
December	
Total	**0**

OPTIONAL INFORMATION

Test Methods and Analysis

Parameter	Unit	Test specified in 98/70/EC or EN228						Notes on exceedences		
		Method	Date	Reproducability, R	Tolerance limits			No. samples	Values	Details/action taken
					Minimum	Maximum	Exceeded?			
Cetane number	--	EN-ISO 5165	1992	4.3	48.4		Yes			
Density at 15 °C	kg/m^3	EN-ISO 3675	1995	1.2		845.7				
Distillation -- 95-%-Point	°C	EN-ISO 3405	1988			360.0				
Polycyclic aromatic hydrocarbons	% (m/m)	IP 391	1995	0.29		11.2				
Sulphur content	mg/kg	pr. EN-ISO/DIS 14596	1996	5		353.0				

Appendix II: Market Fuels used in the Compression Ignition Engines (Diesel)

Country	
Reporting year	
Parent fuel grade	
National fuel grade	

Reporting Results

Parameter	Unit	Analytical and statistical results					Limiting value (1)			
							National Specifications		According to 98/70/EC	
		N° Samples	Minimum	Maximum	Mean	Standard deviation	Minimum	Maximum	Minimum	Maximum
Cetane number	--								51.0	--
Density at 15 °C	kg/m³									845
Distillation -- 95-%-Point	°C									360
Polycyclic aromatic hydrocarbons	% (m/m)									11
Sulphur content	mg/kg									350

(1) The limiting values are "true values" and were established according to the procedures for limit setting in EN IASO 4259 :1995. The results of individual measurements shall be interpreted following the criteria described in EN ISO 4529 : 1995.

Other notes (optional):

Sampling Frequency

Number of samples in month	
January	
February	
March	
April	
May	
June	
July	
August	
September	
October	
November	
December	
Total	**0**

OPTIONAL INFORMATION

Test Methods and Analysis

Parameter	Unit	Test specified in 98/70/EC or EN228						Notes on exceedences		
		Method	Date	Reproducability, R	Tolerance limits			No. samples	Values	Details/action taken
					Minimum	Maximum	Exceeded?			
Cetane number	--	EN-ISO 5165	1992	4.3	48.4		Yes			
Density at 15 °C	kg/m^3	EN-ISO 3675	1995	1.2		845.7				
Distillation -- 95-%-Point	°C	EN-ISO 3405	1988			360.0				
Polycyclic aromatic hydrocarbons	% (m/m)	IP 391	1995	0.29		11.2				
Sulphur content	mg/kg	pr. EN-ISO/DIS 14596	1996	5		353.0				