RICARDO-AEA

EU Fuel Quality Monitoring – 2012 Summary Report

Final report to the European Commission DG Climate Action

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Executive Summary

Introduction

This report produced for DG Climate Action represents a consolidation of the twelfth year of Member States' submissions under Directive 98/70/EC[1], summarising the quality of petrol and diesel in the Community for the year 2012. Specifications for petrol and diesel sold in the European Community are included in the Directive. Three sets of fuel specifications are included, the first entered into force on 1 January 2000 and the second entered into force on 1 January 2005. A third specification for automotive road fuels came into force on 1 January 2009 and limits the sulphur content of all automotive road fuels in the EU to 10 ppm. Additional requirements were defined in the European Standard for fuel quality monitoring systems, EN 14274:2003, required from 2004 under Directive 2003/17/EC. 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 Directive also stipulates that Member States are required to report summaries of the quality of fuels sold in their territories. The original reporting format for this was laid out in Commission Decision 2002/159/EC of 18 February 2002[2]. The requirements of the Directive have changed with the introduction of new fuel specifications and reporting requirements. It is therefore anticipated that a new Commission Decision on the common reporting format for Fuel Quality Monitoring report will be released in line with these changes – although nothing had been released prior to finalisation of this Summary report. All Member States receive an annually updated reporting template in order to ensure inclusion of all pertinent details to enable European wide analysis and comparison of Fuel Quality Monitoring results. This template follows the reporting requirements outlined in Commission Decision 2002/159/EC and is annually reviewed and agreed with the Commission. The 2012 reporting template has been included as an appendix to this report (Reporting Template (2012)).

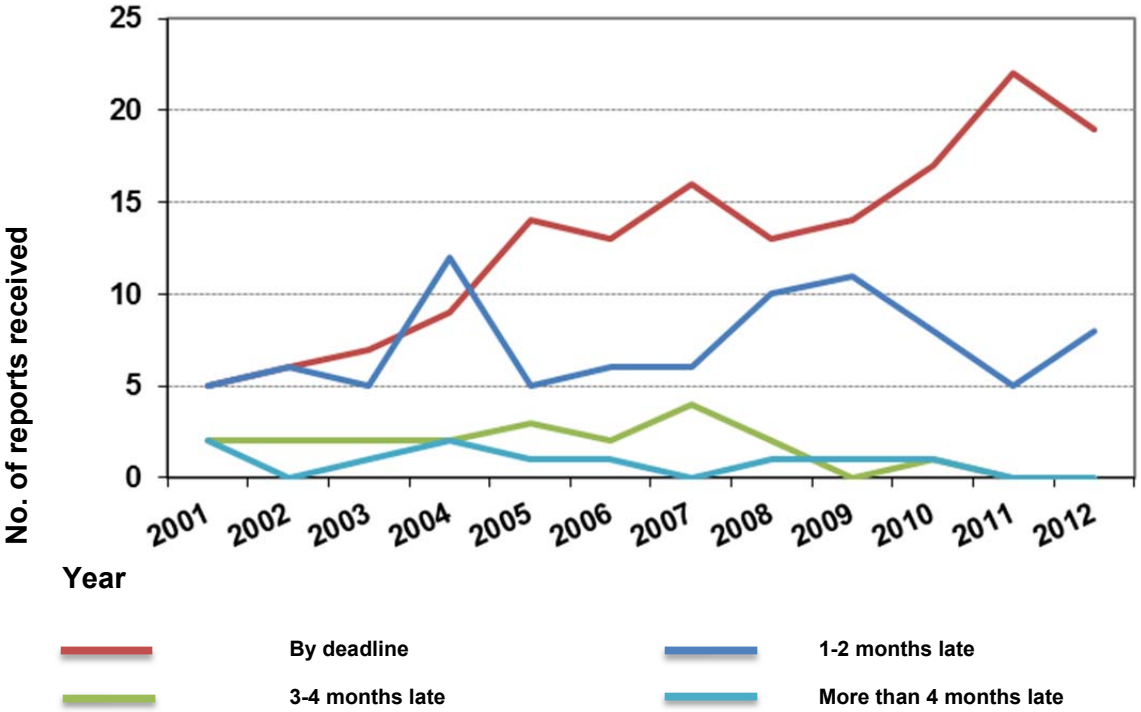
In 2012, all Member States have complied with the new fuel specifications. These specifications state that all automotive road fuels available on the market from 1st January 2009 contain less than 10ppm sulphur content. In addition, Member States have begun to report fuels with added ethanol from biofuels, which is a mandatory reporting requirement from 1st January 2011 under Directive amendment 2009/30/EC.

In 2012, all Member States submitted their reports in the Commission-approved template provided. Of the 27 annual FQMS reports, 19 were received by the reporting deadline, 30th June. 6 were received less than one month late, during July, with two reports (Germany and Spain) submitted less than two months late. Figure 1-1 presents reporting submissions (of reports received in the standard template) compared to the deadline from 2001. There is a clear improvement in the timeliness of submissions in 2012 compared with previous years; more timely submissions, and for the first time- no submissions over two months late. Late submissions can be due to delays in internal approvals within Member State departments but can also be due to submitting the report through incorrect channels.

Fuel sales in the EU in 2012 were heavily weighted toward diesel with 242,830 million litres of diesel fuel sales compared to 109,331 million litres of combined petrol grade fuel sales. Of the petrol fuel grades, very small amounts of RON 91 were still available on the market with sales of only 456 million litres (0.42%); RON 95 - 98 totalled 14,622 million litres (13.37%); RON 98 totalled 4,419 million litres (4.04%) whilst RON 95 represented the majority of petrol fuel sales with 89,833 million litres (82.17%). In diesel, the B7 grade represented the majority of sales with 219,769 million litres sold (90%). B5 diesel, B+ and diesel sold as total of 22,924 (2,720, 137 and 20,204 million litres respectively).

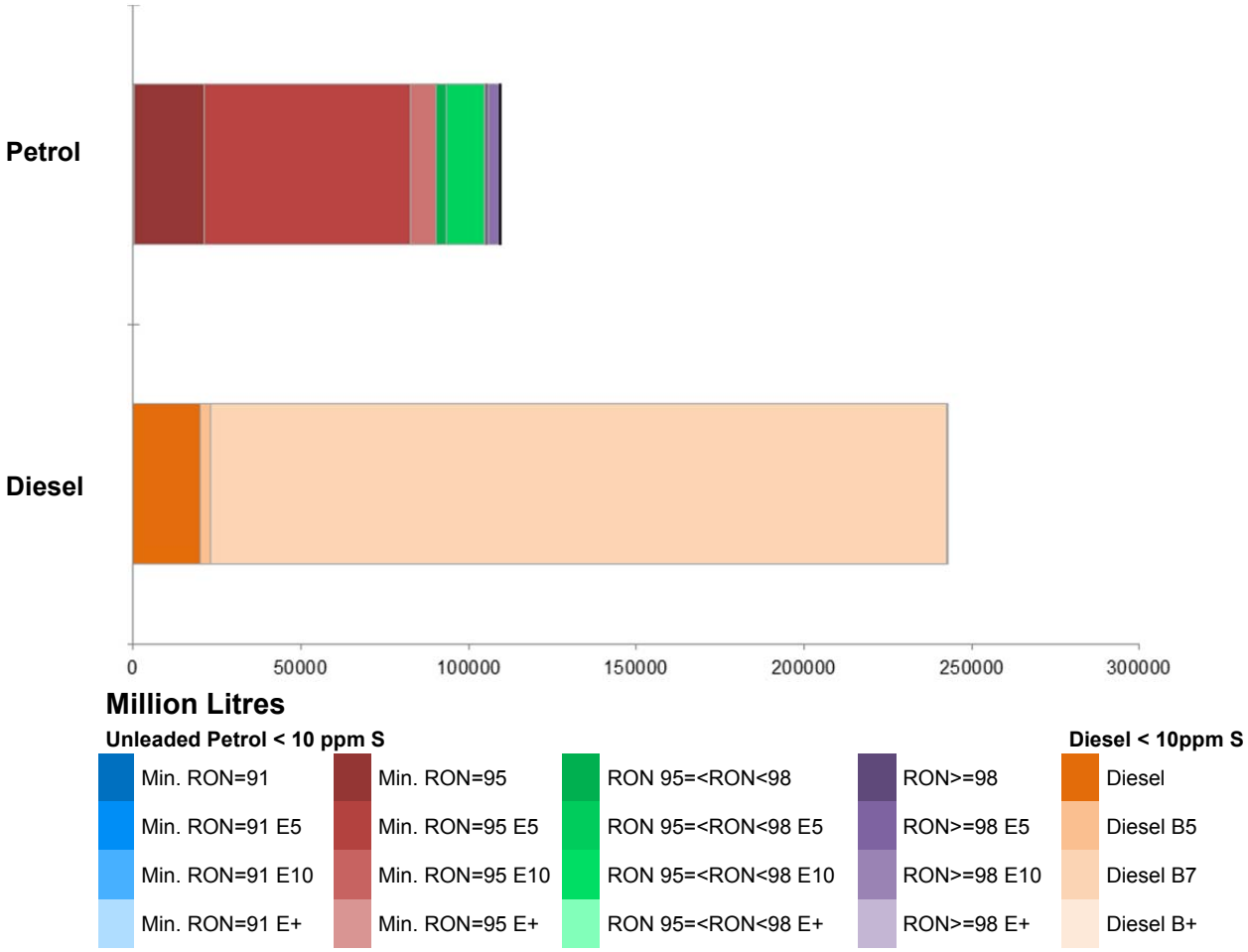
[1] O.J. L 350 of 28.12.1998, p. 58
[2] O.J. L 53 of 23.2.2002, p.30

Figure 1-1: Temporal trends in the punctuality of report submissions



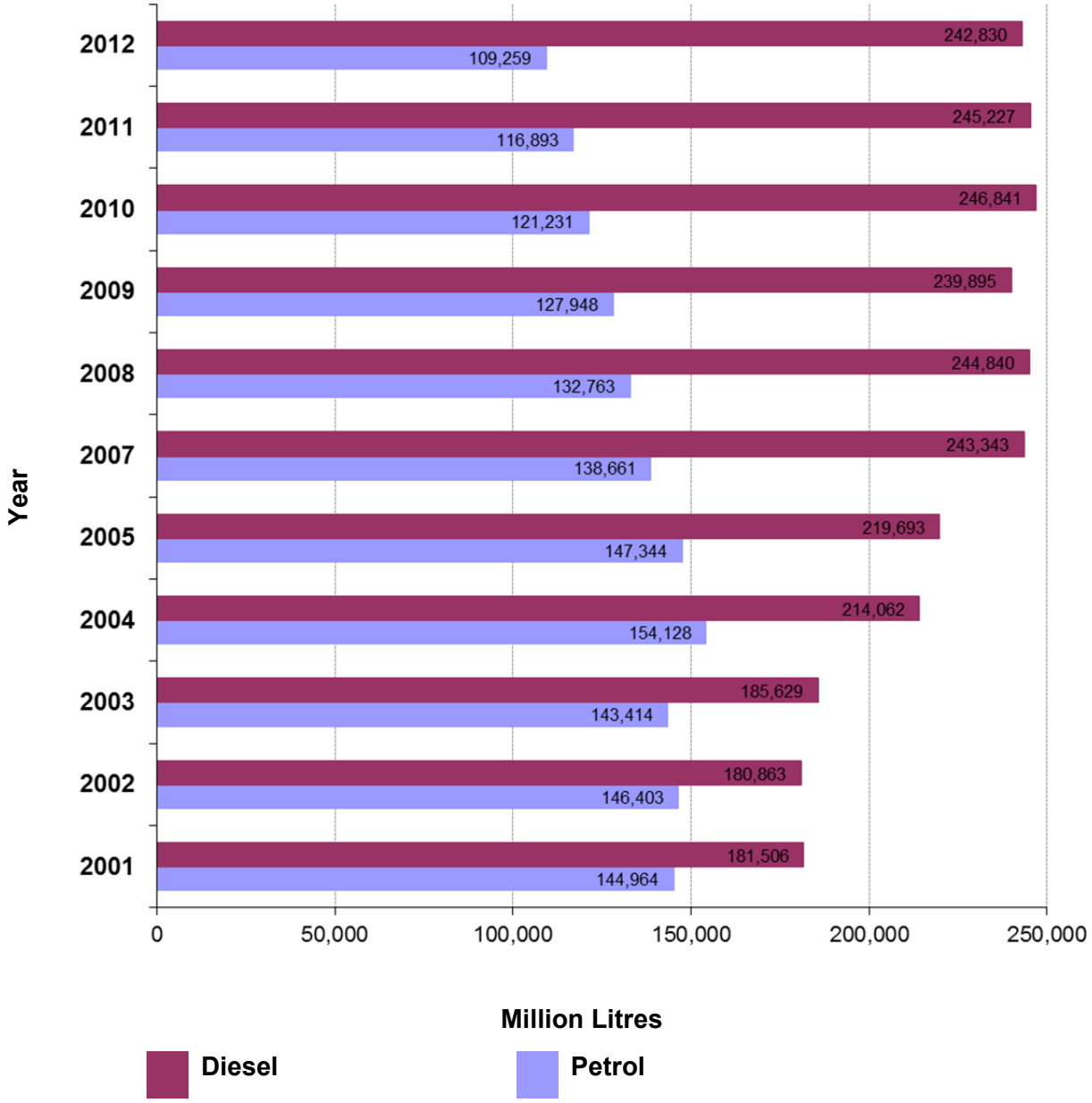
*** Excludes France in 2003 - 2005, as no submissions were provided. Excludes Luxembourg in 2007 to 2009 and Malta in 2006 and 2009 as no reports were provided. The EU expanded in 2004, 2007 from 15 to 27 Member States.**

Figure 1-2: EU fuel sales by fuel type



The overall EU-wide fuel sales in 2012 (see Figure 1-3) remained similar to sales in 2011, with a decrease in both petrol (reduction of 7,561 million litres) and diesel (reduction of 2,396 million litres) fuel sales. This resulted in a total decrease of 9,957 million litres of automotive road fuels sold from 2011 to 2012.

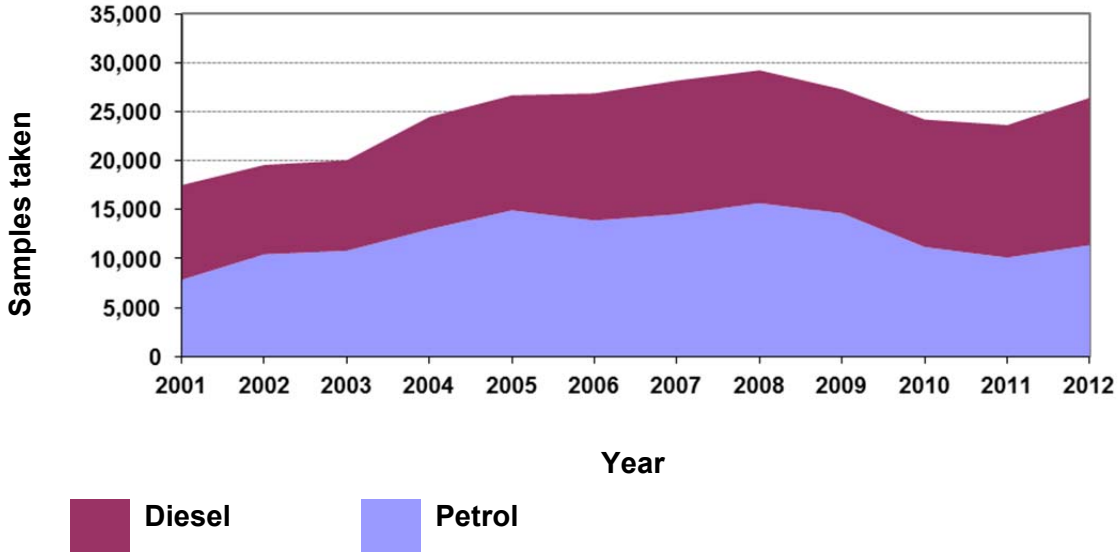
Figure 1-3: Temporal trends in EU fuel sales



*** Excludes France in 2003 - 2005, as no submissions were provided. Excludes Luxembourg in 2007 to 2009 and Malta in 2006 and 2009 as no reports were provided. In addition, the EU expanded in 2004, 2007 from 15 to 27 Member States.**

Individual Member State reports in 2012 demonstrated increased compliance with the minimum sampling requirements outlined in EN 14274, however national models still in some cases fall short of equivalence with EN 14274 standards. Figure 1-4 shows the total samples taken in the EU temporally from 2001 – 2012.

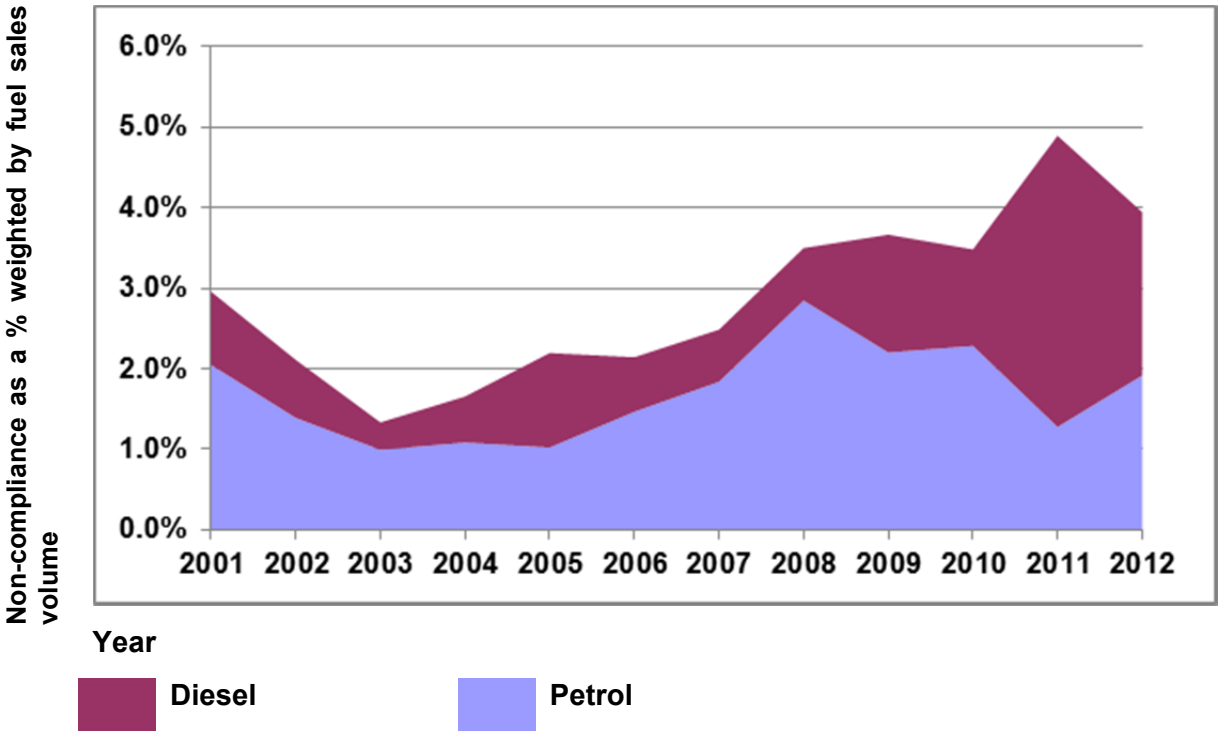
Figure 1-4: Temporal trends in sample quantities



*** Excludes France in 2003 - 2005, as no submissions were provided. Excludes Luxembourg in 2007 to 2009 and Malta in 2006 and 2009 as no reports were provided. Also, the EU expanded in 2004, 2007 from 15 to 27 Member States.**

Non-compliance of individual sample tests against petrol fuel standard EN 228 have decreased in 2012 compared to 2011, with non-compliances for diesel against EN 590 increasing in 2012. Samples exceeding tolerance limits and number of samples taken as reported by each Member State, combined with sales volume in each territory, have been used to determine volume weight of fuels exceeding tolerance limits, shown in Figure 1-5. This shows an overall decrease in 2012 compared to 2011; petrol has increased from 1.3% in 2011 to 1.9% in 2019, whilst diesel has decreased from 3.6% to 2.0%.

Figure 1-5: Temporal trends in total limit value non-compliances for petrol and diesel fuels



*** Excludes France in 2003 - 2005, as no submissions were provided. Excludes Luxembourg in 2007 to 2009 and Malta in 2006 and 2009 as no reports were provided. Also, the EU expanded in 2004, 2007 from 15 to 27 Member States.**

Key areas for improvement

- Some Member States are unable to confirm sales figures at the time of submitting the original report and request updates to their report after the submission deadline date. These requests are honoured wherever possible; however Member States should endeavour to submit their complete and accurate reports by the 30th June.
- Reporting templates have been developed and disseminated to all in order to enable accurate, consistent, replicable and comparable reporting. Member States are encouraged to provide their annual FQM report in the template provided to assist with the timely analysis and reporting of EU-wide results. The report template is also updated annually to reflect changes as new requirements superseded those outlined originally in Directive 98/70/EC. It is anticipated that a new Commission Decision will update the Common Reporting Format for Fuel Quality Monitoring reports.
- As in previous years, some Member States basic numerical data appears to be inconsistent when scrutinised by analysis. Most inconsistencies are minor – for example contradictory sample numbers when comparing those in reporting sheets with those cited in the sales reporting table. These errors are not insurmountable. Currently they delay reporting and in some cases make the correct number of samples impossible to determine, resulting in some anomalous figures.
- Many Member States did not report test results for all parameters covered under the Directive for each fuel grade marketed in their territory. In particular, many Member States are not yet testing for MMT. This includes Cyprus, Estonia, Finland, The Netherlands, Poland, Portugal and Slovenia. Many Member States have confirmed with fuel suppliers that MMT is not used in fuels sold in their territory but have not explicitly tested for it.
- The majority of Member States have submitted complete reports that contain all information requested for 2012 by the Commission. However, some have not provided additional statistical detail about sample results requested for 2012; where the 25% of sample values, and 75% of fuel sample values, occur. This information has been requested in order to enable more complete statistical analysis of the sample results and EU-wide comparison of fuel quality between Member States (though it is not mandatory). Countries who have not provided this additional level of detail include the Netherlands, Romania and Sweden. Bulgaria did not provide sufficient data for all petrol grades, but did for all diesel grades. Some other Member States did not provide full information for some grades.
- Some Member States are not providing information about test methods, or the source of sales data, in their reporting. This makes it difficult to assess compliance with the Directive. Member States could include more information in future reporting.
- The test which revealed the largest number of samples exceeding tolerance limits, was the summer vapour pressure limits test. Many Member States reported that this was a result of service stations being slow to transition from summer to winter fuel grade, and vice-versa due to low sales volumes. Member States could be clearer about the transition periods during which time the winter/ summer fuel grades are replaced with corresponding fuel grades for the opposite season. If Member States are reporting samples taken during the transition period, which are subsequently found to be out of specification, this should be made clearer.
- In some cases, it is impossible to determine whether Member States are reporting sufficient samples to comply with the Directive. This is either because they do not report sales volumes split by fuel grade, or because they are basing sampling volumes on historical sales (the most up-to-date information they had when deciding on sampling volumes). Some of this information was not made available to the

authors of this report.

- Some Member States are not fulfilling the minimum seasonal sampling requirements for some fuel grades, under EN 14274 and/or against the statistical model they are using. Others report that sufficient samples were taken but do not provide the results of testing, so it is not possible to demonstrate compliance. Examples include the Denmark, Germany, Luxembourg and Poland. Any samples taken from terminals/ refineries should be reported in addition to those taken at service stations, to highlight any issues of contamination in the supply chain, whilst still assessing fuels at point of use.
- Some Member States are using a statistical model that may not be the most appropriate for their country, or using a national model, but not providing sufficient evidence to demonstrate equivalence with EN 14274 standards.

Table of Contents

1 Introduction

Key Messages

This report summarises the quality of petrol and diesel in the Community for the year 2012.

Concerns over air quality and climate change have grown significantly in the past decade. Transport is a significant contributor to emissions of greenhouse gases and other pollutants that are harmful to human health. The European Union has introduced specifications on fuel quality in order to reduce these emissions.

This report provides an EU-wide summary of the analysis used to assess of the quality of automotive road fuels available in the community during 2012, and subsequent results. In addition to the EU-wide analysis, Member State reports are summarised in individual chapters. This report is accompanied by an online database, to be made publicly available by the Commission that provides Member State data in its raw form.

This section outlines the key amendments to the Directives and implications for FQM reporting. The specifications and reporting formats have evolved since the first Directive entered into force in 1998. The most recent amendments entered into force in 2009 are discussed in detail at the end of this chapter.

Directive 98/70/EC[3], introduced specifications on the quality of petrol and diesel available within the European Community. The specifications for petrol and diesel sold in the European Community are included in the Directive for each parameter to be reported. Three sets of fuel specifications are included in the Directive; the first entered into force on 1 January 2000, the second entered into force on 1 January 2004 and both were superseded by specifications outlined in Directive 2009/30/EC which came into force on 1st January 2010 (which amended and widened the scope of Member States FQM reporting obligations as well as updating fuel specifications). The Directives have also effected a reduction in the sulphur content of automotive road fuels with the maximum sulphur content limit of 10ppm coming into force on the 1st January 2009.

The Directive also stipulates that Member States must report on the quality of fuels sold in their territories. The original reporting format for this was laid out in Commission Decision 2002/159/EC of 18 February 2002[4]. Additional requirements were defined in the European Standard for Fuel Quality Monitoring Systems, EN 14274:2003, required from 2004 under Directive 2003/17/EC.

Directive 2009/30/EC[5] of 23 April 2009 has introduced a number of new requirements to fuel quality monitoring reporting, summarised briefly as follows:

- Article 7a – with effect from 1 January 2011, Member States are required to collect lifecycle GHG emissions characteristics for fuels within their national territories from suppliers with further obligations to reduce GHG emissions according to a predetermined timeline.
- Introduction of a new grade of petrol with up to 10% ethanol by volume.
- Provisions for a derogation whereby petrol fuels with added ethanol may be subject to higher summer vapour pressure limits, where the increase in vapour pressure corresponds with the additional ethanol content and the ethanol added is a biofuel.

[3] O.J. L 350 of 28.12.1998, p. 58
[4] O.J. L 53 of 23.2.2002, p.30
[5] O.J. L 140 of 5.6.1010

- Article 8a - Metallic Additives (MMT) to be limited to 6 mg Manganese per litre from 1 January 2011 (with a subsequent reduction in 2014) and the presence of MMT in fuels shall be labelled clearly at the point of sale.
- Revisions to the definition of 'Severe' or 'Arctic' conditions based on temperatures being below the EU average.
- A requirement for Member States to ensure that suppliers market petrol with a maximum oxygen content of 2.7 % and a maximum ethanol content of 5 % until 2013.

Member States are required, under the Directive, to report on fuel quality monitoring findings of the previous calendar year by 30 June. The first year of reporting was 2002. The 10 new Member States joining the EU in 2004 submitted their first reports in 2005 for the period between May and December 2004. Bulgaria and Romania joined the EU in 2007, and both countries voluntarily submitted reports for 2006. A summary of all the submissions received for the years 2001 to 2011 have been presented in previous reports.

The FQM reporting template was originally developed in line with Commission Decision 2002/159/EC and is updated on an annual basis to reflect changing requirements and to encourage accurate and complete reporting from Member States. The Member States submitted reports for 2012 with varying degrees of completeness and accuracy. Some Member States still do not sample and test according to test methods outlined in the Directive.

The majority of Member States have submitted complete reports that contain all information requested for 2012 by the Commission. However, some have not provided additional statistical detail about sample results requested for 2012; where the 25% of sample values and 75% of fuel sample values occur. This information has been requested in order to enable more complete statistical analysis of the sample results and EU-wide comparison of fuel quality between Member States. Countries who have not provided this additional level of detail are The Netherlands, Romania and Sweden.

Overall, in 2012 there has been a distinct improvement in the completeness, quality and timeliness of Member State reporting under the Fuel Quality Directive compared with recent years.

1.1 Report Structure

The original FQM reporting template was developed in 2004, agreed with the European Commission and validated at expert meetings with stakeholders. The stakeholders included Member State and EU candidate country representatives, the auto industry and the oil industry. The reporting format for 2012 can be found in the Appendix in section 34.2.

Section 1	This introductory section outlines the background and context of the Fuel Quality EU Summary report.
Section 2	Outlines the format for the summary chapter on each EU Member State, along with an explanation of the fuel quality monitoring and reporting requirements assessed in each part of the chapter.
Sections 3 & 4	Provides an overall EU summary, discussion of the 2012 reporting and conclusions/recommendations for future reporting.

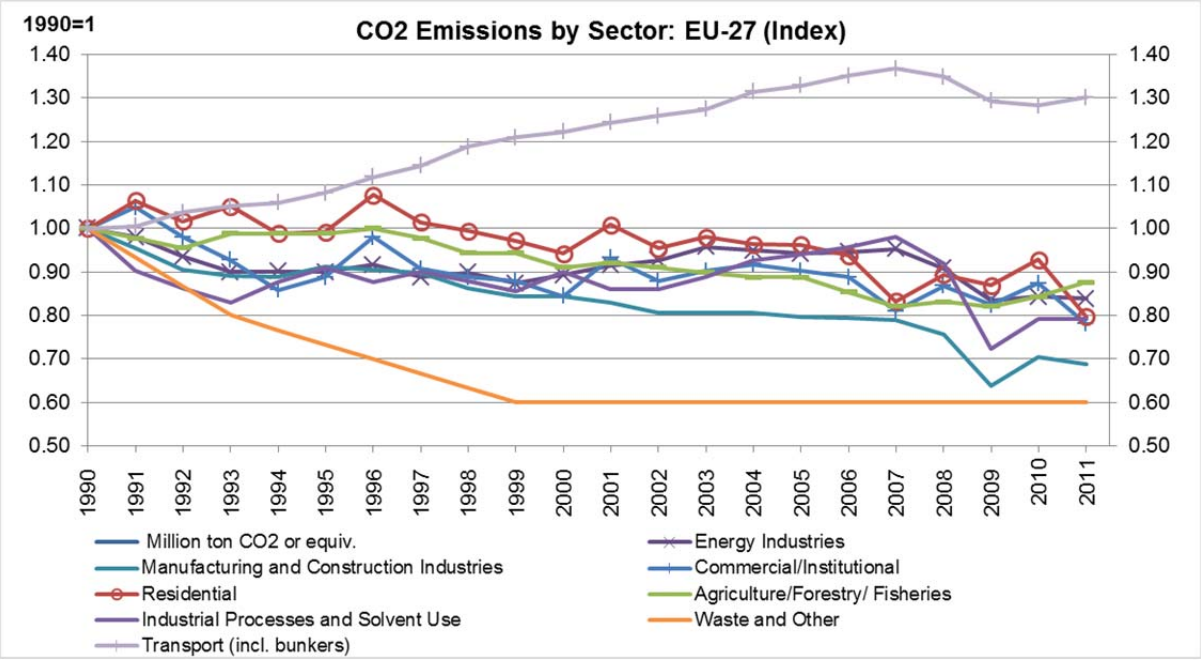
Section 6 - 31	Provides a more detailed summary of the information reported by individual EU Member States. This includes information on: • Fuel availability; • Summary descriptions of the monitoring systems in place; • Detailed descriptions of the fuel quality monitoring system; • Compliance with sampling, reporting requirements and with Directive 98/70/EC limits; • Temporal trends; • Sales of fuels per Member State; • Statistical Analysis
Section 32	Discussion and Conclusion
Section 33	Appendices which provide further detail on the specifications used for the analysis, the 2012 reporting format.

1.2 Context

Concerns over air quality and climate change have grown significantly in the past decade. Reduction of fuel consumption and associated greenhouse gas and other emissions has therefore become a higher priority for governments, the public, vehicle manufacturers and the fuel industry alike. Transport is a significant contributor to carbon dioxide (CO_2), as well as other emissions, and with transport demand ever increasing. The extent of the recent growth in transport emissions is reinforced by Figure 1-1, which presents a sectorial split of trends in CO_2 emissions from 1990 - 2011. Whilst the CO_2 emissions from other sectors have levelled out or have begun to decrease, transport's CO_2 emissions have risen steadily since 1990, with only a dip after 2007 - attributed in the most part due to the global economic downturn.

By far the largest single portion of transport emissions derives 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, CO_2 emissions, air quality and their influence on fuel quality legislation.

Figure 1-1: Carbon dioxide emissions by sector EU-27 (indexed)[6]



Notes:

i) The figures include international bunker fuels (where relevant), but exclude land use, land use change and forestry.

ii) The figures for transport include bunker fuels (international traffic departing from the EU), pipeline activities and ground activities in airports and ports

iii) "Other" emissions include waste and agriculture.

1.2.1 Fuel Consumption and Carbon Dioxide Emissions

The Community's strategy[7] to reduce CO_2 emissions from passenger cars and improve fuel economy is aimed at delivering an average CO_2 emission value for new passenger cars. The automobile industry has also committed itself through voluntary agreements to improving the fuel economy of vehicles. Additionally on 7 February 2007, the Commission adopted Communication (COM (2007) 19) outlining a comprehensive new strategy to reduce CO_2 emissions from new cars and vans sold in the European Union. Furthermore, on 17 December 2008, the European Commission adopted a new schedule (Regulation *(EC) No 443/2009)* to phase in emission standards. The Commission has also introduced compulsory requirements aimed at the gradual decarbonisation of road fuels, through the amendment of the Fuel Quality Directive under Directive 2009/30/EC (discussed later in Section 1.2.4).

The automobile industry 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. Under the Directive 2009/30/EC, Member States have been required to implement *mandatory full conversion* to sulphur free fuels from 1 January 2009 onwards. This represents the third year of reporting since mandatory conversion.

In previous years, this report placed significant emphasis on the sulphur content of fuel grades. These sections have now been reduced as all fuel grades are now 'sulphur free' fuels (<10ppm sulphur content). Individual incidences where sample results indicate that the

[6] Graph based on figures in DG Energy (2010) *EU energy and transport in figures Statistical Pocketbook 2012* Luxembourg, Publications Office of the European Union, 2012. Available online at: http://ec.europa.eu/energy/observatory/statistics/statistics_en.htm

[7] (COM(95) 689 final, supported by the Council in 1996 and the European Parliament in 1997

sulphur content exceeds Directive specifications will be highlighted within Member State report sections compliance tables and also within the EU Summary.

1.2.2 Life Cycle Greenhouse Gas Emissions

Transport fuel makes a significant contribution to overall Community greenhouse gas (GHG) emissions. One of the key changes in reporting requirements resulting from Directive 2009/30/EC is Article 7a on life cycle greenhouse gas (GHG) reporting. This article states that Member States must designate the supplier(s) responsible for monitoring and reporting life cycle GHG emissions per unit of energy from fuel and energy supplied. From 1 January 2011 onwards, the suppliers are required to report annually:

a) Total volume of each type of fuel or energy supplied, indicating where purchased and its origin;

b) Life cycle GHG emissions per unit of energy.

The aim of Article 7a is to ensure that a fuel supplier makes choices to achieve a reduction in aggregate GHG intensity for the fuel supplied to road transport and additionally to non-road mobile machinery (NRMM), inland waterways and rail networks. Directive 2009/30/EC also introduces a 10 ppm sulphur limit on NRMM fuels effective from 2011. Suppliers should, by 31 December 2020, reduce life cycle GHG emissions by up to 10% per unit of energy compared to 2010 levels. At least 6% of this target is expected to be achieved via the increased use of biofuels, the increased use of alternative fuels, and/or reductions in flaring and venting emissions and fuel production and refining facilities (i.e. reduction in lifecycle emissions of conventional fossil petrol and diesel fuels). Subject to review, a further 2% reduction should be obtained through the use of environmentally friendly carbon capture storage technologies and electric vehicles. An additional further 2% reduction should be obtained through the purchase of credits under the Clean Development Mechanism of the Kyoto Protocol.

Annex D of Directive 2009/28/EC sets out a list of typical and default life cycle GHG emissions for a number of biofuel and bio liquid production pathways. The default values will be used unless the producer can demonstrate their emissions are lower than those that were assumed in the calculation of the default values. Annex C of the Directive sets out the methodology for calculating the life cycle GHG emissions from the production of biofuels. The biofuels used for compliance with the 6% reduction in life cycle GHG emissions should be sustainable and are required to fulfil sustainability criteria. These sustainability criteria are set out in Directive 2009/28/EC. The life cycle GHG emissions of fossil fuels that should be used are the latest available actual average GHG emissions from fossil fuels, however if no such data is available then 83.8 gCO_2eq/MJ should be used as found in Annex C.

1.2.3 Air Quality

In September 2005, the European Commission adopted a Thematic Strategy on Air Pollution, which defined the ambition level for further improvements in some key environmental problem areas related to air pollution in the European Community up to the year 2020. One of the key measures of the Thematic Strategy was a proposal for a new Directive on air quality, bringing together a number of separate instruments into a single legal act[8], as well as introducing new limit values and exposure related objectives for $PM_{2.5}$. This new Directive[9] was adopted on 21 May 2008. Member States have two years from the date of adoption to transpose the Directive; until then the existing legislation generally applies, with some provisions of the new Directive to be implemented sooner.

[8] The Framework Directive 96/62/EC, the first Daughter Directive 1999/30/EC relating to limit values for sulphur dioxide, nitrogen dioxide and oxides of nitrogen, particulate matter and lead in ambient air, the second Daughter Directive 2000/69/EC relating to limit values for benzene and carbon monoxide in ambient air, the third Daughter Directive 2002/3/EC relating to ozone in ambient air, and the Exchange of Information Decision 97/101/EC.

[9] Directive 2008/50/EC on ambient air quality and cleaner air for Europe.

Releases of carbon monoxide (CO), hydrocarbons (HC), nitrogen oxides (NO_x) and particulate matter (PM) from vehicles are covered under the vehicle emission standards (so-called 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 emissions over a standard drive cycle. There are currently six stages for cars and Light Commercial Vehicles (LCVs, i.e. vans) – conventionally labelled with Arabic numerals - that have progressively tighter emissions limits. Euro 4 has been in force for new types of vehicles since 1 January 2005 and since 1 January 2006 for all new vehicles. A further two new standards, Euro 5 and Euro 6, were introduced in Regulation No 715/2007[10], June 2007. Euro 5 has been in force since 1 September 2009 and sets tighter emission limits of particles and NO_x for new cars and vans sold in the EU, for example an 80% reduction in PM emissions and a 20% reduction in NO_x emissions from diesel cars compared with Euro 4 limits. Euro 6, which will enter into force on 1 September 2014, sets significantly lower limits for NO_x emissions from diesel cars (68% lower than the current Euro 4 limits).

The emission classes for Heavy Duty Vehicles (HDVs) are also conventionally labelled with Roman numerals. Euro IV entered into force on 9 November 2006 for new types of vehicles, while Euro V entered into force on 1 October 2008 and set a 43% reduction in the NO_x emission limit compared with Euro IV. In December 2007 the European Commission released a proposal for a further, Euro VI stage which would apply from 1 April 2013 for new vehicle types and 1 October 2014 for all new registrations[11]. Under Euro VI, the emission limits for HDVs would be further reduced by 80% for NO_x and 68% for PM versus Euro V.

The stakeholder consultations for the Euro V and VI emission limits have shown that the only parameter of importance is the availability of sulphur-free fuels, which has since been implemented.

1.2.4 Fuel Quality

There are currently five key documents that set requirements for the quality of fuel sold in the EU and the monitoring and reporting of fuel quality. These are as follows;

- Directive 98/70/EC;
- Commission Decision 2002/159/EC;
- European Standard EN 14274:2003;
- Directive 2003/17/EC;
- Directive 2009/30/EC

The parameters covered in the fuel quality standards outlined in Directive 98/70/EC fall loosely into two categories. The first include physical properties, such as octane number (RON and MON) for petrol; Cetane number and density for diesel. These need to be within certain limits in order for internal combustion engines to function efficiently, and have an impact on emissions of both air quality pollutants and CO_2. The second category includes 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.

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,

[10] Regulation No 715/2007 on type approval of motor vehicles with respect to emissions from light passenger and commercial vehicles (Euro 5 and Euro 6) and on access to vehicle repair and maintenance information. Available at: http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2007:171:0001:0016:EN:PDF

[11] Proposal for a Regulation of the European Parliament and of the Council on type-approval of motor vehicles and engines with respect to emissions from heavy duty vehicles (Euro VI) and on access to vehicle repair and maintenance information. Available at: http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2007:0851:FIN:EN:PDF

oxidation catalysts, NO_x adsorber catalysts (NACs) and particulate traps. The mandatory limit for sulphur in 2005 was set at 50 ppm for petrol and diesel. Some EU states already provided fuel in previous years at <50 ppm ahead of this mandatory requirement. Debate as to whether the 2005 limit should be reduced further prompted the EC to launch a consultation with stakeholders in 2000[12]. The decision to amend Directive 98/70/EC resulted in a requirement for sulphur-free fuel (<10 ppm sulphur) to be made available *"on an appropriately balanced geographical basis"* from January 2005[13] (with annual reporting in availability[14]). Full mandatory conversion to sulphur-free petrol was to be implemented and achieved before 2009. The Commission did not find any grounds to propose prolonging that date. These requirements are implemented under the amended Directive 2003/17/EC[15].

The European Commission has conducted a review of the fuel quality Directive (98/70/EC). Following this review, the Commission made a proposal in early 2007 to modify certain aspects of the Directive, which was subsequently adopted as Directive 2009/30. This is discussed in more detail later in this section. Further information on fuel quality monitoring and the Fuel Quality Directive is available from the Commission's website[16].

1.2.4.1 Reporting on Fuel Quality from 2005

Amendments to Directive 98/70/EC made in 2003 (Directive 2003/17/EC) required Member States to develop Fuel Quality Monitoring Systems (FQMS) in accordance with European Standard EN 14274:2003 and to implement these monitoring systems by 1 January 2004. A summary of monitoring and reporting requirements under the standard follows:

1. Specification of information requirements in order to set up the FQMS, including regional level data (number of refuelling stations, sales, population and number of vehicles);
2. The system is to be run twice a year, for the summer and the winter periods (as summer and winter fuels have different specifications);
3. Specification of the minimum number of sample sites of fuel grades required (in order to make the FQMS as robust and representative as possible), depending on the statistical model being used (chosen depending on the size of the country and how it is split into regions);
4. Specification of a list of all retail (public vehicle) and commercial (private fleet) fuel dispensing sites is required (by region) and that sampling should take place across randomly selected samples of these;
5. Specification of the minimum number of samples/sites for fuel grades with less than 10% of sales.

Directive 2003/17/EC required that Member States report on the geographical availability of sulphur free fuels during the phase-in period before all fuels had to become sulphur-free, but neither the Directive nor EN 14274 defined what the appropriate geographical availability should be or how to measure this. These issues were addressed in Commission Recommendation 2005/27/EC, which contains guidance on what constitutes appropriate geographical availability and suggests a range of methods (options) by which Member States can calculate and report on geographical availability. However, the recommendations were not mandatory and many Member States did not supply this level of detail in their reports during the phase in period for sulphur-free fuels.

[12] 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.
[13] Directive 98/70/EC also specifies that Member States shall adopt and publish the laws, regulations and administrative provisions necessary to comply with the Directive by 30 June 2003.
[14] Article 8 of Directive 98/70/EC, as amended by Directive 2003/17/EC
[15] O.J. L76 of 22.3.2003, p. 10
[16] Fuel Quality Monitoring: http://ec.europa.eu/environment/air/transport/fuel.htm;
Fuel Quality Legislation: http://ec.europa.eu/clima/policies/transport/fuel/documentation_en.htm

The progressive adoption of EN 14274 by Member States is leading to greater consistency in the data available for assessment of the various fuel quality parameters and Member States have been making efforts to improve their understanding of reporting requirements for the purposes of this summary report. However, there is an option in Directive 2003/17/EC, in which: *"the use of an alternative fuel quality monitoring system may be permitted provided that such a system ensures results of equivalent confidence"*. This means that some Member States use alternative systems, i.e. national systems, thus reducing both the ease of direct comparisons between different Member States and the guarantee of availability of certain data.

1.2.4.2 Reporting on Fuel Quality from 2009

EU Directive 98/70/EC as amended specifies mandatory quality requirements for all petrol, diesel and gas oil for use in non-road mobile machinery (NRMM) sold in the EU. The specified quality requirements are designed to deliver air quality benefits directly (e.g. by limiting lead and benzene content of petrol) or indirectly (e.g. by limiting sulphur content to enable efficient and durable operation of catalytic after treatment systems) and to standardise key operability parameters (e.g. octane rating of petrol and cetane number of diesel) to support a common market for vehicles.

The Commission's amendments to the original Directive (Directive 98/70/EC) delete a number of now obsolete requirements and Member States are required to bring laws, regulations and the administrative provisions necessary to comply with amendments to the Directive into force, no later than 31 December 2010. In addition, the amendments make a number of changes to requirements, summarised briefly as follows:

1. Introduction of a requirement for fuel suppliers to report on the lifecycle greenhouse gas emissions of their fuels.
2. Revision to the definition of 'Arctic or severe' conditions based on winter temperatures being below the EU average.
3. Amendment to the maximum distillation point of diesel fuels and gas oils for Member States with severe weather conditions.
4. Introduction of a new grade of petrol with up to 10% ethanol by volume (an increase in the current limit of 5%).
5. A requirement to update EN 590:2004 diesel fuel standards to enable placing diesel fuel with a higher bioethanol content on the market than provided for in the standard.
6. Creates provision for derogation (subject to Commission assessment), whereby petrol fuels with added ethanol may be allowed a higher summer vapour pressure where the increase in vapour pressure corresponds with the additional ethanol content and ethanol added is a biofuel.
7. Member States are required to ensure that suppliers market petrol with a maximum oxygen content of 2.7 % and a maximum ethanol content of 5 % until 2013. They may require the placing on the market of such petrol for a longer period if Member States consider it necessary. They shall also ensure the provision of appropriate information to consumers concerning the biofuel content of petrol and, in particular, on the appropriate use of different blends of petrol.
8. The Commission has been tasked with developing a test methodology for approving metallic additives for use in fuels.
9. Additionally, the presence of methylcyclopentadienyl manganese tricarbonyl (MMT) in fuel shall be limited to 6mg of manganese per litre from 1 January 2011; the limit will be reduced to 2mg of manganese per litre from 1 January 2014.

2 Member State Summaries: Reporting Format and Requirements

Key Messages

The Reporting Template has been provided to help Member States to comply with Fuel Quality Directive requirements. Use of the template is recommended to ensure that the reported information is complete, thus reducing the need for further clarification to be sought.

This section provides an outline of the presentation and format of Member State Fuel Quality Monitoring summary sections.

Information in the Member State summary sections has been provided by Member States either as part of their Fuel Quality Monitoring report for 2012, or following a request for clarification - where necessary.

The EU Fuel Quality Monitoring Submissions Reporting Template (Appendix 34.2) was designed based on the reporting requirements of the Directives and was updated most recently for 2012 reporting. The template has been provided to help Member States ensure that the information they report is complete, thus reducing the need for further clarification to be sought.

The Reporting Template is divided into mandatory reporting requirements under the Directives (including EN 14274 requirements) and optional reporting fields as per the Commission Decisions. Examples of these supplementary fields include test methods used for each parameter, which is important information to determine compliance with limit values, and the number of samples non-compliant with the limits and their values, which give an indication of the scale of the issue. Completion of these parts of the template reduces the need to seek clarifications or additional information from Member States. Provision has been made in the specifically designed reporting template to gather supplementary information in order to assist in the evaluation of the accuracy, reliability and compliance of Member States Fuel Quality Monitoring Systems.

The information reported by individual Member States, as part of their annual submission of national fuel quality data, includes:

- Sales quantities of different fuel grades;
- Summary descriptions of the monitoring systems in place;
- Compliance with sampling and reporting requirements and with Directive 98/70/EC limit values in the analysis of samples.
- Life cycle greenhouse gas emissions

Box 1 summarises the requirements of the current five key documents relating to fuel quality monitoring and reporting in the EU.

Box 1: Key documents and requirements relating to fuel quality

Directive 98/70/EC

relating to the quality of petrol and diesel fuels and amending Council Directive 93/12/EEC

Specifies for the parent fuel grades, RON>91 petrol, RON>95 petrol and diesel:

- Limit values (and tolerance limits according to EN ISO 4259:1995) for each fuel parameter. The limit values are either a minimum (e.g. RON) or maximum (e.g. vapour pressure, DVPE).
- Test methods for monitoring the above.

Two sets of fuel specifications are included in the Directive, the first entered into force on 1 January 2000 and the second entered into force on 1 January 2005 (as amended by Directive 2003/17/EC). The Directive also stipulates that Member States are required to report summaries of the quality of fuels sold in their territories.

Commission Decision 2002/159/EC

on the common format for the submission of summaries of national fuel quality data

- Provides a common report template covering all parameters in Directive 98/70/EC.
- Reports to be submitted in both paper and electronic formats.
- Reports to be submitted by 30 June each year, data for the preceding calendar year.

European Standard EN14274:2003

Automotive fuels – Assessment of petrol and diesel quality – Fuel quality monitoring system (FQMS)

- Each Member State must establish a **Fuel Quality Monitoring System (FQMS)**, taking into account factors such as the number of refineries supplying the market, the number of fuel grades available and the sales volumes of different types of fuel.
- Builds on and expands the reporting format specified in Commission Decision 2002/159/EC.
- Summary of sampling requirements:

Sampling parameter	Requirement
By whom	Sampling by appointed organisations; analysis by accredited laboratories
Where	Refuelling stations
When	Separate summer and winter sampling and reporting periods
Number of sites	Minimum numbers for each of the summer and winter periods, according to statistical Model A, B or C or a national system.
Sample selection	Randomly in each region, to fulfil the minimum number of sample sites.
Methods	Specified in Directive 98/70/EC or EN228:2008 (petrol) and EN590:2009 (diesel) and EN 14275:2003.

European Standard EN14275:2003

Automotive fuels - Assessment of petrol and diesel fuel quality - Sampling from retail site pumps and commercial site fuel dispensers

- Determines sampling methodology and analysis and testing of samples for petrol and

diesel automotive fuels at retail site pumps and commercial fuel dispensers.

Directive 2003/17/EC

amending Directive 98/70/EC relating to the quality of petrol and diesel fuels

- In each Member State from 1 January 2005, sulphur-free (<10ppm) fuels were required to be made available "on an appropriately balanced geographical basis". From 1 January 2009 this limit was reduced to 10ppm for both petrol and diesel fuels.
- Requires Member States to annually report on the availability of sulphur-free fuels.

Directive 2009/30/EC

amending Directive 98/70/EC relating to the quality of petrol and diesel fuels

Key amendments brought into force by this Directive include:

- Article 7a - GHG Reporting whereby Member States are required to collect lifecycle GHG emissions characteristics for fuels within their national territories from suppliers with further obligations to reduce GHG emissions according to a predetermined timeline.
- Introduction of a new grade of petrol with up to 10% ethanol by volume.
- Provisions for a derogation whereby petrol fuels with added ethanol may be subject to higher summer vapour pressure limits where the increase in vapour pressure corresponds with the additional ethanol content and ethanol added is a biofuel.
- Article 8a - Metallic Additives (MMT) to be limited to 6 mg Manganese per litre from 1st January 2011 (with a subsequent reduction in 2014) and the presence of MMT in fuels shall be labelled clearly at the point of sale.
- Revisions to the definition of 'Severe' or 'Arctic' conditions based on temperatures being below the EU average
- A requirement for Member States to ensure that suppliers market petrol with a maximum oxygen content of 2.7 % and a maximum ethanol content of 5 % until 2013.

The following sections outline the reporting structure used to summarise Member State reports.

2.1 Fuel Availability

For each Member State a table is presented listing the fuels that were reported to be available nationally, where full sales data were provided and the category under which sample analysis results were reported.

Sales in the EU of fuels containing more than 50ppm sulphur content were no longer permitted from 1 January 2005 and sales of fuels containing more than 10ppm sulphur content were no longer permitted from 1 January 2009. Therefore fuels under categories 1, 2, 4, 5, 7, 8, 10, 11 (petrol) and 13, 14 (diesel) are no longer available and have been removed from the reporting template.

Table 2-1: Basic European fuel grade categories

Basic fuel grades	Fuel ID
Regular unleaded petrol (minimum RON = 91 & < 10 ppm sulphur)	**3**
Unleaded petrol (minimum RON = 95 & < 10 ppm sulphur)	**6**
Unleaded petrol (minimum 95 =< RON < 98 & < 10 ppm sulphur)	**9**
Unleaded petrol (minimum RON = 98 & < 10 ppm sulphur)	**12**
Diesel fuel (< 10 ppm sulphur)	**15**

2.1.1 Sales, sampling and reporting

2.1.1.1 Sales

This section shows the proportion of each of the fuel grade categories sold in the Member State. The charts are useful for comparing the degree to which different fuel grades have permeated the market in each Member State, as there is much variability across the EU.

There are three distinct levels of fuel grade categorisation, each a subset of the former level, under which Member States have previously reported sales quantities (or sample analyses). These levels are as follows:

1) **Parent fuel grades** – defined according to Directive 98/70/EC (i.e. minimum RON 91 unleaded or minimum RON 95 unleaded petrol);
2) **National fuel grades** – defined at a national level with additional requirements to the Directive parent grades, for example minimum RON 98 unleaded petrol, or sulphur-free fuels;
3) **Marketed fuel grades** – fuels may be marketed and sold by fuel suppliers as distinct grades with additional specifications beyond Directive and national requirements, e.g. higher RON levels or sulphur-free fuel grades.

In previous years, the Sulphur Content of fuel grades also represented a distinct categorisation, however this category is no longer applicable as all fuel grades are now 'sulphur free' fuels (containing less than 10ppm sulphur content).

2.1.1.2 Sampling and reporting

For each Member State a summary of reported sampling is provided, along with an assessment of compliance with the various elements of Directive 98/70/EC and EN14274.

Directive 98/70/EC specifies the parameters that are to be monitored for petrol and diesel fuels (19 and 6 parameters respectively). Member States are required under the Directive to use a monitoring system based on European Standard EN 14274, unless given dispensation by the European Commission to use their own national system where it is of equivalent statistical confidence. Where a National system has been utilised, information should be provided to demonstrate equivalence with EN 14274.

EN 14274 specifies separate reporting for summer and winter periods, and sets minimum sampling numbers for each fuel (dependant on the statistical model used and sales proportion). The standard specifies a minimum number of samples to be taken per fuel grade (in each of the winter and summer periods), see Table 2-2. This is to ensure a high level of statistical confidence (95%) that the results are representative of all the fuel sold in the territory.

Table 2-2: Fuel dispensing site sampling requirements for different Fuel Quality Monitoring Systems

Model	Samples per grade and per winter and summer period*	
	Small Country	Large Country
EN 14274 Statistical Model A	50	100
EN 14274 Statistical Model B	100	200
EN 14274 Statistical Model C	50	-
National System	-	-

* Annual sampling requirements are therefore double the table values per grade.

Any terminal and/ or refinery sampling should be carried out in addition to the minimum number of samples specified above.

The countries defined as "large" are France, Germany, Italy, Poland (although Poland have reported as though they are a small country), Spain and the UK according to the definition contained in the European Standard EN 14274 (greater than 15 million tonnes automotive fuel sales per year). Individual Member States sections compare the FQM implemented by each Member State against the requirements outlined in Table 2-2.

The standard also specifies that individual samples are to be taken at separate refuelling stations. In Member States where sampling also takes place at other points of the distribution chain, the number/proportion of samples taken at refuelling stations needs to be reported and samples taken from other points in the distribution chain should be taken *in addition* to those from refuelling stations.

Definitions of the three statistical models from the standard are presented in Box 2, with the corresponding total sampling requirements previously identified in Table 2-2. In the macro region model (A), regions are defined with similar fuel sales and number of supply sources. For very small countries, such as Luxembourg, Malta and Cyprus, where there is basically only supply from one source, it does not make sense to divide the country into separate regions; therefore Model C may be applied. Other Member States, such as Ireland have also previously chosen to use Model C and in these cases a clear rationale for its use should be demonstrated on the basis of both number of fuel sources/supply points and size/possibility of division of the territory into regions. Similarly, Member States choosing to use own national systems should provide information on the fuel supply situation in their country and the statistical confidence of their system in order to demonstrate compliance with the Directive.

Box 2: Models for the FQMS defined in EN 14274:2003

Model A – Macro regions

In this model, the regions within the country are grouped (preserving some geographical identity) into macro regions so that they have similar total sales volumes relative to each other and also about the same number of different supply sources. This approach is recommended for countries as it is designed to capture fuel variation efficiently and hence requires a smaller number of samples. If geographical, and destructive or other circumstances do not allow fulfilment of the requirements for the design of this preferred model, Model B shall be considered the next best model.

Model B – Non-macro region

If the construction of macro regions (based on fuel supply patterns) is not possible within the country, then the country shall be divided into regions using only geographic and administrative criteria. To ensure that fuel variability is reliably captured, a large number of samples per grade are required: 100 for small-size countries and 200 for large-size countries.

Model C – Non-region model

If the country is small-sized and when it can be demonstrated that a division into macro regions or non-macro regions is not possible, having considered the procedures and provisions given in this European standard, then the country shall be considered as one region for sampling purposes.

2.2 Fuel Quality Monitoring

2.2.1 Description of system

This section outlines a summary of the key information components of the Member States individual Fuel Quality Monitoring System (FQMS), under the following headings:

Responsible organisation(s)	The organisation responsible for monitoring and reporting on fuel quality in the Member State, but not necessarily the actual sampling organisation which is often carried out by fuel companies or the organisation responsible for collation of fuel sales data.
Fuel Quality Monitoring System (FQMS)	EN 14274 statistical models A, B or C, or a national system.
Country Size	Classified as: Large (greater than 15 million tonnes automotive fuel dispensed per year), or Small.
Summer Period	1 May to 30 September (normal), or 1 June to 31 August (for Member States experiencing arctic or severe weather conditions). Different grades are available in the summer and winter periods. As far as reporting is concerned, the summer period is mainly relevant to vapour pressure limit values, however separate reporting tables on analyses for summer and winter periods are specified in EN 14274.
Location(s) of sampling	At refuelling stations (as required by EN 14274), and in addition, refineries or terminals/depots

Time/frequency of sampling	EN 14274 requires that sampling is undertaken in both the winter and summer periods
Specification of test methods	As per Directive 98/70/EC (as amended) tests should be carried out using methods specified in EN 590 (diesel) and EN 228 (petrol).
Collection of sales data	Details of who collates sales data; by the responsible organisation, from fuel companies or other sources.
Other details	This could include (for example) the number of refineries and distribution of fuel in the country, progress on implementation of EN 14274 or even full details and rationale for the use of a national system, plus any other details the Member State regards as pertinent to reporting.

2.2.2 Compliance with fuel quality limit values

This section provides details for each grade of fuel sold in the Member State on any non-compliance with the limit values specified in Directive 98/70/EC, and associated tolerance limits for the test methods. Where information has been provided by the Member States, it gives an indication of the number of non-compliances, their magnitude and statistical significance.

Directive 98/70/EC sets test methods, limit values and tolerance limits for a total of 19 parameters for petrol and 6 for diesel. The permitted test methods are those specified in Directive 98/70/EC or EN 228:2000 for petrol and EN 590:2000 for diesel, or later versions.

Each test method has a tolerance limit, based on the reproducibility of the method. The tolerance limit is the value that gives 95% statistical confidence of being equal to the limit value.

For each parameter Member States are required to report the minimum, maximum, mean and standard deviation of values, as per the reporting template. In addition from 2009, Member States were asked to provide the median for each parameter in order to aid statistical analysis. From 2010, Member States have been asked for two additional pieces of information to aid statistical analysis of EU-wide fuel quality; the first and last quartile of results (e.g. the results that represent 25% from minimum and 75% from minimum of all sample results). The Directive (and European Standard) does not require Member States to report the test method used for each parameter, although this information is required to confirm whether samples have exceeded limits where there is more than one possible method. Additional information is usually sought from Member States in order to determine compliance with the tolerance limits in these cases, because the test reproducibility (determining the tolerance limit) varies according to each specific analysis. Fields are provided in the Excel reporting template to allow Member States to provide this information with their submission.

This situation has been improved upon for the petrol and diesel distillation limit values in Directive 98/70/EC, for which the European Committee for Standardization (CEN) derived fixed precision statements (reproducibility) based on an extensive analysis of large sets of distillation data of petrol and diesel from national monitoring schemes. As recommended by CEN, these fixed precision statements were incorporated into the Excel reporting template and are now used to determine compliance where the reproducibility of a specific test is unavailable.

To facilitate improved compliance with fuel quality standards, Directive 2003/17/EC states *"Member States shall determine the penalties applicable to breaches of the national*

provisions adopted pursuant to this Directive. The penalties determined must be effective, proportionate and dissuasive." The Excel reporting template provides fields for Member States to describe punitive action taken against companies supplying non-compliant fuel.

In evaluating different Member State submissions there are clear variations in trends that emerge. Sample analysis results for different parameters show different trends with regards to levels of compliance with limit values and the range distribution of sample analysis results in relation to the mean and Directive limit values. In some cases the mean of sample values can appear very close to the Directive limit values even without any samples reported as exceeding tolerance limits. As part of the assessment of the compliance in relation to these analyses it is therefore useful to understand the reasons behind these differences.

Discussion with members of CEN Technical Committee 19, which deals with fuel quality issues, has helped provide valuable insight in this area. A summary of the parameters covered by the Directive and the likely proximity of the market quality to the limit values is presented in Box 3. Essentially there are at least three types of sample analysis distributions associated the different fuel quality parameters:

1. Distributions for properties of relevant "economic" value, e.g. Research Octane Number (RON) for petrol and Cetane Number (CN) for diesel. In this case most results are just above the limit value (95 for RON and 51 for CN) and the distribution of sample analysis results is quite asymmetrical.
2. Distributions for properties that are quite easily fulfilled, e.g. percentage of petrol evaporated at 100°C. In this case the distribution of sample values is more normal (closer to a more typical symmetrical 'bell shaped' distribution).
3. Distributions for properties with tighter limits to be adopted in the near future (e.g. moving from <50ppm to <10ppm sulphur). In this case distributions are again not very normal as the decrease of sulphur content follows strategies that can be different from company to company and from region to region (and from country to country).

There is therefore no typical distribution curve associated with each test method (and these distributions can also change over time). A variety of functions might be generated to describe the distribution, based on the summary data supplied by each Member State, but these would not provide much insight unless one understands what is really motivating the particular refiner to meet the specification. The fuels supplied to many Member States are sourced from quite a wide variety of different companies (and different refineries from the same company). Therefore individual Member State submissions on analysis of sampling carried out across the fuel network will most likely contain a mix of fuels produced by different refineries with varying (and unknown) strategies. This means that the actual distribution curves of sample analysis would vary depending on the combination of these different fuels.

As a result there does not appear to be a suitable way available to statistically verify Member State submission analysis results with a level of demonstrable confidence with the available information currently provided. This would only be possible with the full sample analysis dataset, which would require a very significant additional reporting burden on Member States as well as a considerable increase in submission evaluation effort. There does not appear to be evidence to suggest this level of additional effort would provide significant benefits to the fuel quality monitoring process to warrant consideration.

Box 3: Key fuel parameters as regulated by the FQD

The following provides a brief overview (provided by CEN) of the parameters covered by the Fuel Quality Directive and the likely proximity of the market quality to the maximum or minimum limit value specifications:

Petrol

- *Research Octane Number (RON)*: It is usual for a refinery to be tight to specification on either RON or MON - it is unusual to be tight to both specs.
- *Motor Octane Number (MON):* This is usually the most limiting specification for European refineries.
- *Vapour Pressure for the Summer Period:* It is always difficult to meet this specification, whilst maintaining octane and not exceeding the maximum aromatics specification. Refineries try to maximise butane into the blend as it provides high octane but also has a high vapour pressure. The problem is made worse when ethanol is blended to the petrol due to its azeotropic effect causing a rapid increase in vapour pressure. It is therefore expected to see all countries tight to this specification.
- *Distillation:* This is generally not tight to specification, but may change in the future with the blending of ethanol, which causes a shift in the distillation curve.
- *Hydrocarbon Analysis:* Generally refineries will be tight to the maximum aromatics and benzene specifications. Some refineries will be tight to the maximum olefin specification but this is more unusual.
- *Oxygenates:* Due to the biofuels obligations in Europe there will be a move to be tight to the maximum ethanol, ETBE and oxygen specifications in future years.
- *Sulphur Content:* There are strong economic and supply reliability reasons for refiners to blend tight to the sulphur specifications. The industry tends to run tight to spec to maximise the hydrotreating catalyst lifetime and the energy consumption at the refinery. Thus for a 10ppm max sulphur specification blending is usually targeted around 8ppm max to account for downstream contamination issues in the distribution system where product can interface with 1000ppm gas oil and kerosene. Because of the uncertainty in testing this means that the real blend target can be as low as 6ppm. This is reaching the limit of the desulphurising capacity of the refinery and rapidly increasing energy consumption and reducing the catalyst life. The 10ppm sulphur specification is lower than may be required for many vehicle after treatment systems. In the USA legislation has settled on a maximum of 30ppm for petrol and 15ppm for diesel. Therefore, from an environmental perspective running tight to the maximum sulphur specification for sulphur-free fuels should not be construed as an indication of non-compliances.

Diesel

- *Cetane number:* There are strong economic drivers to upgrade lower quality high acid crude oils particularly as North Sea crude runs out. These lower quality crudes yield low cetane diesel that is brought up to specification by the use of cetane improver (2 ethyl hexyl nitrate). The cetane improver content is optimised such that cetane will be tight to specification at many refineries.
- *Density:* At the 845 kg/m^3 limit for this parameter it is unlikely that many refineries will be consistently tight to this specification unless they have medium/high pressure hydrofining. However, the blending of FAME (density approx. 890 kg/m^3) is likely to result in density being tighter to the maximum specification in the future as increasing amounts of biofuels will need to be blended with conventional fuels to achieve European biofuel targets.
- *Distillation 95% recovered*: This can be limiting but not all refineries are tight to this

specification.

- *Polycyclic aromatic hydrocarbons:* The highest European levels are around 8 - 8.5%, which is now tight to the maximum specification of 8%.
- *Sulphur content:* As for petrol there are strong economic and supply reliability reasons for refiners to blend tight to the sulphur specifications.
- *FAME content:* A maximum of 7% FAME content is permissible as regulated by Annex II of Directive 2009/30/EC; however there is also provision in Article 4.1 for Member States to market diesel fuel with FAME content greater than 7%. This has caused concerns amongst vehicle manufacturers as to the quality control of European fuels with regard to FAME.

2.3 Greenhouse gas emissions

From 2011, the amendments in Article 7a of Directive 2009/30/EC introduce a requirement for fuel suppliers to report on the lifecycle greenhouse gas emissions of their fuels and reduce these by up to 10% by 31 December 2020 compared with the fuel baseline standard. This GHG emission reduction is to be achieved through the use of biofuels and alternative fuels with reduced GHG intensity on a well to wheel basis. As a result, the extraction, refining and processing of fuels is also taken into consideration with the aim of encouraging greater movements towards reduced GHG intensity fuel supplies. Directive 2009/30/EC incorporates greater reporting obligations – and these obligations were scheduled to come into force with the 2011 Fuel Quality Monitoring report submissions. However, full reporting on GHG intensity is currently on hold whilst the methodological basis is being finalised – in particular relating to calculation of lifecycle emissions due to biofuels factoring in indirect land use change. These elements are addressed in a new Commission proposal to amend the Fuel Quality Directive posted in October 2012[17].

2.4 Temporal trends

Temporal trends are depicted in the individual Member State chapters in the form of either stacked area or line charts. This will include temporal trends of:

- Sales of fuels per Member State since reporting began

In future years, with the submission of GHG Reporting, the EU Summary report will begin to build a picture of the EU wide trends over time of GHG intensity.

2.5 Statistical Analysis

In addition to the assessment of Member States compliance with fuel quality limit values, each Member State report chapter features a section that outlines fuel quality performance within the national territory. Additional analysis and interpretation is made of the following parameters for petrol and diesel:

Petrol:

- RON (Research Octane Number)
- MON (Motor Octane Number)

[17] COM(2012) 595 final, Proposal for a DIRECTIVE OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL amending Directive 98/70/EC relating to the quality of petrol and diesel fuels and amending Directive 2009/28/EC on the promotion of the use of energy from renewable sources. Available at: http://ec.europa.eu/clima/policies/transport/fuel/docs/com_2012_595_en.pdf

- Vapour Pressure, DVPE which shows limit values for Member States with a low ambient temperature (Arctic) and those who do not have a derogation from the Commission (Normal)

Diesel:

- Density at 15 °C
- Distillation -- 95-%-Point

Member States have been asked for the additional information to carry out more detailed assessment on these parameters from 2010.

2.6 Member State Summaries

A summary has been prepared for each Member State listing the key areas for further improvement. The recommendations cover areas such as non-compliance or uncertainty about compliance, EN14274 sampling requirements, reporting issues and fuel availability. Recommendations are also presented for the current reporting year – and the previous 3 years. Given that the reporting is carried out per calendar year, data collection for the next reporting period will already be well underway by the time the EU Summary report provides key recommendations. Featuring the key recommendations for the past 3 years gives the opportunity to demonstrate that issues identified in earlier years are being addressed by the Member State. Examples of the types of recommendations include:

Key Areas for Improvement (example comments)		
	Monitoring	**Reporting**
2012	• MS is only carrying out sampling at refineries and depots. Samples should be taken from refuelling stations to comply with the Directive.	• No comment
2011	• MS is only carrying out sampling at refineries and depots. Samples should be taken from refuelling stations to comply with the Directive. • MS has not provided an explanation for utilising a National FQMS in place of the European Standard or its statistical equivalence to the standard.	MS is reporting using an old reporting format, which results in missing information.
2010	• MS is not taking sufficient samples to comply with Statistical Model. • MS is only carrying out sampling at refineries and depots. Samples should be taken from refuelling stations to comply with the Directive.	MS is reporting using an old reporting format, which results in missing information (required by Directive amends after the Commission Decision on a common reporting format). MS was X months late in submitting its report.

Key Areas for Improvement (example comments)

Monitoring	Reporting
• MS is sampling at refuelling stations, terminals and refineries, however it is not clear what proportion has been taken from refuelling stations, therefore it is difficult to determine compliance according to sample numbers. • MS has not provided an explanation for utilising a National FQMS in place of the European Standard or its statistical equivalence to the standard.	MS reported a significant number of non-compliances with limit values MS is not/only partially compliant with reporting requirements, for example: The MS did not sample/report all of the required reporting parameters (18 for petrol, 5 for diesel)

3 EU Summary

Key Messages

Key Messages

- Member States continue to utilise diverse monitoring systems; 5 have opted to use EN 14274 statistical model A (Austria, Finland, Greece, Italy and Spain), 5 have used EN 14274 statistical model B (France, Germany, Poland, Bulgaria and Romania) and 9 have opted for EN 14274 statistical model C (Ireland, Portugal, Cyprus, Czech Republic, Estonia, Hungary, Lithuania, Slovakia and Slovenia). The remaining 8 Member States have used a national monitoring system.
- Fuel sales in the EU in 2012 were heavily weighted toward diesel with over 242,830 million litres of diesel fuel sales compared to 109,331 million litres of combined petrol grade fuel sales.
- The only exceptions to this balance of fuel sales were Greece and Cyprus who both reported higher petrol fuel sales than diesel.
- Germany, France, the UK and Italy (respectively) had the highest volume of fuel sales in 2012 with 18.5%, 14.2%, 12.4% and 10.6% of the share of EU fuel sales.
- Countries classified as 'Large' under the EN 14274 definition of fuel sales (whereby more than 15 million litres of automotive road fuel is dispensed per annum) in 2012 are; France, Italy, Germany, Spain, Poland and the UK. However Poland reported as a 'Small' country.
- Cyprus and Malta reported 1 million tonnes or less of automotive road fuel sales.
- Fuel sales were the least in Bulgaria, Cyprus, Estonia, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Slovakia and Slovenia who represent individually less than 1% of total EU fuel sales.
- The level of detail from Member States is improving, which is in turn leading to greater comparison of data.
- The increased level of detail within Member State reports can be seen within temporal trends as non-compliance appears to increase over time. How much this is due to more accurate reporting, or sampling at higher quantities is difficult to determine.
- Sampling patterns will also be affected by increases/ reductions to the number of fuel grades available on the EU market.
- The average sulphur content EU-wide in 2012 for fuels remained below the limit of 10ppm mandated from 1st January 2009 with average sulphur content of 5.7 ppm (Petrol) and 7.4 ppm (diesel).
- In general, of the 11,365 samples tested for petrol in 2012, 2.8% were found to be non-compliant (1.9% if weighted by fuel sales). Of the 15,039 samples tested for the 6 mandatory parameters for diesel in 2012, 1.6% of all samples were out of specification with Directive limits (2.0% if weighted by fuel sales).

3.1 Fuel Availability 2012

3.1.1 Sales

As can be seen in Figure 3-1 and

Table 3-1, very small amounts of RON 91 were still available on the market in 2012 with sales of only 456 million litres. RON 98 totalled 4,419 million litres, RON 95=<RON<98 totalled to 14,622 million litres, whilst RON 95 represented the majority of petrol fuel sales with 89,833 million litres. Temporal trends in fuel sales and the adoption rates of the differing fuel types have been discussed separately in Chapter 3.3 of the summary report. In diesel, the B7 grade represented the majority of sales with 219,769 million litres sold (90%). B5 diesel, B+ diesel and diesel sold as total of 23,061 (2,720, 137 and 20,204 million litres respectively).

Figure 3-1: EU Fuel Sales volumes by fuel type

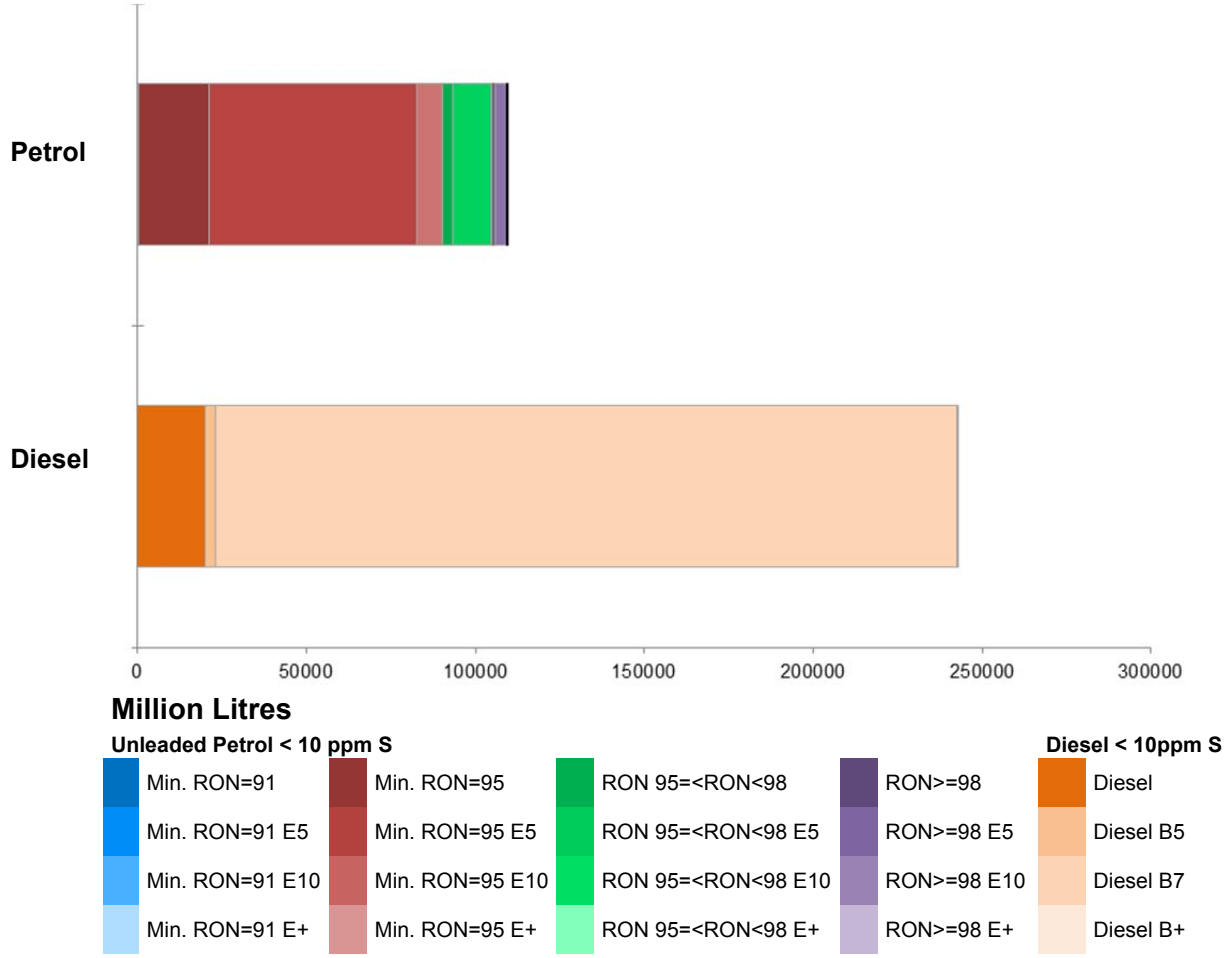


Table 3-1: 2010 EU Summary by fuel type

Fuel Grade	Million Litres	EU market share
Unleaded min. RON=91	456	0.42%
Unleaded min. RON=95	89,833	82.17%
Unleaded 95=<RON<98	14,622	13.37%
Unleaded min. RON 98	4,419	4.04%
Total Petrol	**109,331**	**100.0%**
Diesel (<10 ppm S)	245,227	100.0%
Total Diesel	**242,830**	**100.0%**

Table 3-2 gives fuel sales for each Member State according to fuel type in 2012 (as classified by the Member State).

Table 3-2: 2010 EU27 Fuel Sales by type

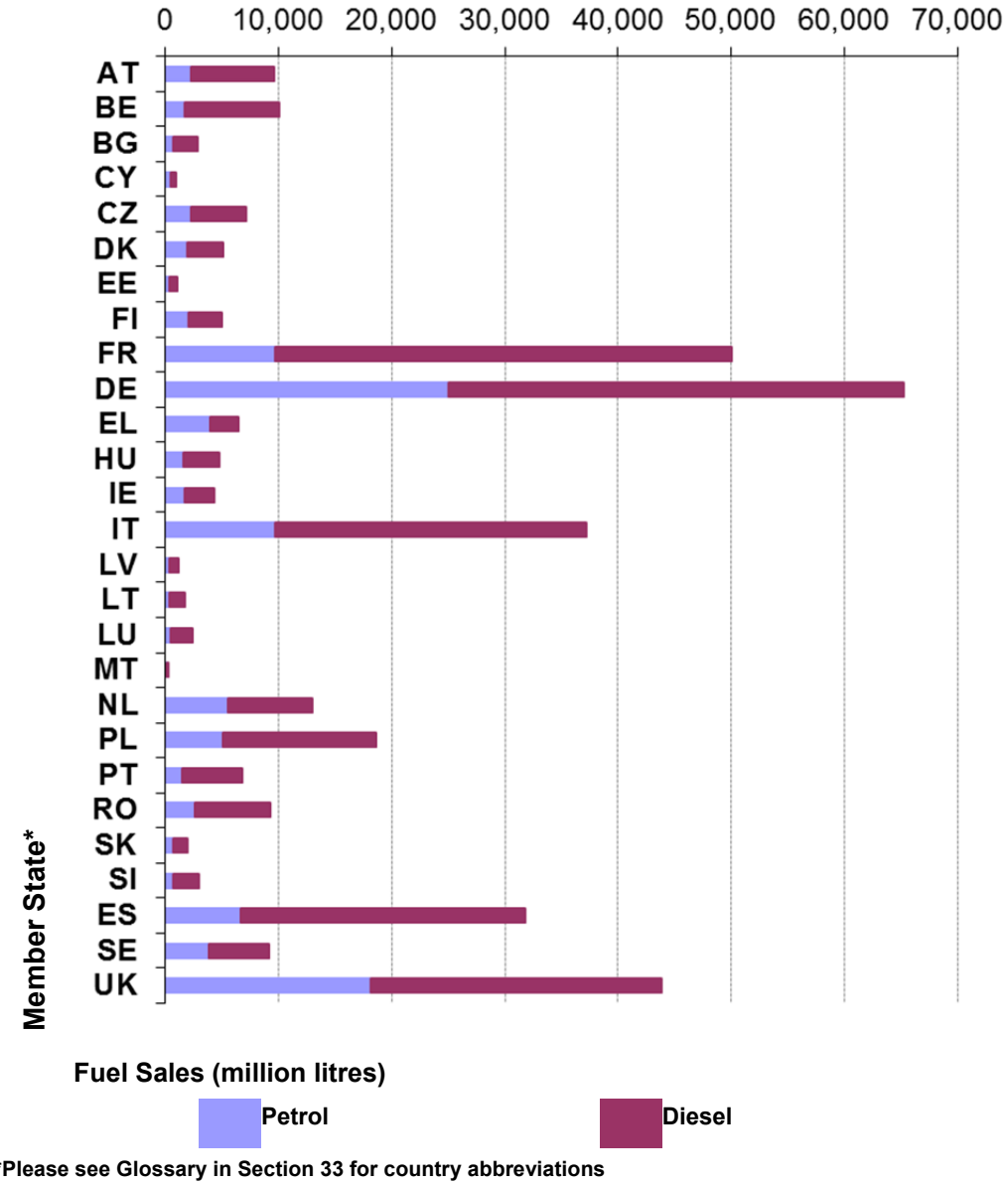
Fuel Type	Petrol Sales (million litres)			Diesel Sales (million litres)		
Member State	**min. RON=91**	**min. RON=95**	**95=<RON<98 min. RON=98**	**RON ≥98**	**Total Petrol**	**Total Diesel**
Austria	41	-	2,215	49	2,305	7,294
Belgium	-	1,385	-	297	1,682	8,317
Bulgaria	-	691	-	36	727	2,049
Cyprus	-	-	471	31	502	365
Czech Republic	16	2,195	62	-	2,273	4,865
Denmark	349	1,531	2	-	1,882	3,205
Estonia	-	-	312	28	341	719
Finland	-	1,144	-	948	2,092	2,843
France	-	9,666	-	-	9,666	40,378
Germany	50	23,479	-	1,502	25,031	40,232
Greece	-	3,831	52	102	3,985	2,506
Hungary	-	1,541	-	42	1,584	3,121
Ireland	-	1,684	-	-	1,684	2,630
Italy	-	9,750	-	-	9,750	27,445
Latvia	-	274	21	-	295	852
Lithuania	-	300	-	7	307	1,342
Luxembourg	-	347	-	77	423	2,001
Malta	-	-	98	-	98	119
Netherlands	-	5,436	59	-	5,495	7,512
Poland	-	4,690	-	412	5,102	13,555
Portugal	-	-	1,403	110	1,513	5,268
Romania	-	-	2,418	205	2,623	6,602
Slovakia	-	649	-	7	656	1,227
Slovenia	-	-	607	78	686	2,270
Spain	-	-	6,170	487	6,658	25,111
Sweden	-	3,738	125	-	3,863	5,273
UK	-	17,501	607	-	18,109	25,728

Figure 3-2 shows the proportion of fuel sales per Member State by fuel type (segregated by fuel type; petrol and diesel). Some general trends within the community can be noted;

- Diesel dominates the market in all but two of the 27 represented Member States with petrol fuels representing 61.4% share of Greek fuel sales and 57.9% of Cypriot fuel sales.

- Belgium, on the other hand, demonstrates the heaviest dependence on diesel fuel with diesel dominating Belgian fuel sales with 83.2% share of the market – the highest proportion of all the Member States.
- The greatest volume of fuel sales in 2012 took place in Germany, with 18.5% total EU fuel sales; the petrol:diesel sales ratio was 38.4%:61.6%. The next biggest market was France with a 14.2% share of EU petrol and diesel fuel sales; their petrol:diesel sales ratio was19.3%:80.7%. UK fuel sales totalled 12.4% of all fuel sales with a ratio of 41.3%:58.7% for petrol:diesel.
- In most countries the tax rate for diesel is lower than for petrol (sometimes significantly), this coupled with the higher efficiency of diesel vehicles (vs petrol equivalents) and improvements to diesel cars has been a key driver in the shift to increasing diesel use in the EU. In the UK the duty rates for petrol and diesel per litre or fuel are the same, which partly explains the lower relative share of the fuel compared to other EU countries due to lower fuel cost savings for cars.

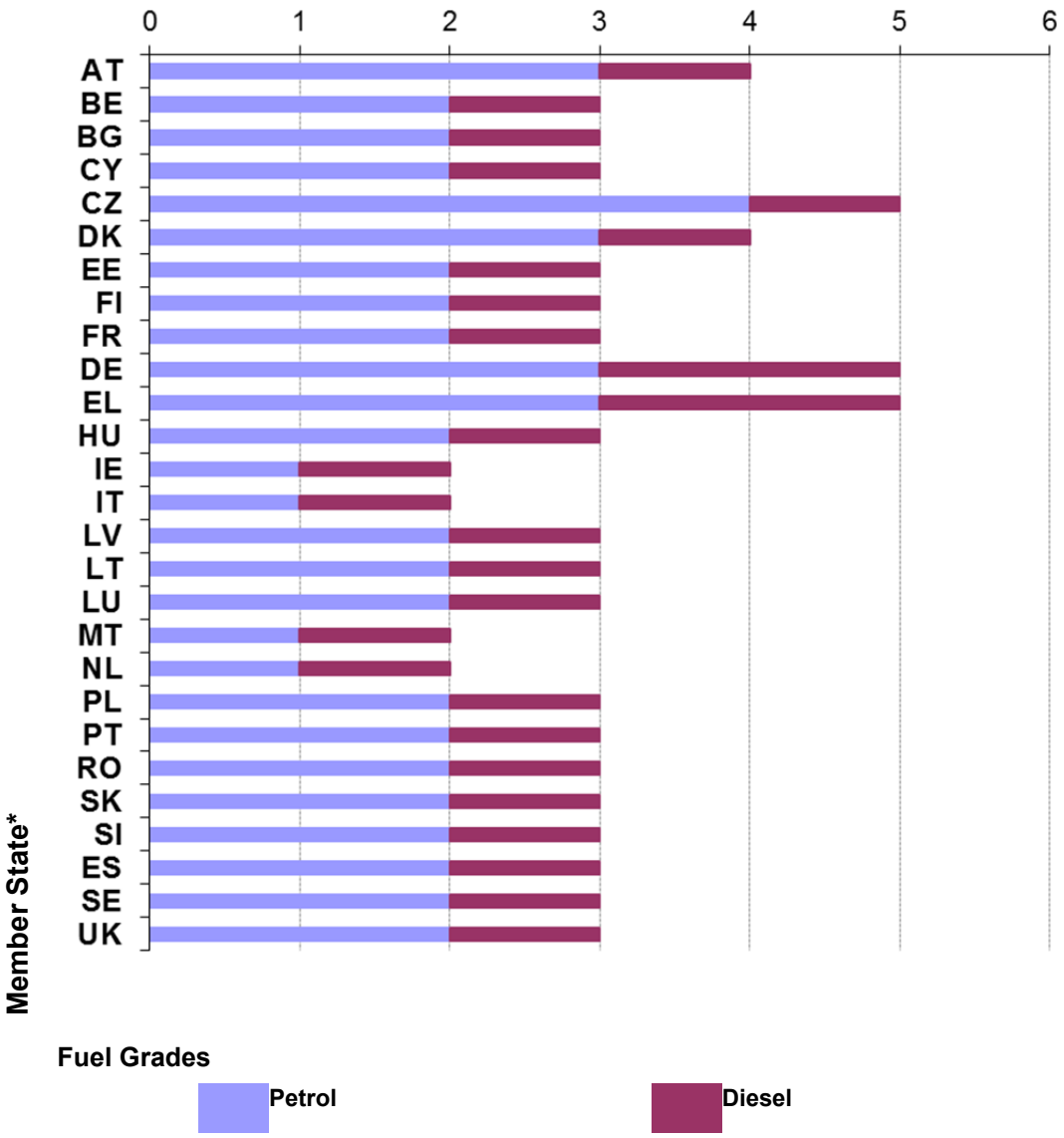
Figure 3-2: National fuel sales by fuel type across the EU (million litres)



*Please see Glossary in Section 33 for country abbreviations

Figure 3-3 provides details of the number of fuel grades available within Member States territories. In 2012, there is a significant increase in the number of fuel grades on the market, with the introduction of fuels with variable ethanol/FAME content.

Figure 3-3: Number of Fuel Grades per Member State



*Please see Glossary in Section 33 for country abbreviations

3.2 Fuel Quality Monitoring 2012

3.2.1 Description of systems

A number of different approaches have been used to implement Fuel Quality Monitoring Systems (FQMS) across the EU, with consistency between Member States methods improving slightly year on year. Approaches range from those based on European Standard EN 14274[18] that sample at a range of fuel retail stations through to national systems, where varying approaches are adopted.

Alternative monitoring systems may be permitted by the Directive, provided such systems ensure the results are of an equivalent confidence (although the criteria for assessing this are not specified). It is therefore not clear whether the existing systems not based on EN 14274 meet this criterion. In 2012, the majority of Member States have provided additional information about their selection of monitoring system (if using a statistical model from EN 14274) or have provided information about the selection of a National monitoring system.

Of the 27 Member State Fuel Quality Monitoring Systems used in 2012;

- 5 have opted to use EN 14274 statistical model A (Austria, Finland, Greece, Italy and Spain)
- 5 have used EN 14274 statistical model B (France, Germany, Poland, Bulgaria and Romania)
- 9 have opted for EN 14274 statistical model C (Ireland, Portugal, Cyprus, Czech Republic, Estonia, Hungary, Lithuania, Slovakia and Slovenia) and;
- The remaining 8 have used a National monitoring system (see Table 3-3)

Model A is the monitoring approach generally recommended in EN 14274 as it groups territories into macro regions with similar sales volumes and fuel supply sources. This approach requires fewer samples as it's designed to account for geographical and supply variability within the country. Model B similarly divides the National territory into regions, however this is when there is no way to make divisions using sales or supply patterns and so existing administrative boundaries may be used to collect monitoring information. Model C should only be considered where the Member State is very small and it can be demonstrated that the country cannot be effectively divided into separate sales/supply regions – and does not have distinct administrative or governing regions. As demonstrated in Table 3-3, some Member States have opted to use statistical model C when there may be a very good case for them to use Model B or even A.

With regards to regional information on sampling, provision has been made within the reporting templates for Member States to provide a regional breakdown of fuel sales and sampling. This is required for countries using models A, B or an equivalent National model that has determined regional divisions. The Netherlands, Romania and Sweden have not provided statistical data to support the EU wide analysis.

3.2.2 Sampling and reporting

There are detailed requirements in EN 14274 on the number and location of samples to be taken and reported in Member States fuel quality reports. EN 14274 lists a number of useful factors to take into account when assessing the sampling regime; such as the number of refineries supplying the market, the number of fuel grades available and the number of different imported fuel grades and sources. The standard specifies minimum number of samples per fuel grade (in each of the winter and summer periods), as discussed in the

[18] EN 14274:2003 - Automotive fuels - Assessment of petrol and diesel quality - Fuel Quality Monitoring System (FQMS).

introductory section. In previous years, there was some uncertainty from Member States about the sampling requirements – however sample quantities and the division of reporting between summer and winter periods have improved in recent years.

Table 3-3 provides a breakdown of individual Member States sampling and reporting in 2012. The total minimum samples required is calculated where the Member State has used a statistical model as outlined in EN 14274 such that the minimum sample requirement is known for each model (A, B and C). The table also provides a breakdown of the total sample numbers taken and the sampling carried out at service stations. All Member States provided this breakdown in 2012. The European Standard EN 14274 specifies that the minimum sampling requirement should be taken from fuel dispensing sites – which are defined as a "*site, retail or commercial where fuel is dispensed into road vehicles for propulsion.*" Therefore any sampling taken at distribution terminals or refineries should be taken in addition to those from service stations in order to meet minimum sampling requirements.

Where Member States have reported using a National system, an assessment has been made of the equivalent minimum sample requirements on the basis of the size of the country, and other details provided. Where the location of samples is known, it is possible to determine whether sample quantities demonstrate compliance with EN 14274. Belgium has reported as a small country (less than 15 million tonnes of fuel sales) and has not reported results broken down by sub-regions. Therefore the minimum number of samples; to ensure the Belgium monitoring system sample quantities are equivalent to the specifications outlined in EN 14274, will be 100 samples per fuel grade for full year. Reporting two separate petrol fuel grades in 2012 and one diesel fuel grade, Belgium has also taken all samples from service stations with 2,239 petrol fuel samples and 6,036 diesel fuel samples taken, Belgium clearly demonstrates compliance with the minimum number of samples required to achieve equivalence to EN 14274 requirements.

Denmark have also reported 2012 fuel quality monitoring using a National Model and with fuel sales of less than 15 million tonnes and no sub-regional breakdown of reporting, is also required to take 100 samples per fuel grade for full year. In contrast to Belgium, Denmark has reported a fuel type (petrol RON 98) that represents a market share of national fuel sales of less than 10%. Subsequently, to meet equivalence with EN 14274 minimum sampling requirements, fewer samples are required. Using the calculation methodology laid out in EN 14274, less than one sample is actually required for petrol RON 98 to meet equivalence with the international standard, and this has been achieved. However, Denmark have reported only 43 petrol samples in total, against an equivalence requirement of 202 and only 21 diesel samples against an equivalence requirement of 100. Therefore the Danish FQMS is not compliant with the Directive as the national monitoring system does not demonstrate equivalence with EN 14274.

As a small country, Malta has also reported a small number of fuel samples using a National Monitoring System. With one petrol fuel grade and one diesel fuel grade and no sub-regions, Malta would be expected to report a minimum of 100 petrol samples and 100 diesel samples in total. In 2012, Malta sampled and reported only 36 petrol samples in total and only 37 diesel samples.

Luxembourg has also reported 2012 fuel quality monitoring using a National Model and with fuel sales of less than 15 million tonnes and with no sub-regional breakdown of reporting, is also required to take 100 samples per fuel grade for full year. Reporting two separate petrol fuel grades in 2012 and one diesel fuel grade, Luxembourg has taken samples from service stations and terminals. With only a combined total of 80 petrol samples and 82 diesel samples, Luxembourg's FQMS is not compliant with the Directive as the national monitoring system does not demonstrate equivalence with EN 14274.

Sweden, the Netherlands and Latvia have also reported 2012 fuel quality monitoring using a National Model and with fuel sales of less than 15 million tonnes and no sub-regional breakdown of reporting, are also required to take 100 samples per fuel grade for full year.

Also in contrast to Belgium, Sweden, the Netherlands and Latvia have all reported a fuel type that represents a market share of national fuel sales of less than 10%. Subsequently, to meet equivalence with EN 14274 minimum sampling requirements, fewer samples are required. Using the calculation methodology laid out in EN 14274, Sweden, the Netherlands and Latvia are compliant with the Directive as the national monitoring system does demonstrate equivalence with EN 14274.

There is also some uncertainly regarding the sample quantities required from fuels with a market share of less than 10%. European Standard EN 14274 suggests that this should be determined by dividing the proportion of market share of the fuel with a share of less than 10% by the share of the parent fuel grade and then multiplying it by the number of samples required for the parent fuel grade. In most cases sample quantities taken by the Member State for fuels with a share of less than 10% exceed the minimum requirement.

A further complication in determining how many samples are required for a given fuel grade is that, at the time a Member State must decide how many samples to take, they do not know fuel sales for the year in question. Member States commonly tender contracts for fuel quality monitoring several years in advance that last a number of years, and they may need to decide when tendering how many samples of each grade should be taken. This may lead to uncertainty about whether a Member State's monitoring regime will comply with EN 14274 in future years.

As an example, in 2005 Poland sold 13,647 million litres of automotive fuel, meaning that it classified as a 'small' country under EN 14274. In 2006, 15,350 million litres of automotive fuel were sold in Poland, meaning it classified as a 'large country under EN 14274. This meant that in 2006 Poland would have been required to take more samples than in 2005, as the sampling requirements for 'large' countries are greater than for 'small' ones. However, Poland could not know in advance the quantity of fuel that would be sold in its territory, so might not have put the required monitoring system in place.

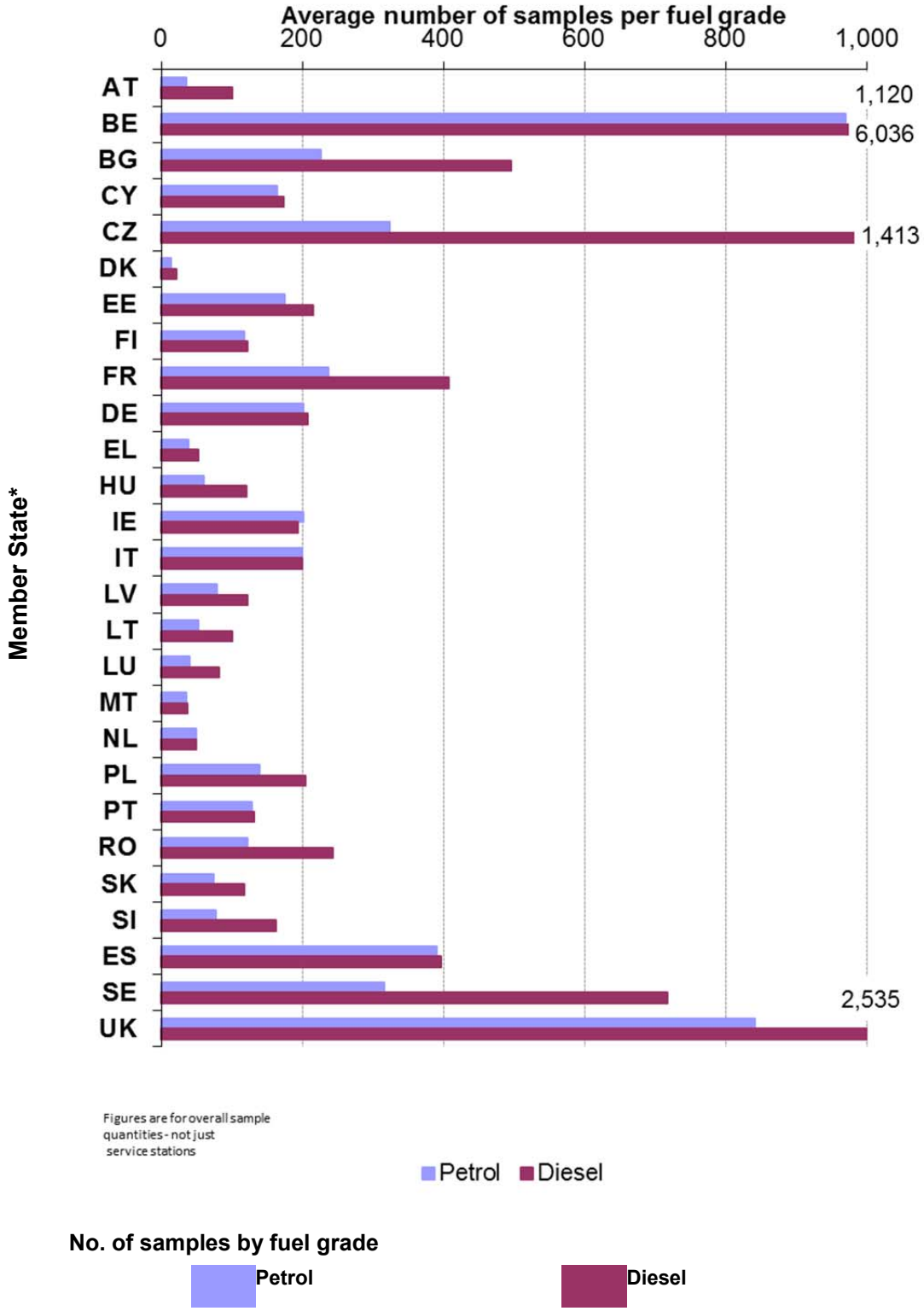
The same issue applies to fuels whose sales represent less than 10% of the market. In this instance, EN 14274 uses a formula based on sales volume relative to the parent fuel grade to determine the number of samples required. However, Member States do not know in advance whether a fuel will comprise less than 10% of the market or not, and do not have the relevant sales data to decide sampling frequency in advance. In some cases, it is not even possible to use historical data to determine how many samples to take, as some fuel grades (e.g. grades with varying amounts of ethanol of FAME) were not monitored in 2011. This makes it difficult to know if Member States are complying with the Directive or not.

Table 3-3: Summary of Member State sampling and reporting in relation to the requirements of Directive 98/70/EC and of European Standard EN 14274

MS		FQMS Model (1)	Size (2)	Separate S&W? (3)	Samples per grade per period (4)	Total samples required (5)		Samples Taken (6)		Samples Taken at Service Stations (7)		Sampling Compliance (8)	
						Pet	Dsl	Pet	Dsl	Pet	Dsl	Pet	Dsl
Austria	AT	A	S	✓	50	106	100	106	100	106	100	✓	✓
Belgium	BE	N	S	✓	(50)	(200)	(100)	2239	6036	2239	6036	(✓)	(✓)
Bulgaria	BG	B	S	✓	100	212	204	453	496	428	473	✓	✓
Cyprus	CY	C	S	✓	50	108	100	328	173	328	173	✓	✓
Czech Republic	CZ	C	S	✓	50	106	104	1294	1468	1294	1468	✓	✓
Denmark	DK	N	S	✓	(50)	(202)	(100)	43	21	43	21	(×)	(×)
Estonia	EE	C	S	✓	50	110	100	350	215	350	210	✓	✓
Finland	FI	A	S	✓	50	200	100	235	122	235	122	✓	✓
France	FR	B	L	✓	200	800	400	473	408	473	408	×	✓
Germany	DE	B	L	✓	200	826	400	602	415	602	415	×	✓
Greece	EL	A	S	✓	50	106	102	116	106	73	53	×	×
Hungary	HU	C	S	✓	50	104	100	120	120	120	120	✓	✓
Ireland	IE	C	S	✓	50	100	100	201	194	160	161	✓	✓
Italy	IT	A	L	✓	100	200	200	200	200	200	200	✓	✓
Latvia	LV	N	S	✓	(50)	(112)	(200)	158	244	119	126	(✓)	(✓)
Lithuania	LT	C	S	✓	50	104	100	106	100	92	89	×	×
Luxem-bourg	LU	N	S	✓	(50)	(200)	(100)	80	82	80	82	(×)	(×)
Malta	MT	N	S	✓	(50)	(100)	(100)	36	37	27	27	(×)	(×)
Nether-lands	NL	N	S	✓	(50)	(100)	(100)	50	50	50	50	(×)	(×)
Poland	PL	B	S	✓	200	434	400	279	204	279	204	×	×
Portugal	PT	C	S	✓	50	108	100	200	100	200	100	✓	✓
Romania	RO	B	S	✓	100	208	200	244	243	221	223	✓	✓
Slovakia	SK	C	S	✓	50	102	100	149	118	149	118	✓	✓
Slovenia	SI	C	S	✓	50	200	100	154	162	154	162	×	✓
Spain	ES	A	L	✓	100	230	200	780	396	0	0	×	×
Sweden	SE	N	S	✓	(50)	(104)	(100)	631	717	0	0	(×)	(×)
UK	UK	N	L	✓	(100)	(208)	(200)	1682	2535	437	263	(✓)	(✓)

#	Column	Explanatory notes
(1)	FQMS Model	N = National Fuel Quality Monitoring System (FQMS) A = EN 14274 Statistical Model A B = EN 14274 Statistical Model B C = EN 14274 Statistical Model C
(2)	Size – Country size	S = Small (total automotive road fuel sales < 15 million tonnes pa) L = Large (total automotive road fuel sales > 15 million tonnes pa)
(3)	Separate S & W?	✓ Separate summer & winter reporting × indicates full year sample results reporting only.
(4)	Samples per grade per period	EN 14274: There are reduced sampling requirements for grades comprising of less than 10% total sale. For Member States using a national FQMS, estimated equivalent minimum samples (based on fuel sales) are shown in brackets ().
(5)	Total samples required	Calculation of the EN 14274 minimum sample total required according to FQM model and country size. The minimum sample requirement is to be taken from the 'point of use' at fuel dispensing sites. For Member States using a national FQMS, estimated equivalent minimum samples (based on fuel sales) are shown in brackets ().
(6)	Samples Taken	The total number of samples taken per fuel type at all locations (service stations, terminals and refineries).
(7)	Samples taken at Service Stations	The total number of samples taken at service stations; fuel dispensing sites (public and commercial). This is reported separately in the standard reporting template; where samples taken at service stations do not match overall samples taken, this is due to differences in the original report submission.
(8)	Sampling Compliance	✓ indicates compliance with EN 14274 Sampling Number requirement and × indicates non-compliance. Note that this indicates overall sampling compliance across all fuel grades; see Member State report for sampling compliance for each fuel grade individually. Where a national FQM system is used, estimated compliance to demonstrate equivalence with EN14274 is shown in brackets (). Where Member States have not provided a breakdown of sampling location, it is not possible to assess sampling compliance.
	Pet.	Petrol
	Dsl	Diesel

Figure 3-4: 2012 Sampling rate across the EU (average number of samples per fuel grade)

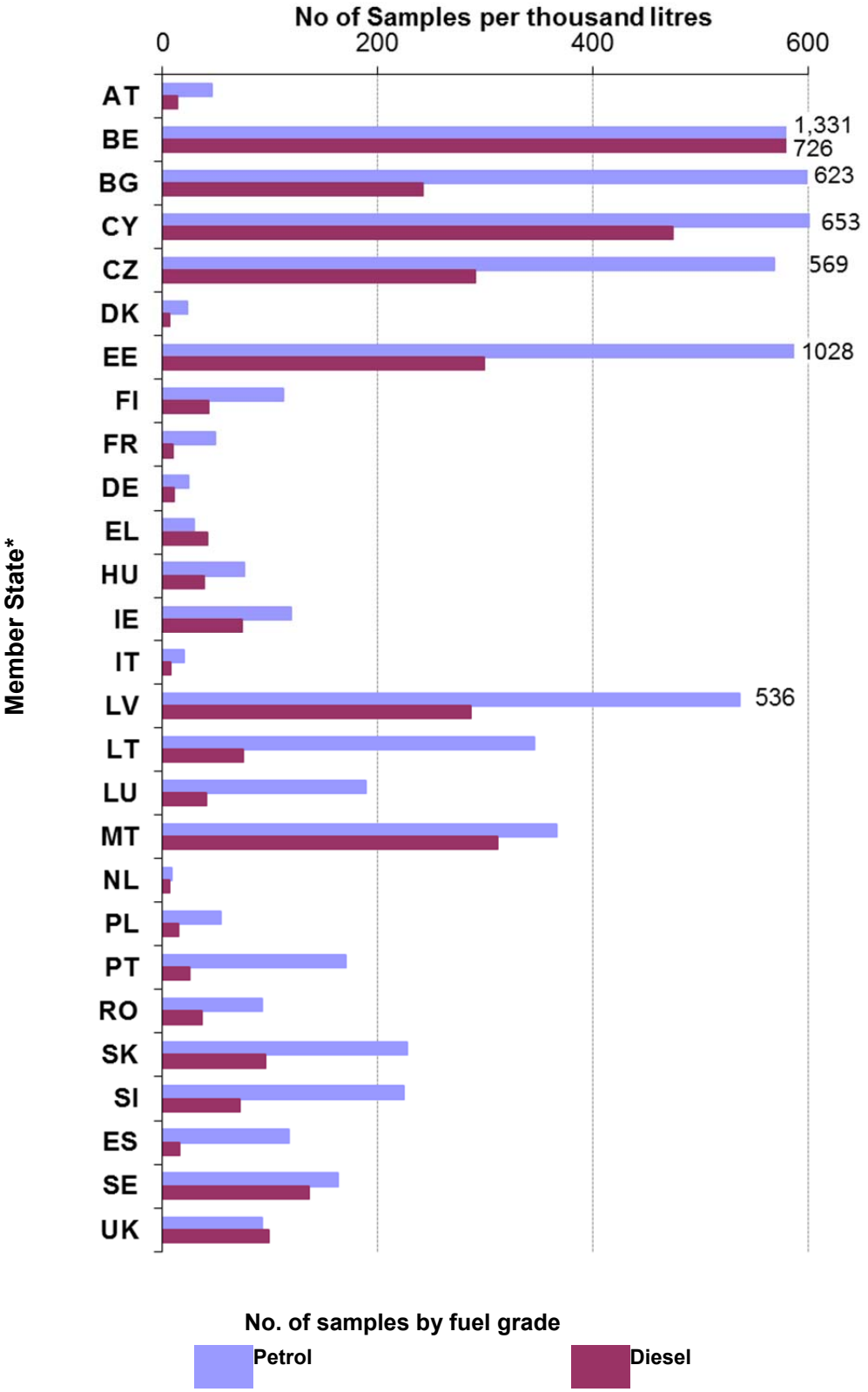


***Sampling taken from all locations (includes terminal/ refinery sampling)**

***Please see Glossary in Section 33 for country abbreviations**

***Scale adjusted to show full detail. For countries where samples per fuel grade is greater than 1,000 (BE), CZ and UK, bars are truncated and values are indicated at the end of the bar.**

Figure 3-5: No. of fuel samples per thousand litres



*Sampling taken from all locations (includes terminal/ refinery sampling)

*Please see Glossary in Section 33 for country abbreviations

*Scale adjusted to show full detail. For countries where samples per thousand litres is greater than 600 (BE, EE and LV), bars are truncated and values are indicated at the end of the bar.

3.2.3 Compliance with 98/70/EC Limit Values

3.2.3.1 Petrol reporting

In 2012, all Member States provided full information about petrol sample compliance. In order to determine compliance, it is necessary to know which test method has been used to test for some parameters (because reproducibility and tolerance levels differ according to test method). Provision has been made for Member States to give this information within the reporting template – although this is not a mandatory part of the reporting it is vital to determine compliance levels. The symbol '>' also indicates where details about the number of non-compliant samples have not been provided by Member States and so the figure presented is a minimum with the actual value potentially larger. This is when Member States have not confirmed exactly how many samples were found to be out of specification with tolerance limits – yet have reported a minimum or maximum sample value that exceed tolerance limits.

The parameters found to be out of specification most frequently within the Community in 2012 were:

- Summer Vapour Pressure was exceeded 175 times in 2012. However, it is becoming apparent that many exceedances are the result of transitional periods; when suppliers swap the summer specification fuel for winter specification fuels and vice versa.
- RON/ MON samples found to be out of specification in 2012 totalled 61 samples within the Community.

Some Member States did not provided full details of samples found to be out of compliance with tolerance limits. Presentation of the temporal trends in compliance with limit values can be found in Section 3.3.3.

3.2.3.2 Diesel reporting

In 2012, some Member States did not provided full details of samples found to be out of compliance with tolerance limits. As with petrol reporting, details of temporal trends in parameter compliance can be found in Section 3.3.3.

Of the 6 parameters required to be tested for diesel in 2012, parameters found to be out of specification were;

- The Sulphur content maximum of 10ppm was exceeded by a total of 144 samples. However the average sulphur content for all Member States remains below the mandatory limit of 10ppm at 7.42 ppm.
- In total, 22 samples tested for distillation limits were found to be out of specification.

3.2.3.3 Overall Summary

Table 3-4 summarises the compliance of Member States with Directive 98/70/EC for the year 2012 reporting in terms of the results of the analysis of samples against Tolerance Limits and the reporting format and content. Amendments to Directive 98/70/EC (Directive 2003/17/EC) included the insertion of a paragraph stating *"Member States shall determine the penalties applicable to breaches of the national provisions adopted pursuant to this Directive. The penalties determined must be effective, proportionate and dissuasive."* Some Member States have provided an explanation of the remedial actions and penalties imposed by national authorities where samples are found to be out of specification. These and other notes pertinent to the Member States monitoring systems have been highlighted in and also given in more detail in the individual Member State chapters of this report.

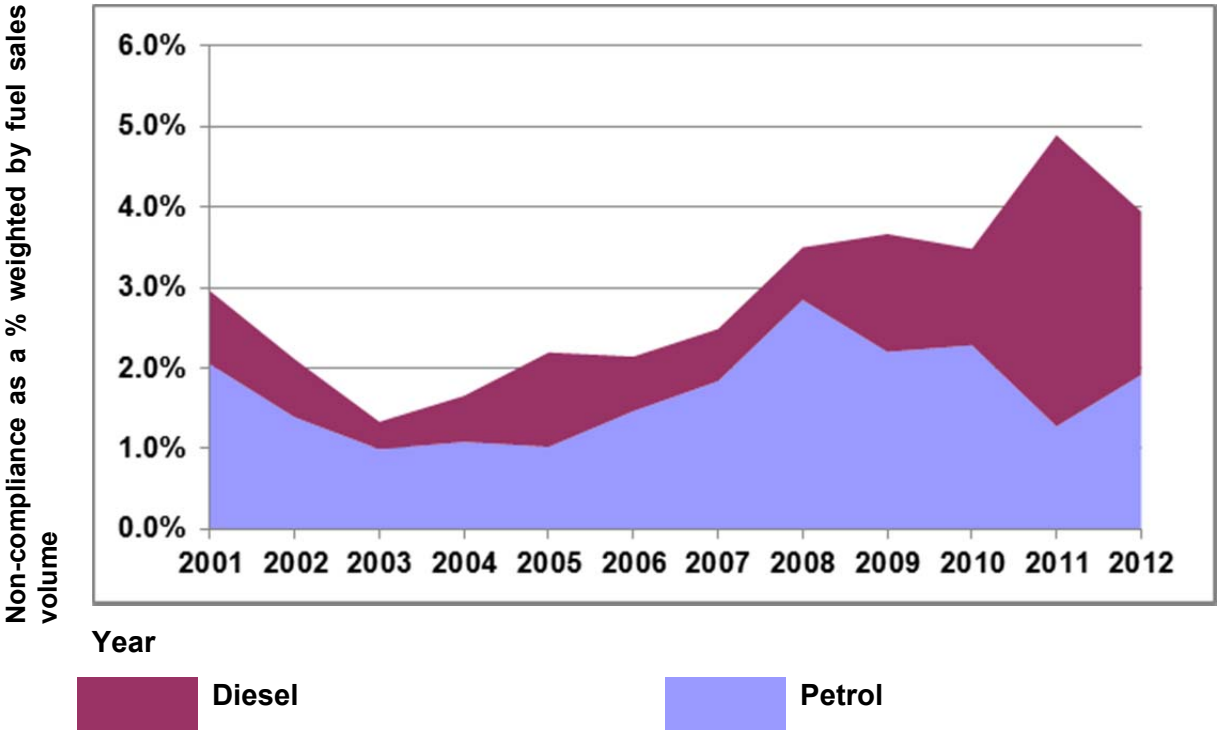
In general, of the 11,365 samples tested for petrol in 2012, 322 were found to be out of specification with tolerance limits for one or more parameter, which represents a non-compliance rate of 2.8%. Of the 15,039 samples tested for the 6 mandatory parameters for

diesel in 2012, 237 were found to be non-compliant with specified limits, representing 1.6% of all samples reported.

The proportion of samples found to be out of specification is reliant on the number of samples taken, which should be dependent (within each Member State) on the fuel sales volume, and supply sources. However, with Member States using National systems that may not demonstrate equivalence with Statistical models A, B or C and using statistical models that may not be the most suitable, it is necessary to also consider non-compliances within the Community weighted by volume and by sample numbers.

Figure 3-6 gives the rate of non-compliances weighted according to sales volume and sample numbers and shows an upward trend to 2012. A full discussion of temporal trends in compliance is provided in Section 3.3.3.

Figure 3-6: Temporal trends in total limit value non-compliances for petrol and diesel fuels



*** Excludes France in 2003 - 2005, as no submissions were provided. Excludes Luxembourg in 2007 to 2009 and Malta in 2006 and 2009 as no reports were provided. In addition, the EU expanded in 2004, 2007 from 15 to 27 Member States.**

Table 3-4: Summary of Member State compliance with 98/70/EC for 2012 reporting.

MS	Non-compliance with limit values non-compliant samples (NC) / total samples (1)				Incomplete reporting parameters not measured (NM) / total (2)				Late report (3)
	Petrol NC	Total	Diesel NC	Total	Petrol NM	Total	Diesel NM	Total	(months)
AT	2	106	1	100	0	19	0	6	On time
BE	104	2239	102	6036	0	19	0	6	On time
BG	9	453	32	496	1	19	0	6	On time
CY	29	328	0	173	2	19	0	6	On time
CZ	21	1293	21	1413	0	19	0	6	On time
DK	0	43	0	21	0	19	0	6	On time
EE	8	350	2	215	1	19	0	6	< 1 month
FI	18	235	1	122	1	19	1	6	On time
FR	16	473	28	408	0	19	0	6	< 1 month
DE	5	602	1	415	0	19	0	6	<2 months
EL	0	116	0	106	6	19	0	6	On time
HU	5	120	0	120	0	19	0	6	On time
IE	10	201	4	194	0	19	0	6	On time
IT	6	200	3	200	4	19	0	6	< 1 month
LV	0	158	0	244	0	19	0	6	< 1 month
LT	0	106	0	100	0	19	0	6	On time
LU	8	80	0	82	0	19	0	6	On time
MT	4	36	8	37	0	19	0	6	On time
NL	0	50	>1	50	2	19	0	6	< 1 month
PL	12	279	7	204	1	19	0	6	On time
PT	33	257	4	132	1	19	0	6	On time
RO	6	244	6	243	1	19	0	6	< 1 month
SK	8	149	8	118	0	19	0	6	On time
SI	4	154	4	162	1	19	0	6	On time
ES	0	780	0	396	0	19	0	6	<2 months
SE	0	631	0	717	6	19	1	6	On time
UK	14	1682	4	2535	0	19	0	6	On time
No. Countries									27

NS = no submission

#	Column	Explanatory notes
(1)	Non-compliance with limit values (95% confidence limits)	It is not possible to confirm whether limit values have been respected in all samples, where reporting data is incomplete. Where it has not been possible to establish from submissions the number of samples exceeding the limit value a '>' symbol indicates that the number of samples exceeding limits is a minimum and might be greater.

(2)	Incomplete reporting	Some parameters may be sampled in smaller quantities, however all parameters should be sampled to accurately assess fuel quality. Member States should make it clear when sample results have been obtained and provide sample results.
(3)	Late report	Directive 98/70/EC states that Member States should submit monitoring reports by no later than 30 June each year

Table 3-5: Summary of parameters not reported by Member States for each fuel grade

Member State	Petrol and diesel grades marketed in each Member State in 2012					
Austria	**Unleaded petrol RON=91 E5**	**Unleaded petrol 95=<RON<98 E5**	**Unleaded petrol RON>= 98 E5**	**Diesel B7**		
	All reported	All reported	All reported	All reported		
Belgium	**Unleaded petrol RON=95 E5**	**Unleaded petrol RON>=98 E5**	**Diesel B5**			
	All reported	All reported	All reported			
Bulgaria	**Unleaded petrol RON=95 E5**	**Unleaded petrol RON>=98 E5**	**Diesel**	**Diesel B7**		
	Motor Octane Number	Manganese Motor Octane Number	All reported	Cetane number Density at 15°C Distillation 95% PAH Sulphur content FAME Content		
Cyprus	**Unleaded petrol RON=95**	**Unleaded petrol RON 98**	**Diesel B7**			
	Manganese Iso-butyl alcohol	Manganese Iso-butyl alcohol	All reported			
Czech Republic	**Unleaded petrol RON=91 E5**	**Unleaded petrol RON=95 E5**	**Unleaded petrol 95=<RON<98 E5**	**Unleaded petrol 95=<RON<98 E+**	**Diesel B7**	**Diesel B+**
	All reported	All reported	All reported	Research Octane Number Motor Octane Number Distillation 95% Olefins Aromatics Benzene Oxygen content Iso-propyl alcohol Tert-butyl alcohol Iso-butyl alcohol Lead content Manganese	All reported	PAH
Denmark	**Unleaded petrol RON=91 E5**	**Unleaded petrol RON=95 E5**	**Unleaded petrol 95=< RON<98 E5**	**Diesel B7**		
	All reported	All reported	All reported	All reported		
Estonia	**Unleaded petrol 95=<RON<98 E5**	**Unleaded petrol RON >= 98 E5**	**Diesel B5**			
	Manganese	Manganese	All reported			
Finland	**Unleaded petrol RON=95 E10**	**Unleaded petrol RON>=98 E5**	**Diesel B7**			
	Manganese	Manganese	FAME content			
France	**Unleaded petrol RON=95 E5**	**Unleaded petrol RON=95 E10**	**Diesel B7**			
	All reported	All reported	All reported			
Germany	**Unleaded petrol RON 91 E5**	**Unleaded petrol RON 95-98 E5**	**Unleaded petrol RON 95-98 E10**	**Unleaded petrol RON 98 E5**	**Diesel B5, Diesel B7**	
	None reported	All reported	All reported	All reported	All reported	

Member State	Petrol and diesel grades marketed in each Member State in 2012					
Greece	**Unleaded petrol RON=95**	**Unleaded petrol 95=< RON<98**	**Unleaded petrol RON >= 98**	**Diesel B7**		
	Methanol, Iso-propyl alcohol, Tert-butyl alcohol, Iso-butyl alcohol Other oxygenates Manganese	Methanol, Iso-propyl alcohol, Tert-butyl alcohol, Iso-butyl alcohol Other oxygenates Manganese	Methanol, Iso-propyl alcohol, Tert-butyl alcohol, Iso-butyl alcohol Other oxygenates Manganese	All reported		
Hungary	**Unleaded petrol RON=95 E5**	**Unleaded petrol RON>=98 E5**	**Diesel B7**			
	All reported	All reported	All reported			
Ireland	**Unleaded petrol RON=95**	**Diesel**				
	All reported	All reported				
Italy	**Unleaded petrol RON=95**	**Diesel B7**				
	Iso-propyl alcohol, Tert-butyl alcohol, Iso-butyl alcohol	All reported				
Latvia	**Unleaded petrol RON=95**	**Unleaded petrol RON=95 E5**	**Unleaded petrol RON=95 E+**	**Unleaded petrol 95=<RON<98**	**Diesel**	**Diesel B7**
	None reported	All reported	None reported	All reported	All reported	All reported
Lithuania	**Unleaded petrol RON=95**	**Unleaded petrol RON>=98**	**Diesel**			
	All reported	All reported	All reported			
Luxem-bourg	**Unleaded petrol RON=95 E5**	**Unleaded petrol RON>=98 E5**	**Diesel B5**			
	All reported	Manganese	All reported			
Malta	**Unleaded petrol RON 95-98**	**Diesel**				
	All reported	All reported				
Nether-lands	**Unleaded petrol RON 95**	**Diesel**				
	Vapour Pressure Manganese	All reported				
Poland	**Unleaded petrol RON 95**	**Unleaded petrol RON 98**	**Diesel**			
	Manganese	Manganese	All reported			
Portugal	**Unleaded petrol RON 95-98**	**Unleaded petrol RON 98**	**Diesel B7**			
	Manganese	Manganese	All reported			
Romania	**Unleaded petrol RON 95-98**	**Unleaded petrol RON 98**	**Diesel B7**			
	Manganese	Manganese	All reported			

Member State	Petrol and diesel grades marketed in each Member State in 2012		
Slovakia	**Unleaded petrol RON 95 E10**	**Unleaded petrol RON 98 E10**	**Diesel B7**
	All reported	All reported	All reported
Slovenia	**Unleaded petrol RON 95-98 E5**	**Unleaded petrol RON 98 E5**	**Diesel B5**
	Manganese	Manganese	All reported
Spain	**Unleaded petrol RON 95-98 E5**	**Unleaded petrol RON 98 E5**	**Diesel B7**
	All reported	All reported	All reported
Sweden	**Unleaded petrol RON 95 E5**	**Unleaded petrol RON 95-98 E5**	**Diesel B5**
	Methanol, Ethanol, Iso-propyl alcohol, Tert-butyl alcohol, Iso-butyl alcohol, Other oxygenates	Methanol, Ethanol, Iso-propyl alcohol, Tert-butyl alcohol, Iso-butyl alcohol, Other oxygenates	FAME content
UK	**Unleaded petrol RON 95 E5**	**Unleaded petrol RON 95-98 E5**	**Diesel B7**
	All reported	All reported	All reported

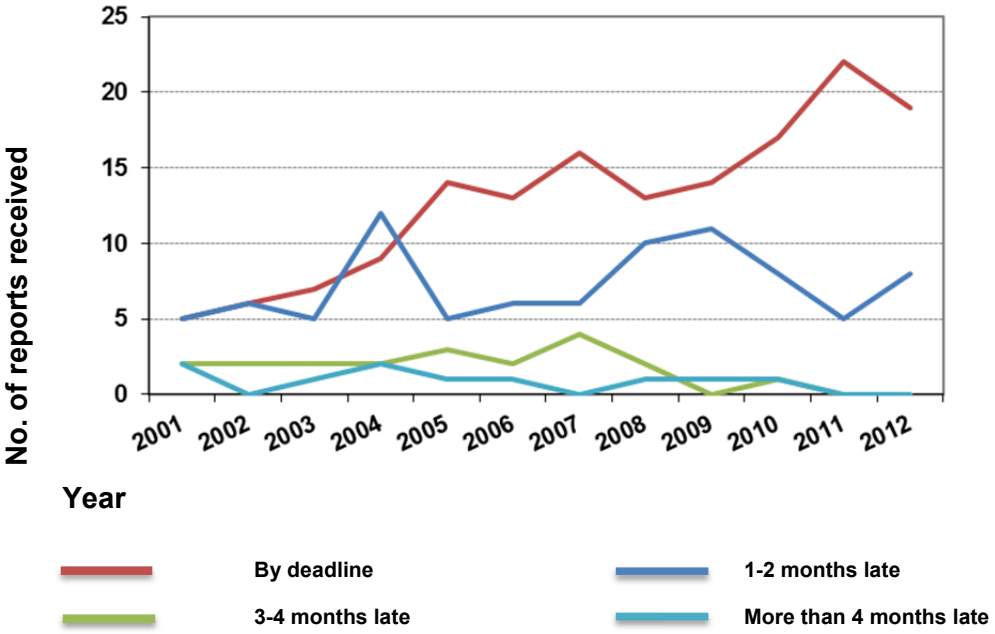
3.3 Temporal Trends

3.3.1 Temporal Trends in Sampling and Reporting

The following figures provide a summary of the temporal trends in sampling and reporting in the European Union. The interpretation of temporal trends, EU-wide is heavily reliant on consistent reporting by Member States on an annual basis.

The majority of reports in 2012 were received by the 30th June deadline or within 2 months after the deadline (see Figure 3-7).

Figure 3-7: Temporal trends in the punctuality of report submissions

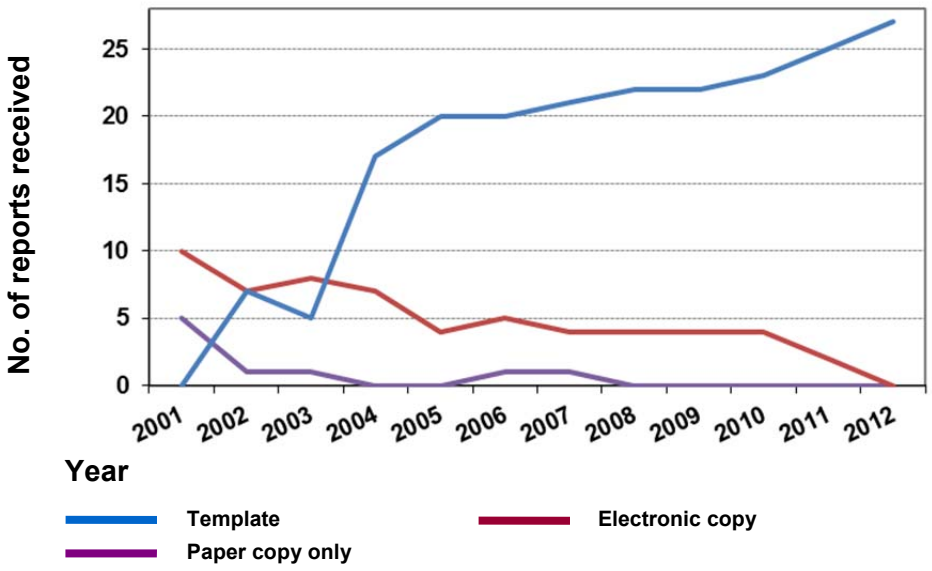


*** Excludes France in 2003 - 2005, as no submissions were provided. Excludes Luxembourg in 2007 to 2009 and Malta in 2006 and 2009 as no reports were provided. The EU expanded in 2004, 2007 from 15 to 27 Member States.**

Figure 3-8 gives the format of the reports received from Member States in 2012. EN 14274 specifies that Member States should submit their report by the reporting deadline of 30th June annually. The submission process is to email a copy of the report to ENV-Report-98-70@ec.europa.eu and also to send a hard copy of the report to the Secretary General.

All of Member States have submitted their reports in the correct manner. Reporting consistency and accuracy is greatly enhanced by using a consistent format for reporting. In addition, the timely and accurate analysis of EU-wide and combined data is assisted with reporting in a consistent format. This enables feedback to the Community about fuel quality for the previous calendar year to be provided as soon as possible.

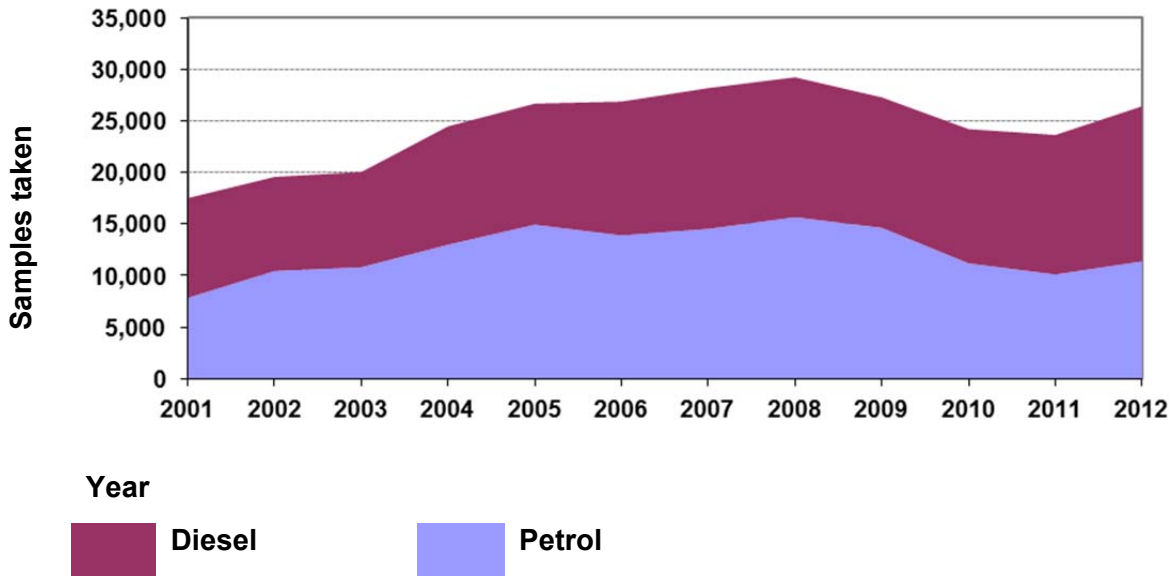
Figure 3-8: Number of Member State reports received on time, by format of submission



***Excludes France in 2003 - 2005, as no submissions were provided. *Excludes Luxembourg in 2007 to 2009 and Malta in 2006 and 2009 as no reports were provided. In addition, the EU expanded in 2004, 2007 from 15 to 27 Member States.**

Figure 3-9 exhibits a slight increase in sampling quantities in 2012 since the previous year. Absolute sample quantity figures are 11,365 samples tested and reported for petrol and 15,039 samples tested and reported for diesel. This weighting corresponds to the higher sales volume of diesel within the Community. Future trends in sampling quantities will depend on availability of fuels with added ethanol content as the new specifications of Directive 2009/30/EC begin to have an impact on sample requirements and increase the number of fuel grades available within parent fuel specifications.

Figure 3-9: Temporal trends in the total number of petrol and diesel samples taken



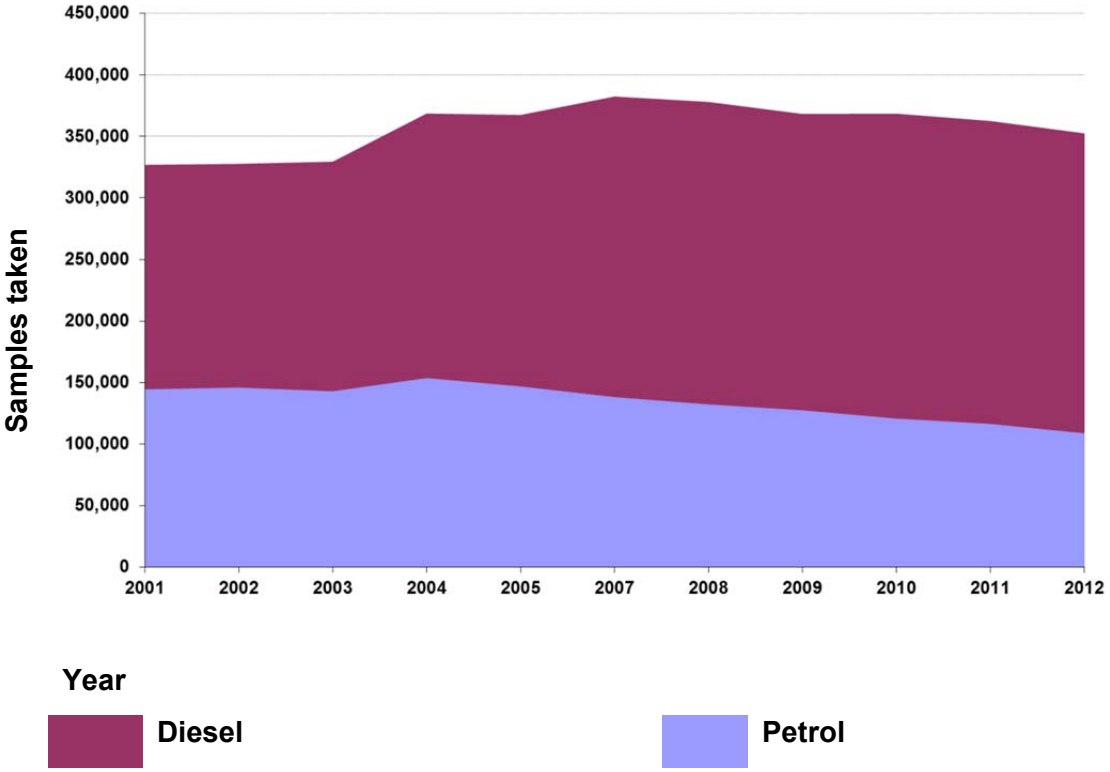
*** Excludes France in 2003 - 2005, as no submissions were provided. Excludes Luxembourg in 2007 to 2009 and Malta in 2006 and 2009 as no reports were provided. In addition, the EU expanded in 2004, 2007 from 15 to 27 Member States.**

3.3.2 Fuel Sales and Sulphur Content

Figure 3-10 gives the temporal trend in fuel sales from 2001 to 2012. Some reports have been missing from the data over the years which generates slight inconsistencies year on year.

Of the 27 Member state reports represented in Figure 3-10, only one country reported an increase in petrol fuel sales and 11 Member States reported an increase in diesel fuel sale in 2012. This is a broadly similar picture to fuel sales in 2011, when only 3 Member States experienced a growth in petrol fuel sales (out of 27) while the remaining 24 reported a decrease in petrol fuel sales on the preceding year. A similar pattern was found for diesel fuel sales when 18 Member States reported an increase in the sold volume of fuel in 2011. However, 20 Member States had the same trajectory (increase or decrease) for petrol fuel sale and 14 Member States had the same pattern (increase or decrease) for diesel fuel sale in both 2011 and 2012. Overall, fuel sales in the EU have decreased by 1.02% between 2011 and 2012.

Figure 3-10: Temporal trends in EU27 Sales of petrol and diesel (million litres)



*** Excludes France in 2003 - 2005, as no submissions were provided. Excludes Luxembourg in 2007 to 2009 and Malta in 2006 and 2009 as no reports were provided. In addition, the EU expanded in 2004, 2007 from 15 to 27 Member States.**

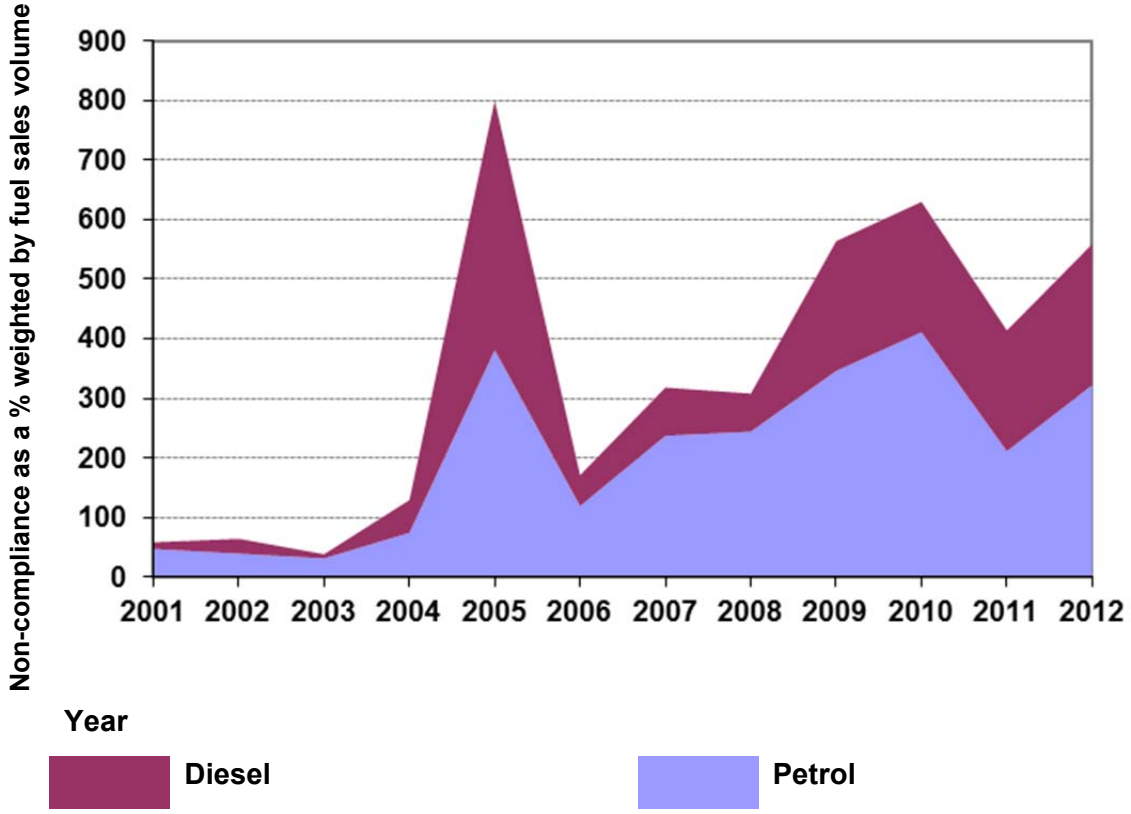
3.3.3 Compliance with Limit Values

The following charts show the trends in the numbers of limit value non-compliances for petrol and diesel fuels in the European Union. Figure 3-11 gives the temporal trend in limit value non-compliance between 2001 and 2012. Figure 3-12 and Figure 3-13 provide a breakdown by key parameters of the temporal trends in non-compliant samples for petrol and diesel. The figures show an increase in non-compliances between 2011 and 2012 for almost every parameter.

However, in 2012 samples that have exceeded tolerance limits, both in absolute terms and as a proportion of fuel sales (see Figure 3-6) are still higher than their levels in 2000-2004 (and 2006-2008). This may be the result of a number of different factors:

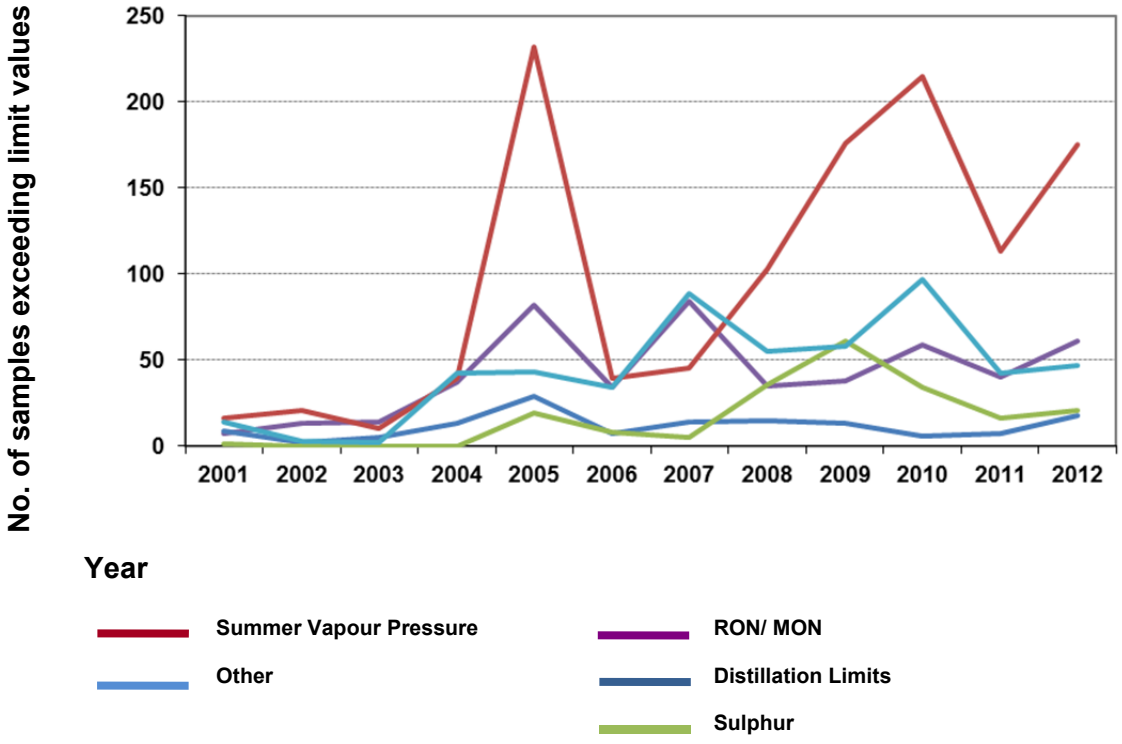
- Greater accuracy of reporting non-compliant samples. Historically, Member States have reported the maximum/ minimum values of all samples. However, this does not describe how many samples were found to be out of specification. Updates to the design of the reporting template and requests for clarification from Member States has greatly enhanced the detail given within Member State reports with regard to compliance reporting.
- Time taken for Member States and/or suppliers to adapt to new specifications, as limit values change (with new parameters added and/or more stringent limits introduced) – e.g. sampling manganese
- Specific problems with new fuel grades (for example, vapour pressure limits with high ethanol blends of gasoline).
- Member States are increasingly providing detail about the test methods used to determine fuel quality. As this level of detail increases, the accuracy of summary reporting also improves.

Figure 3-11: EU27 % temporal trend total limit value non-compliances for petrol and diesel fuels



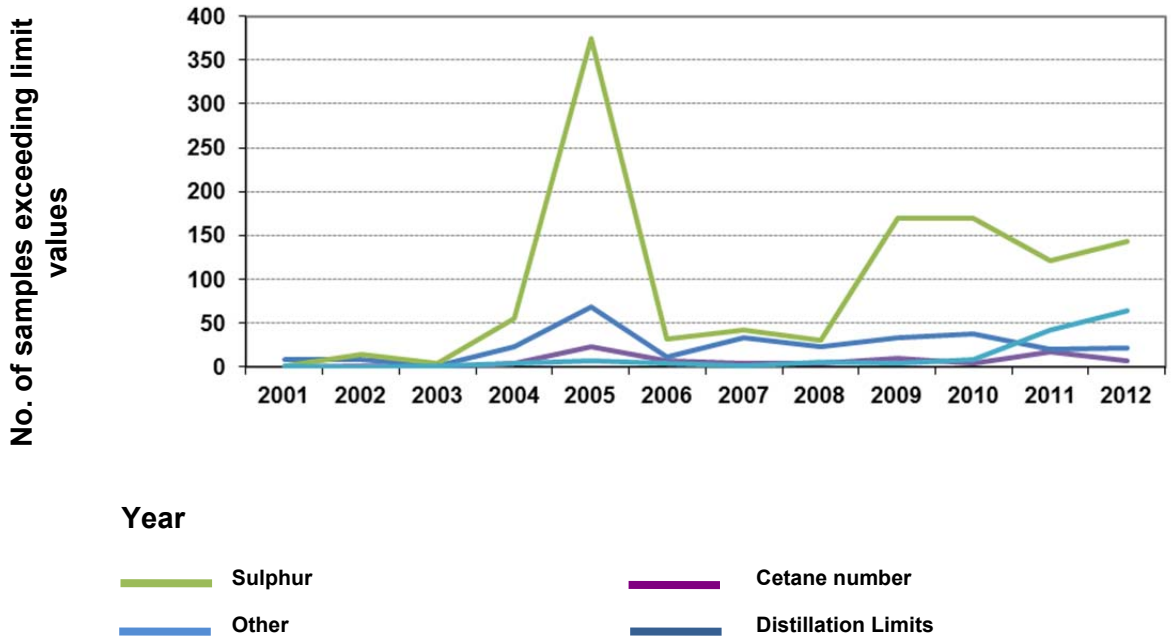
* Excludes France in 2003 - 2005, as no submissions were provided. Excludes Luxembourg in 2007 to 2009 and Malta in 2006 and 2009 as no reports were provided. In addition, the EU expanded in 2004, 2007 from 15 to 27 Member States.

Figure 3-12: EU27 temporal trends in numbers of samples exceeding limit values for specific petrol parameters



* Excludes France in 2003 - 2005, as no submissions were provided. Excludes Luxembourg in 2007 to 2009 and Malta in 2006 and 2009 as no reports were provided. The EU expanded in 2004, 2007 from 15 to 27 Member States.

Figure 3-13: EU27 temporal trends in numbers of samples exceeding limit values for specific diesel parameters



*** Excludes France in 2003 - 2005, as no submissions were provided. Excludes Luxembourg in 2007 to 2009 and Malta in 2006 and 2009 as no reports were provided. In addition, the EU expanded in 2004, 2007 from 15 to 27 Member States.**

4 Statistical Analysis

Key Messages

The majority of Member States have provided additional detail within their 2012 report to enable further statistical analysis of parameter results. Member states who did not provide additional information are the Netherlands, Romania and Sweden. Bulgaria did not provide sufficient data for all petrol grades, but did for all diesel grades. A limited number of other Member States did not provide full information for some grades.

Petrol

- Parameter reporting shows that test results for RON and MON are relatively tight to fuel quality specification, with the majority of results above the specified minimum for the parameter (RON; 91 for RON 91 fuels or 95 for fuels with the higher specification and MON; 81 and 85 respectively); with very few outliers. Discussions with members of CEN Technical Committee indicate that this is to be anticipated – given the 'economic' value of the properties.
- Petrol vapour pressure shows a greater range in reported test results; with more Member States exceeding maximum specified limits (60 kPa and 70 kPa for countries with derogation for low ambient summer temperatures). In addition, the skew of results from samples tested within the Member States shows greater variation.

Diesel

- Density at 15°C demonstrates variation in results – with very few samples exceeding or approaching the maximum limiting values for the parameter (845 kg/m^3). Only Portugal reports outliers that exceed the limiting value while the majority of Member States report results comfortably within the range of 830 – 840 845 kg/m^3.
- Distillation results for diesel show results where the majority of samples are tight to the specified limit (maximum 360 °C), but most Member States also demonstrate significant outliers demonstrated by a long 'tail' on charted results.

4.1 Introduction to the Analysis Process

In evaluating different Member State submissions there are clear variations in trends that emerge. Sample analysis results for different parameters show different trends with regards to levels of compliance with limit values and the range distribution of sample analysis results in relation to the mean and Directive limit values. In some cases the mean of sample values can appear very close to the Directive limit values even without any samples that exceed tolerance limits. As part of the assessment of the compliance in relation to these analyses it is therefore useful to understand the reasons behind these differences.

In previous years, there was no suitable method to statistically verify Member State submission analysis results with a level of demonstrable confidence, due to the level of information provided. Therefore, starting in 2010, individually selected parameters have been subject to a higher level of analysis with the aim of determining trends and statistical anomalies within the EU-wide sample data. With this aim, Member States were asked to provide two additional pieces of information in their 2010 FQM reports from the 2010 reporting year; the lower 25% data range and the upper 25% data range (e.g. the results placed at 25% and 75% within the total results for that parameter). The majority of Member States were able to provide this information and individual summaries have been provided in Member State chapters. The Netherlands, Poland, Romania and Sweden did not provide sufficient additional information for the analysis. Bulgaria did not provide sufficient data for all

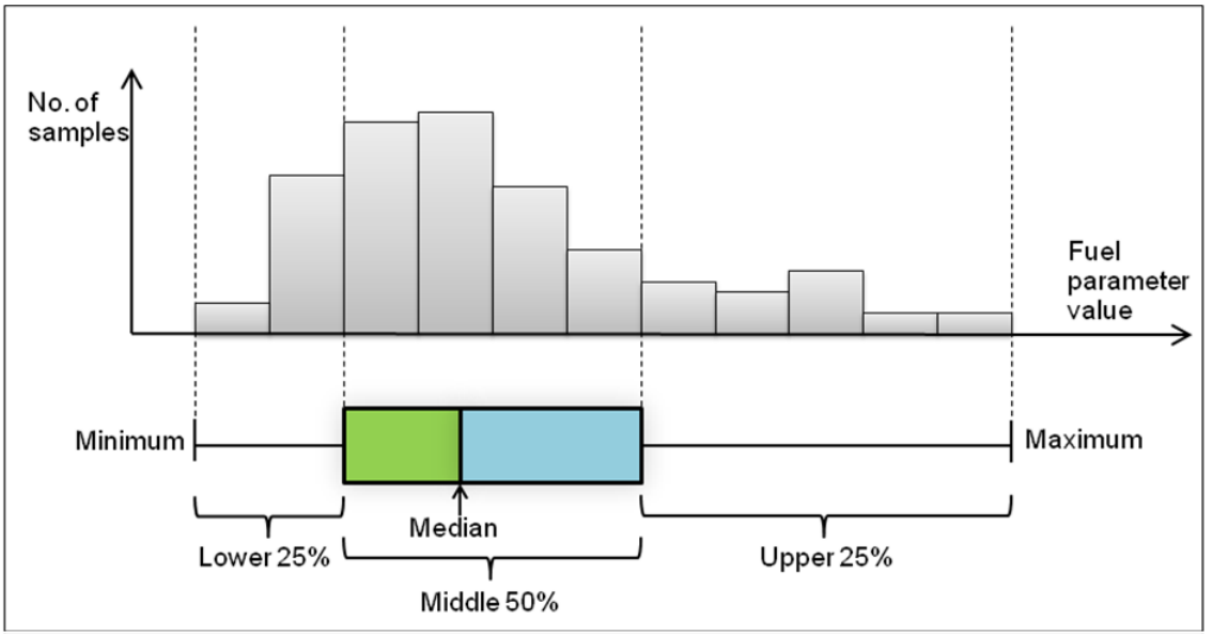
petrol grades, but did for all diesel grades. In addition, where very low quantities (<5 samples) have been taken, results have been omitted from the overall calculations. The purpose of this section is to present the data across the EU to help identify possible trends or anomalies in fuel quality within the community.

The following charts are known as box-plots and they display the distribution of fuel characteristics by illustrating the:

- Sample minimum (already required by the Directive)
- Lower 25% range (requested from 2010 onwards)
- Middle 50% range (otherwise known as the mean - already required by the Directive)
- Median (requested from 2009 onwards)
- Upper 25% range (requested from 2010 onwards)
- Maximum (already required by the Directive)

Figure 4-1 illustrates how the box plot is constructed from a histogram (above the box plot) as a guide. This allows a comparison of one Member State fuel sample distribution with another which could aid in the spotting reporting irregularities. Figure 4-1 provides an illustration of a skewed distribution. This means that there are more samples on one side of the range than the other (to the right). This will mean that one of 25% values ('tails' in the box plot) will be longer than the other, and that the median value will not be centred in the middle 50% box. Box plots will help to determine how wide the sample values range – or how close they are to fuel specifications set by the Directive across the Community.

Figure 4-1: Explanation of Box Plot



This statistical analysis, for 2012 has been presented for some key parameters for petrol and diesel fuels. The selected parameters may change in future years with the introduction of new, key parameters and may also change to more closely monitor trends as fuel specifications change over time. The following parameters have been presented in this section, and within Member State reports;

Petrol:

- Research Octane Number
- Motor Octane Number
- Summer Vapour Pressure

Diesel:

- Density at 15^{o}C
- Distillation – 95% v/v recovered

Sample results for these parameters have been depicted using box plots based on the reported sample minimum, lower quartile (Q1), median (Q2), upper quartile (Q3), and the maximum sample value.

Sample results have been presented in the following figures with limit values for the parameter (maximum or minimum) to demonstrate the skew of sample results. Limit value does not depict compliance or non-compliance as the Tolerance Limits - which do determine whether sample results can be considered to be compliant or non-compliant - are dependent on the test methods used – and the reproducibility of those test methods. The level of detail provided by Member States is not yet consistently sufficient to assess parameters against test methods used. However, limit values represent the maximum and minimum limits as determined by Directive specifications.

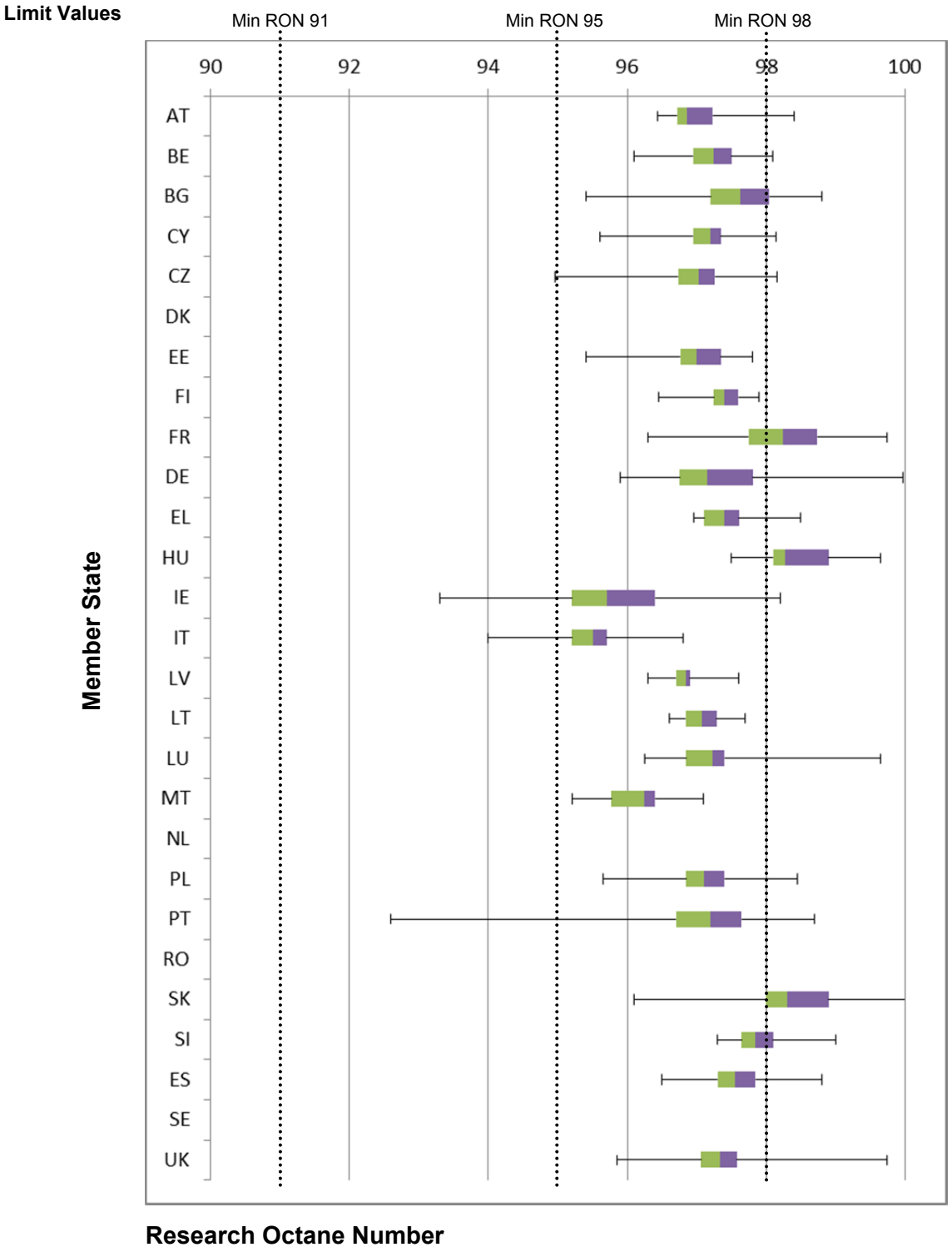
If less than 5 samples were tested and reported by the Member State, results have been removed from the following charts to avoid inaccuracies (a minimum of 5 datasets are required). In addition, where data appeared to be inaccurate, the data has been removed to avoid anomalous skew in the data (e.g. where reported results do not conform to maximum/ minimum parameter results provided in sampling analysis). More detail on Member State specific results and the anomalies observed have been provided within individual Member State chapters.

4.2 Key parameters – EU results

4.2.1 Petrol

4.2.1.1 Research Octane Number (RON) Analysis

Figure 4-2: Box plot of RON samples per Member State



***Results from <5 samples have been removed and anomalous datasets have been removed.**

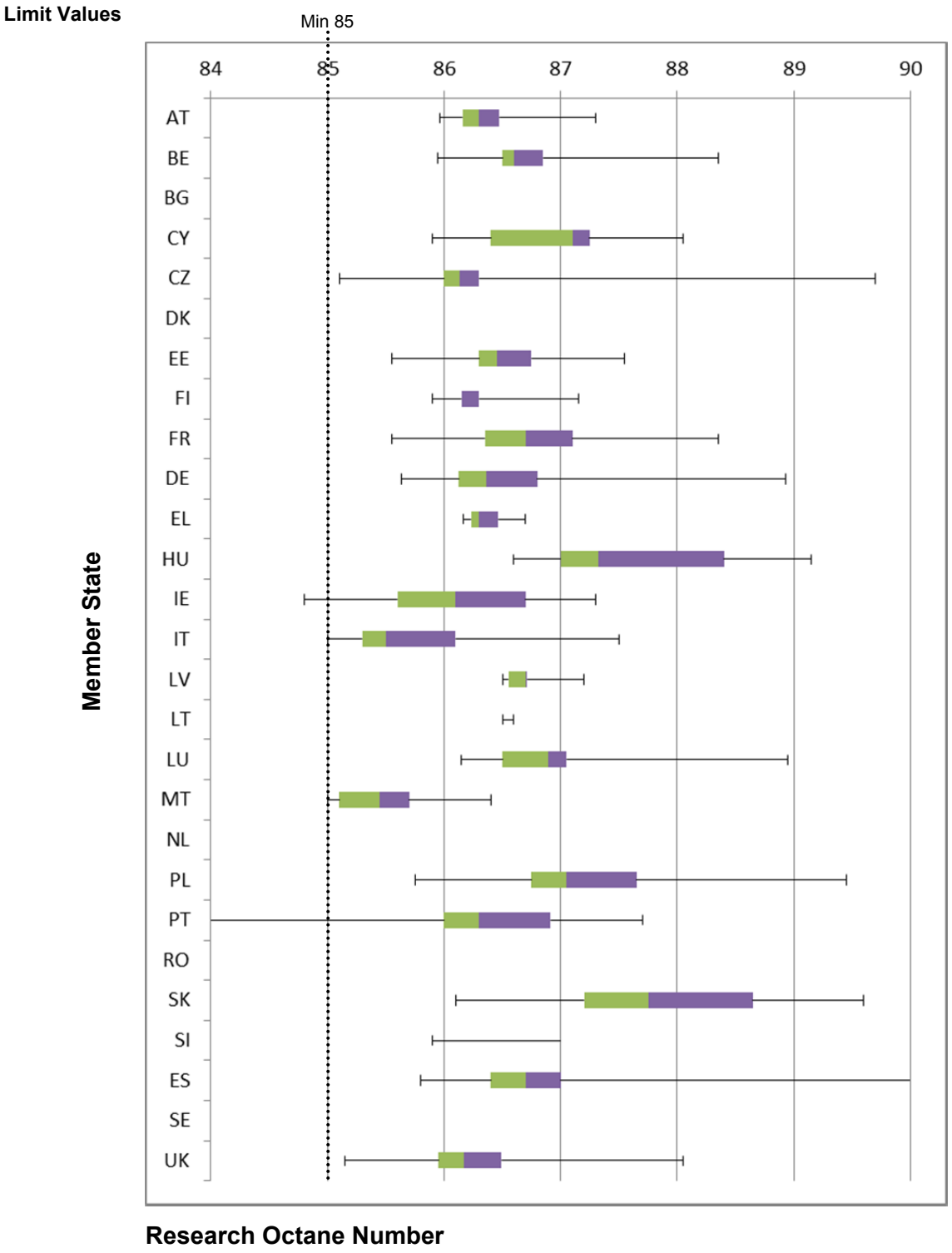
***No data provided by for DK, NL, RO and SE**

***Please see Glossary in Section 33 for country abbreviations**

Sample results for Research Octane Number in 2012 have been presented in Figure 4-2 and show that fuels in the Community (according to the data provided by Member States) were moderately tight to specifications for RON. The majority of fuel sold in the EU is RON 95 (82%), with another 13% of RON 95-98, and so it is unsurprising that the majority of sample results are above the minimum limit value of 95. A further 4% of fuel sold in the EU was RON 98, which further pushes the average about the 95 limit value. Overall, it appears that suppliers to the European market are generally not struggling to blend fuels to meet the RON specifications, with the majority of samples for most Member States achieving RON values of 96-98. RON 91 fuels (with a minimum limit value of 91) were available in Austria, the Czech Republic, Denmark and Germany. Where the Box Plot tail exceeds the minimum of 95 for Member States (IE, PT and IT) where no RON 91 fuel sales are reported, this indicates that non-compliant samples have been found in 2012. Further details of individual member States sample results have been provided in the following Member State chapters.

4.2.1.2 Petrol - Motor Octane Number (MON) Analysis

Figure 4-3: Box plot of MON samples per Member State



***Results from <5 samples have been removed and anomalous datasets have been removed.**

***No data provided by for DK, NL, RO and SE**

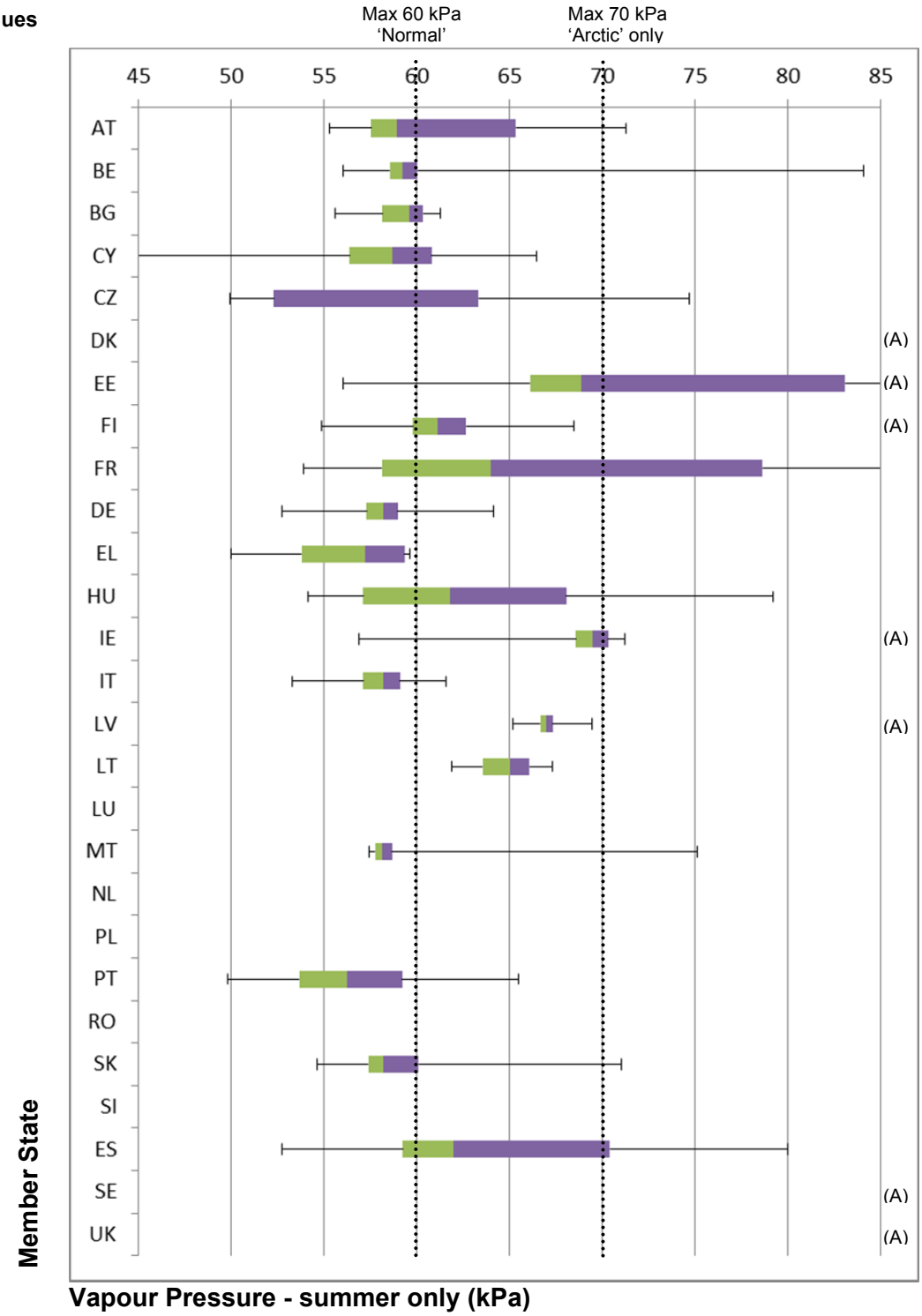
***Please see Glossary in Section 33 for country abbreviations**

Figure 4-3 demonstrates the MON results for petrol in 2012. It appears that in general, MON is blended tighter to specification than RON. There is also more variation in MON results than RON, with the majority of samples for most Member States having MON values of 86-89. Results extending as far as MON 81 can be expected in Austria, the Czech Republic,

Denmark and Germany where lower specification RON 91 fuels were available on the market – however, as can be seen, other Member States have also reported sample results for MON that fall below the specified minimum limit of 85 for higher grade fuels. On the whole, though, even outliers largely fall within the specified limits for the parameter.

4.2.1.3 Petrol - Vapour Pressure (VP) Analysis

Figure 4-4: Box plot of Vapour Pressure samples across Member States



***Results from <5 samples have been removed and anomalous datasets have been removed.**

***Member States represented in the data above with a derogation to report according to 'Arctic' conditions with a corresponding summer vapour pressure maximum limit of 70kPa are Denmark, Estonia, Finland, Ireland, Latvia, Sweden and the UK. (A) denotes arctic derogation in place**

***The maximum vapour pressure limit in Lithuania is 70kPa – however the state remains classed as 'normal'.**

***Please see Glossary in Section 33 for country abbreviations**

The Summer Vapour Pressure results in 2012 demonstrate more separation in fuel quality between the Member States in Figure 4-4. Vapour pressure for the summer period is monitored closely and fuel specifications are subject to different limits in the winter period. Only the summer vapour pressure results are requested from Member States, however some also provide winter results. Wherever possible, winter results have been excluded from the chart. In addition, there is a transitional period; during this time, twice a year the summer and winter fuels are swapped in supply outlets.

Some Member States also make use of the arctic derogation, which allows a higher summer vapour pressure of 70kPa. These are denoted with an (A) in the figure above.

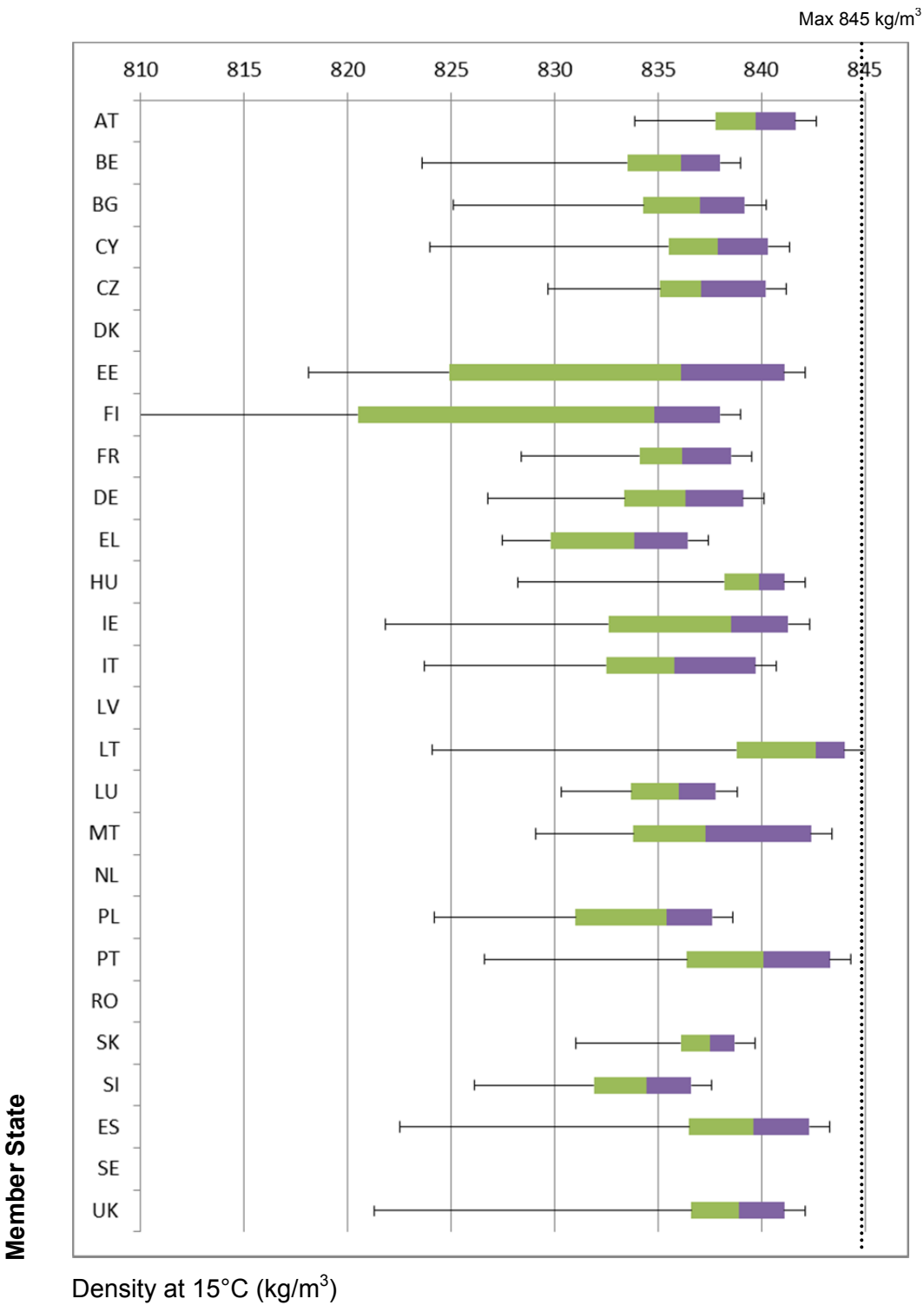
In general, it can be seen that vapour pressures measured from samples in many Member States are considerably higher than in previous years. In addition, from the figure above it appears that many Member States have reported samples over the parameter limit. However, this may be misleading as since 2011 a number of new fuel grades with higher (5% and above) blends of ethanol are reported for the first time (e.g. France reported two petrol fuel grades: RON 95 E5 and RON 95 E10 with 5% and 10% bioethanol content respectively). Ethanol causes a rapid rise in vapour pressure, which makes it difficult for refiners to meet the specification. However the Commission has introduced a derogation to accommodate this challenge, which is not able to be reflected in the above graph.

There is a lack of consistency between Member States with regard to the transition between summer and winter periods – with some Member States excluding results from samples taken during the transitional period and others reporting all summer, winter and transition period results. Therefore, until there is greater consistency, the results above may not provide an accurate comparison and might portray poorer quality fuels than neighbouring States when it might not be the case. In addition, some Member States have reported that some non-compliances against the vapour pressure limit are a result of retailers that have a low sales turnover continuing to sell winter blend in the summer period.

4.2.2 Diesel

4.2.2.1 Density at 15°C Analysis

Figure 4-5: Box plot of Density samples across Member States



***Results from <5 samples have been removed and anomalous datasets have been removed.**

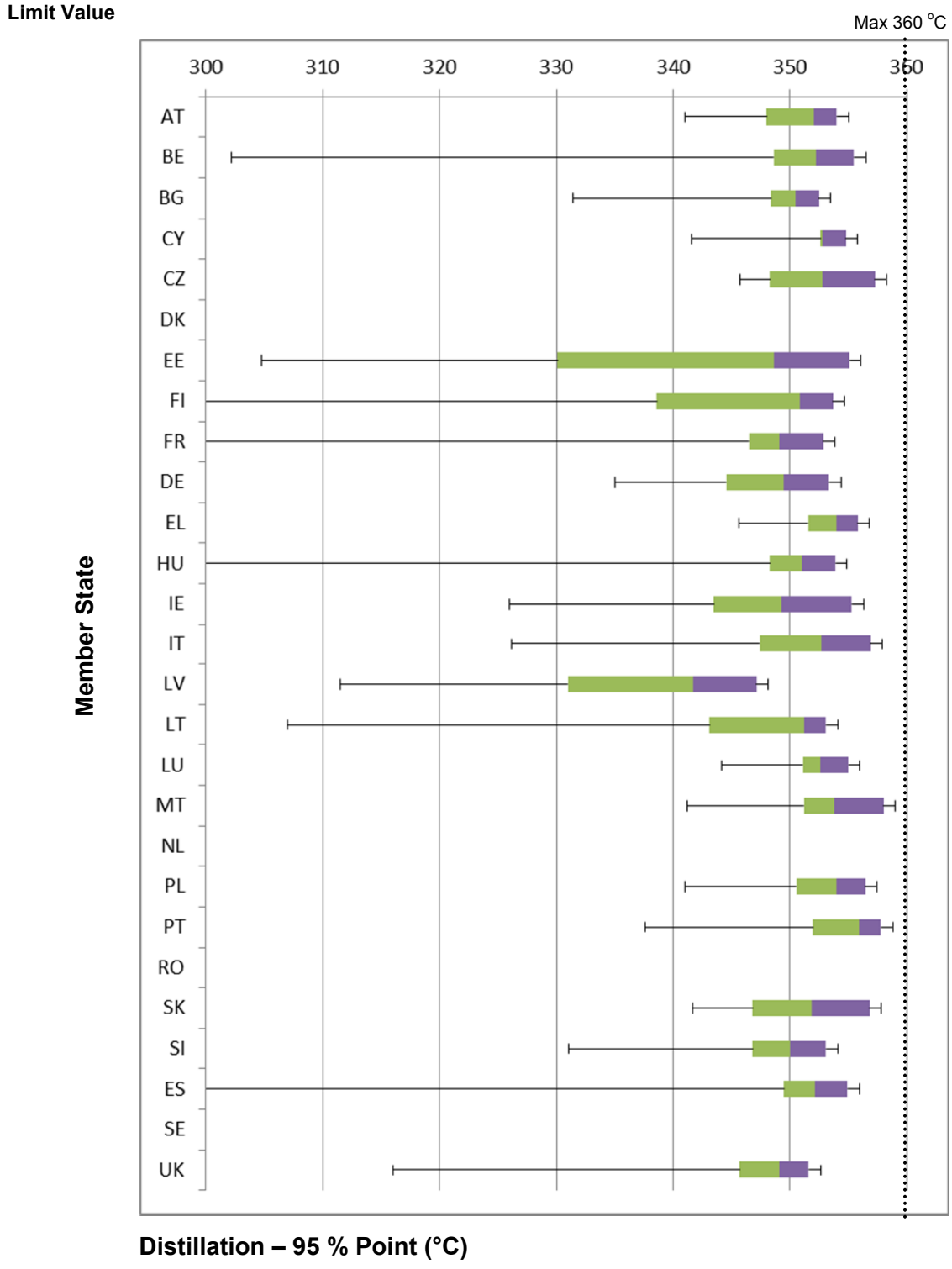
***Please see Glossary in Section 33 for country abbreviations**

As in 2011, in 2012 no Member State can be seen to have exceeded the maximum limit value for Density and the majority of Member States results show a comfortable margin between maximum limits for the parameter, and the Limit Value. In spite of this, the majority

results are skewed towards the maximum value, rather than the minimum value (as can be observed by the boxed areas remaining tight to the maximum value). This could suggest that the minimum values reported are outliers. It is possible that higher blends of FAME could result in refiners blending tighter to this parameter specification in future, as FAME has a higher density (approx. 890 kg/m^3).

4.2.2.2 Diesel - Distillation – 95% Point Analysis

Figure 4-6: Box plot of Distillation samples across Member States



***Results from <5 samples have been removed and anomalous datasets have been removed.**

***Please see Glossary in Section 33 for country abbreviations**

Similar to the results for Density at 15 ^{o}C, European Community wide results for Distillation results are skewed towards the maximum value but no exceedances are reported. This is a repeat of the situation in 2011. This could suggest that the minimum values reported are outliers. Member States have reported results that are comfortably within the limit value for diesel; however a much wider range than the results discussed previously.

5 Austria

5.1 Fuel Availability 2012

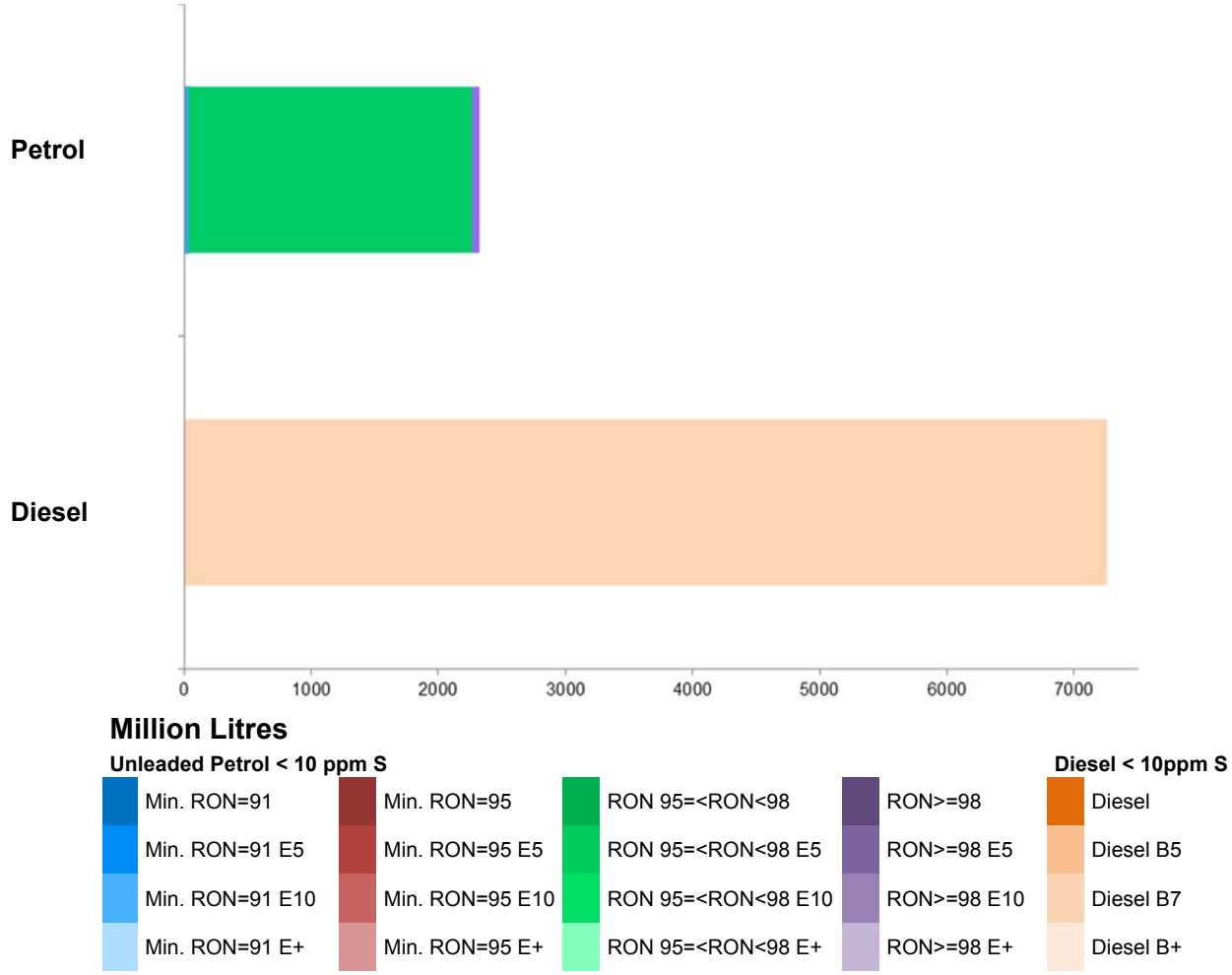
The following table lists the fuels that were reported to be available nationally in 2012.

Table 5-1: National fuel grade

Fuel grade	National fuel grade
Regular unleaded petrol (minimum RON = 91) E5	Normal
Unleaded petrol (minimum 95 =< RON < 98) E5	Super
Unleaded petrol (minimum RON >= 98) E5	Super Plus
Diesel fuel B7	Diesel

5.1.1 Sales, sampling and reporting

Figure 5-1: Fuel Sales proportions by fuel type



During 2012 fuel sales in Austria were dominated by diesel fuel sales. More than 7.2 million litres of diesel was sold in comparison to just over 2.3 million litres of petrol fuel sales (all petrol grades combined). Petrol fuel sales were mainly comprised of fuel grade RON 95=<RON<98.

Table 5-2: Fuel sales and sampling

Fuel type (Parent Grade)	Sales (Million litres)	Sales, % total of fuel type	Samples (1) S	Samples (1) W	Samples (1) TR (2)	Separate S/W(3)	Para-meters measured (4)	Add. Notes
Unleaded petrol min. RON=91 (<10 ppm S) E5	41	1.8%	3	0	1	Yes	19 of 19	
Unleaded petrol 95=<RON<98 (<10 ppm S) E5	2,215	96.1%	50	50	50	Yes	19 of 19	
Unleaded petrol RON>=98 (<10 ppm S) E5	49	2.1%	3	0	2	Yes	19 of 19	
Total Petrol	**2,305**	**100.00%**	**56**	**50**	**53**	**Yes**	**19 of 19**	
Diesel (<10 ppm sulphur) B7	7,294	100.0%	50	50	50	Yes	6 of 6	
Total Diesel	**7,294**	**100.00%**	**50**	**50**	**50**	**Yes**	**6 of 6**	

(1)	Samples	The actual number of samples taken by the Member State in the summer (s) and winter (w) periods
(2)	TR	Total requirement per summer and winter period according to EN 14274. Brackets () show where a national model is being used, and the requirement is indicative to demonstrate equivalence with EN14274.
(3)	Separate S & W?	Yes indicates separate summer and winter reporting, and No indicates full year sample results reporting only.
(4)	Parameters measured	Currently 19 petrol parameters should be tested and reported by the Member States and 6 diesel parameters. Austria has reported all parameters for all fuel grades.

5.1.1.1 Petrol Samples

Austria has complied with minimum sampling requirements for Unleaded petrol 95=<RON<98 (<10 ppm S) E5 and one sample more as required for the two other petrol fuel grades. However, sampling for Unleaded petrol RON>=98 E5 and Unleaded petrol min. RON=91 (<10 ppm S) E5 was only performed during the summer period due to the small number of two samples required according to the EN 14274 minimum samples requirements.

5.1.1.2 Diesel Samples

Austria met the minimum sampling requirements for diesel fuel grade in 2012.

5.2 Fuel Quality Monitoring 2012

5.2.1 Description of System

Responsible organisation(s)	Umweltbundesamt GmbH Wien
Fuel Quality Monitoring System (FQMS)	EN 14274 Statistical model A
Country Size	Small
Summer Period	Normal
Location(s) of sampling	Service stations
Time/frequency of sampling	The 3 samples for petrol fuel grade RON 91have been taken over 2 months in 2012, with all samples taken during the summer over 2 months. For fuel grade RON 95 and diesel, samples have been taken over 7 months of the year sampling in 3 months in summer and 4 months in winter. Samples for fuel grade RON 98 were taken in 2 months - in the summer period.
Specification of test methods	As per Directive 98/70/EC - Austria uses the EN 14274 norm for the interpretation of the analyses.
Collection of sales data	Sales data for 2012 has been provided by the Federal Ministry of Economy, Family and Youth. The data are published on the website of the Austrian Economic Chambers called “Verbrauchsstatistik” since 2006 (http://portal.wko.at/wk/startseite_dst.wk?AngID=1&DstID=308)

Other details: In the past, parameters didn´t show significant differences between Austrian states, resulting in Austria using a statistical model C. Since the introduction of blending Ethanol (ETBE) to petrol fuels, it appears that there are differences due to the use of either Ethanol or Bio-ETBE in blends. Based on analysis of the past three years, Austria has chosen to switch from C to Model A (2 Macro-regions).

In total 2 exceedances were detected, within samples of petrol fuels (1x ‘Normal’, 1x ‘Super’) and one exceedance was detected for diesel.

In Austria the fuel Grade E10 doesn’t exist. All fuels sold contained Ethanol in compliance with the EN 228 fuel standard (5% volume). On average 4.88% of bio content was blended over all petrol grades. Furthermore Diesel is blended with FAME and HVO. The former of these are sold as "premium diesel grades". Even though HVO is not detectable, the Mineral oil industry reports that the blended amount is equal to 7% FAME.

5.2.2 Fuel Quality Monitoring System

5.2.2.1 Sampling

Samples are taken only from service stations. The organisation responsible for this is Umweltbundesamt GmbH.

5.2.2.2 FQMS Administration

The control of the quality of petrol and diesel fuels is conducted by the Federal Environment Agency on behalf of the Federal Ministry Agriculture, Forestry, Environment and Water Management. Results are checked by the Federal Ministry and then submitted to the European Commission.

5.2.2.3 National Legislation that Transposed the FQD

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

5.2.2.4 Reporting Periods

Summer period: 1st May – 30th September

Winter period: 1st October – 30th April

No arctic weather condition in Austria

5.2.3 Compliance with Fuel Quality Limit Values

Table 5-3: Petrol Fuel Grades

Normal Petrol (RON 91)- Details of samples that exceed tolerance limits:					
Parameter	**Limit Value**	**Tolerance Limit* (TL)**	**Max/Min value of samples tested**	**No samples outside TL**	**% samples outside TL**
Summer vapour pressure, kPa	60	61.8	62.9	1	33%
Member State notes One sample was found to be above the tolerance limit, a penalty was imposed.					
Super Petrol (RON 95)- Details of samples that exceed tolerance limits:					
Parameter	**Limit Value**	**Tolerance Limit* (TL)**	**Max/Min value of samples tested**	**No samples outside TL**	**% samples outside TL**
Summer vapour pressure, kPa	60	61.8	68	1	1%
Member State notes One sample was found to be above the tolerance limit, a penalty was imposed.					
Super Plus Petrol (RON 98)- Details of samples that exceed tolerance limits:					
No samples exceeded tolerance limits.					

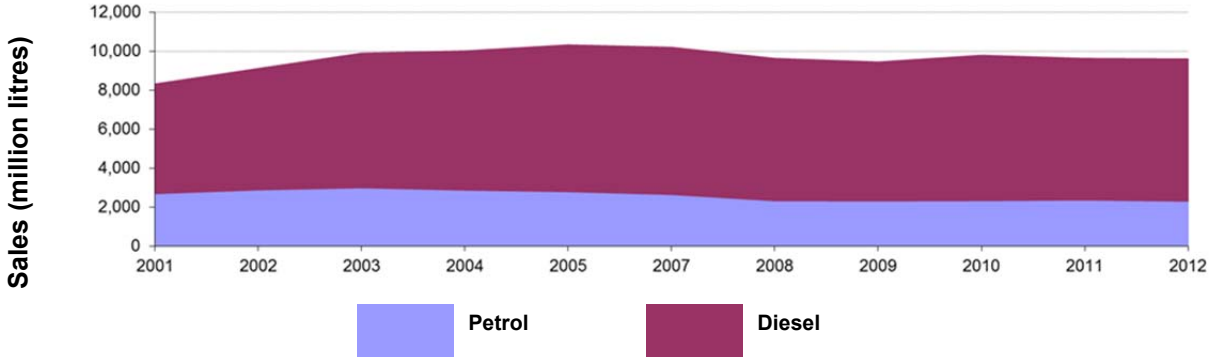
Table 5-4: Diesel Fuel Grades

Diesel - Details of samples that exceed tolerance limits:					
Parameter	**Limit Value**	**Tolerance Limit* (TL)**	**Max/Min value of samples tested**	**No samples outside TL**	**% samples outside TL**
Distillation – 95-%-Point, °C	360	365.9	366	1	1%
Member State notes One sample was found to be above the tolerance limit, a penalty was imposed.					

5.3 Temporal Trends

Figure 5-2 shows the trend in total fuel sales since 2001. Diesel sales in Austria have increased by 0.5% (33 million litres) compared to 2011 sales figures, with an overall increase of 30% since 2001. Petrol fuel sales have reduced by 2.6% (61 million litres) in the period between 2011 and 2012, with an overall reduction of 14% since 2001.

Figure 5-2: Temporal trends in national sales of petrol and diesel (million litres)



5.4 Statistical Analysis

The following charts in this section are known as box-plots and they display the distribution of fuel characteristics per Member State by illustrating the:

- Sample minimum
- Lower 25% range
- Middle 50% range
- Median
- Upper 25% range
- Maximum

For a full explanation of the information presented in a Box Plot diagram, see section 4.

Fuel sampling in Austria in 2012 recorded relatively few test results out of specification with limits. The analysis charts for petrol (Figure 5-3) and diesel (Figure 5-4) detail the distribution of sample results for the 5 selected parameters;

Petrol:

- Research Octane Number
- Motor Octane Number
- Summer Vapour Pressure

Diesel:

- Density at 15^{o}C
- Distillation – 95% v/v recovered

Sample results for these parameters have been depicted using box plots based on the reported sample minimum, lower quartile (Q1), median (Q2), upper quartile (Q3), and the maximum sample value.

5.4.1 Petrol Analysis

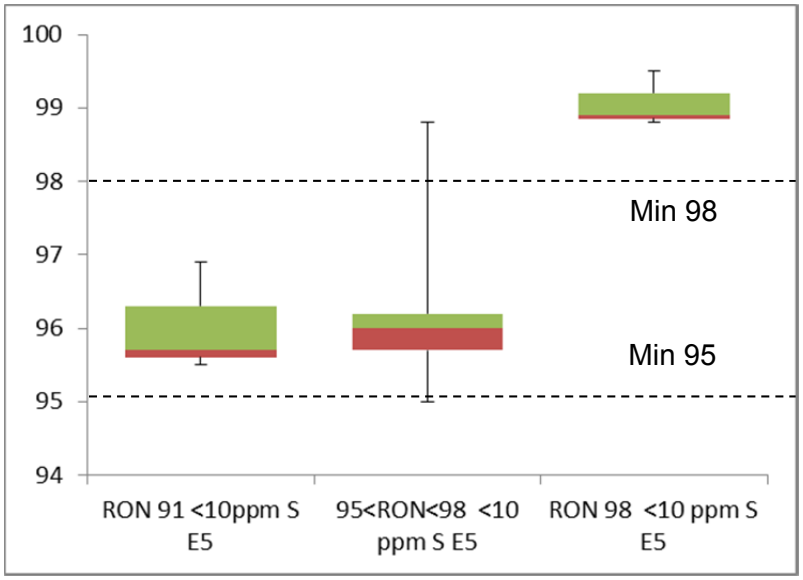
Sample results in 2012 have been presented in the following figures with limit values for the parameter (maximum or minimum) to demonstrate the skew of sample results. Note that the very low sampling of RON98 E5 (3 samples) means that the statistical analysis has limited application.

RON and MON sample results show that the fuels available in Austria have reasonably small variation in Octane levels for the majority of samples, with one or two outliers.

Summer Vapour pressure results shows that the samples were found to be tighter to the specifications of the Fuel Quality Directive, with some samples exceeding limit values and the majority of samples skewed closer to the limit.

Figure 5-3: Petrol analysis

Research Octane Number



Motor Octane Number

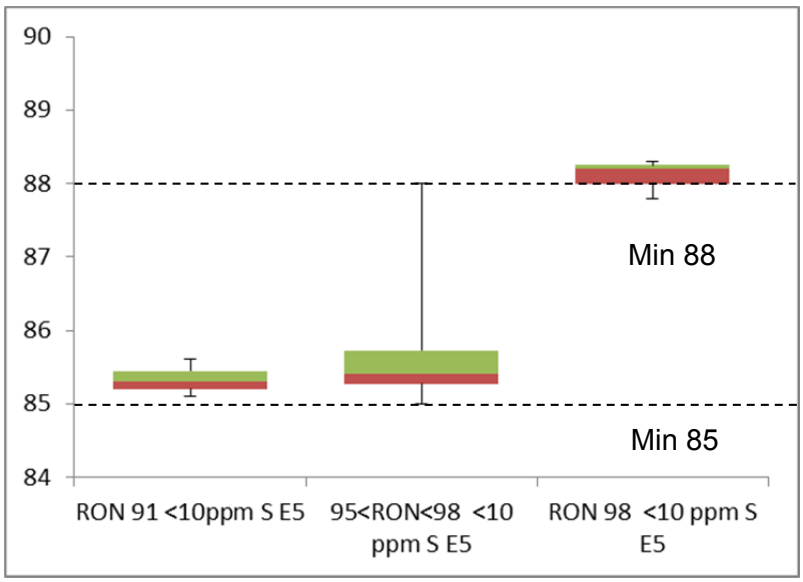
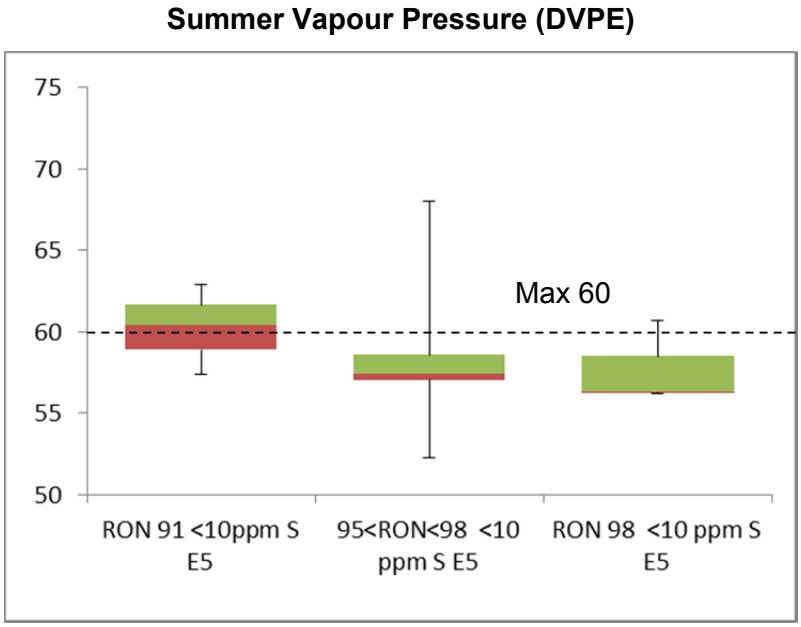


Figure 5-3: Petrol analysis (continued)



5.4.2 Diesel Analysis

One Diesel sample exceeded tolerance limits for Distillation. All Diesel samples were below the required Density at 15°C.

For Distillation, one sample exceeded the limit values and tolerance limits with a maximum value of 366°C. However, the non-compliant sample value was an outlier, with all other recording values comfortably below the limit value for the parameter.

Figure 5-4: Diesel analysis

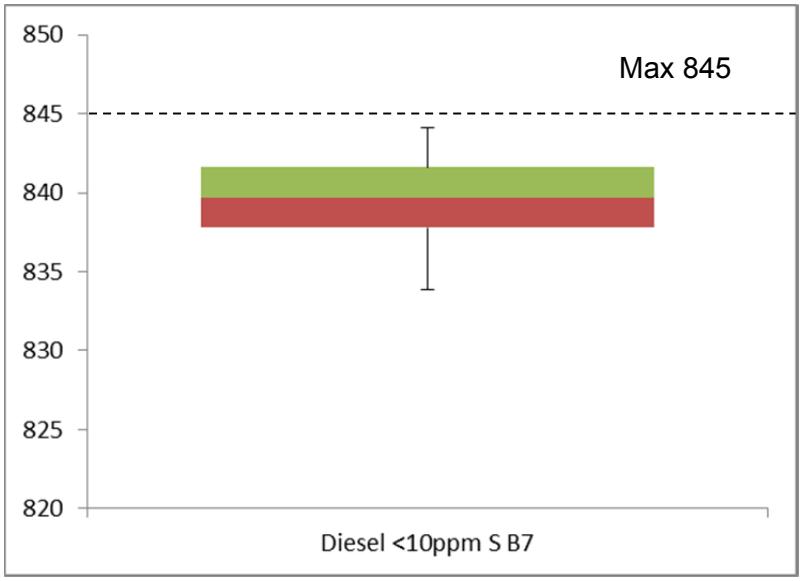
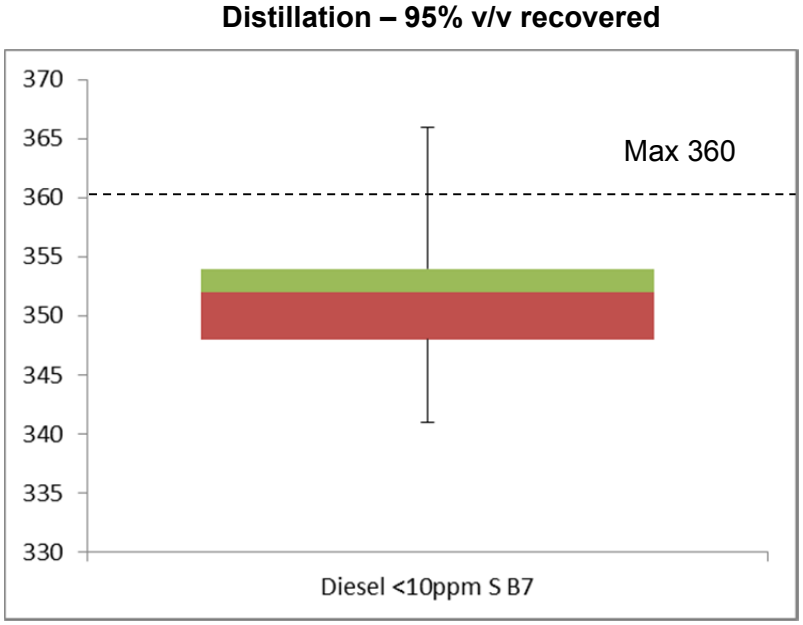


Figure 5-4: Diesel analysis (continued)



5.5 Key Areas for Improvement

The following table summarises the main areas in which improvements could be made to the monitoring system, reporting or compliance with Directive limit values. The table includes key recommendations from the previous year to give an assessment of what action has been taken by the Member State to address any issues that may have been highlighted.

Key Areas for Improvement (3 years)		
	Monitoring	**Reporting**
2012	• Austria has complied with minimum sampling requirements.	The 2012 report was received on time.
2011	• Austria have complied with minimum sampling requirements for all petrol fuel grades, with the exception of Unleaded petrol RON>=98 E5, where they exceeded the sampling requirement in the summer period but did not report any samples in the winter period. No information has been provided about test methods for 2011. • The source of sales data for 2011 has not been provided.	The 2011 report was received on time.
2010	• Uses Model C but Model A may be appropriate due to the country's size	The 2010 report was submitted days after the Member State reporting deadline

6 Belgium

6.1 Fuel Availability 2012

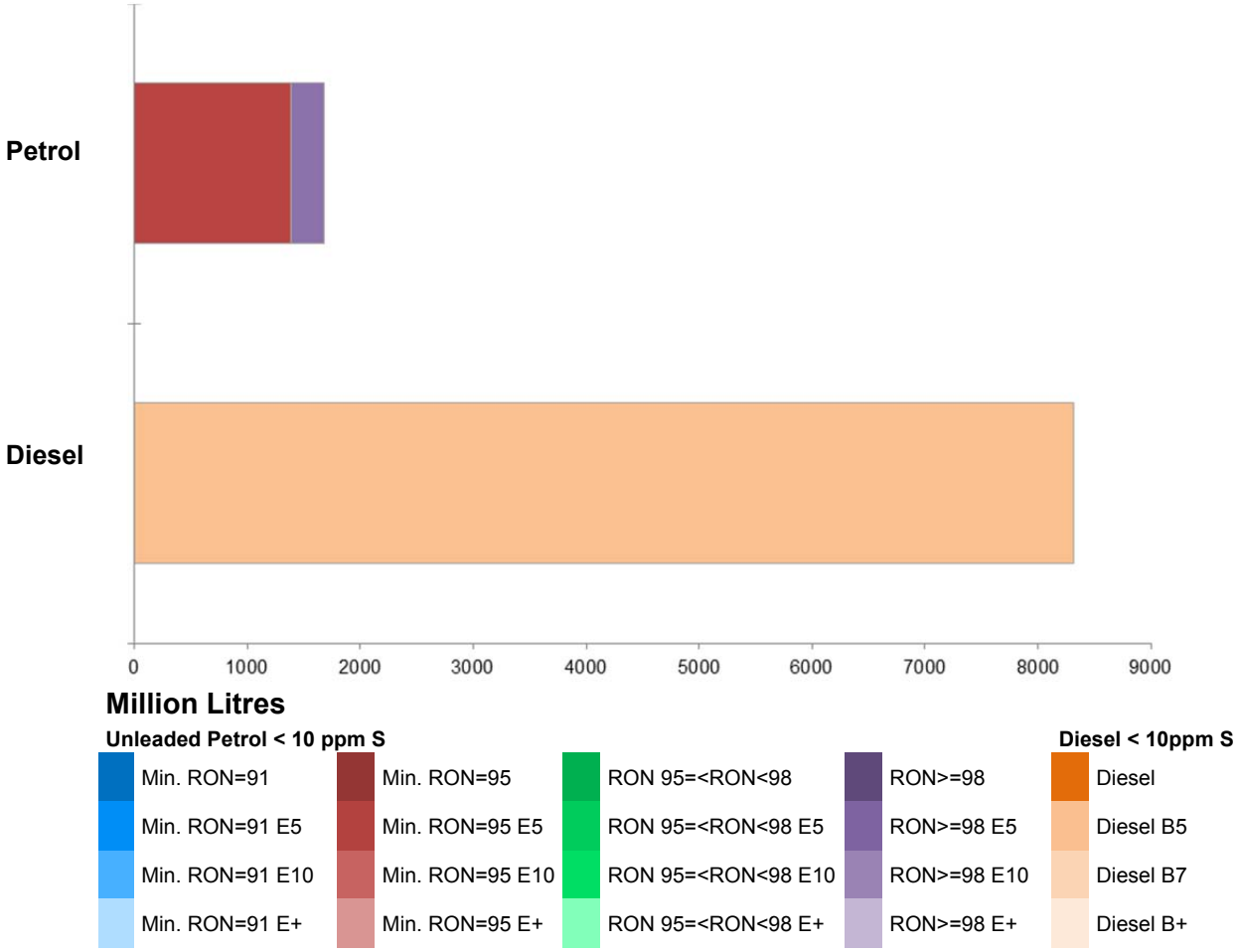
The following table lists the fuels that were reported to be available nationally in 2012.

Table 6-1: National fuel grade

Fuel grade	National fuel grade
Unleaded petrol (minimum RON = 95) E5	ES 10ppm S
Unleaded petrol (minimum RON >= 98) E5	S+ 10 ppm S
Diesel fuel B5	Diesel 10 ppm S

6.1.1 Sales, sampling and reporting

Figure 6-1: Fuel Sales proportions by fuel type



Fuel sales in 2012 in Belgium show that diesel continue to dominate the automotive fuel sales market. 8,317 million litres of diesel fuel was sold in 2012 and all diesel fuels sold contained up to a maximum of 7% biofuel content. In contrast, only 1,682 million litres of petrol was sold in 2012, with a fuel grade split of RON 95 (82%) and RON 98 (18%). All petrol fuel grades contained up to 5% biofuel content.

Table 6-2: Fuel sales and sampling

Fuel type (Parent Grade)	Sales (Million litres)	Sales % total of fuel type	Samples (1) S	Samples (1) W	Samples (1) TR (2)	Separate S/W(3)	Parameters measured (4)	Add. Notes
Unleaded petrol min. RON=95 (<10 ppm S) E5	1,385	82.37%	912	1172	(50	Yes	19 of 19	
Unleaded petrol RON>=98 (<10 ppm S) E5	297	17.63%	69	86	(50)	Yes	19 of 19	
Total Petrol	**1,682**	**100.00%**	**981**	**1258**	**(100)**	**Yes**	**19 of 19**	
Diesel (<10 ppm sulphur) B5	8,317	100.00%	2498	3538	(50)	Yes	6 of 6	
Total Diesel	**8,317**	**100.00%**	**2498**	**3538**	**(50)**	**Yes**	**6 of 6**	

(1)	Samples	The actual number of samples taken by the Member State in the summer (s) and winter (w) periods
(2)	TR	Total requirement per summer and winter period according to EN 14274. Brackets () show where a national model is being used, and the requirement is indicative to demonstrate equivalence with EN14274.
(3)	Separate S & W?	Yes indicates separate summer & winter reporting, and No indicates full year sample results reporting only.
(4)	Parameters measured	Currently 19 petrol parameters should be tested and reported by the Member States and 6 diesel parameters.
	Add. Notes	

6.1.1.1 Petrol Samples

- As in previous years, Belgium has sampled in high quantities, meeting and in some cases exceeding the minimum required sample quantities in order to demonstrate statistical equivalence with EN 14274 recommendations. Though Belgium are using the national system, they have still met the required 50 samples for summer and winter periods as required for models A and C and therefore do show that they are compliant with sampling requirements.

6.1.1.2 Diesel Samples

- Sample quantities for diesel exceed the minimum number of samples required to demonstrate statistical significance with EN 14274. Though Belgium are using the national system, they have still met the required 50 samples for summer and winter periods as required for models A and C and therefore do show that they are compliant with sampling requirements.

6.2 Fuel Quality Monitoring 2012

6.2.1 Description of System

Responsible organisation(s)	Fapetro
Fuel Quality Monitoring System (FQMS)	National
Country Size	Small (<15 million tonnes of fuel sales)
Summer Period	Normal
Location(s) of sampling	Refuelling stations
Time/frequency of sampling	Samples of all fuel grades have been taken in every month throughout the year.
Specification of test methods	As per Directive 98/70/EC - Belgium uses the ISO 4259 norm for the interpretation of the analyses results from 1 January 2009. All the samples were analysed by labs that were ISO 17025 certified.
Collection of sales data	Sales data are collected by the Energy Department of the Federal Public Service Economy, SMEs, Independent Professions & Energy.

Other details: None non-compliant sample showed results that proved that the infraction was due to fraud.

6.2.2 Fuel Quality Monitoring System

6.2.2.1 Sampling

Fapetro took 8275 samples at public refuelling points (service stations) amongst whole Belgium in 2012. We are happy to announce that the evaluation of the results showed good quality of the fuel sold on the Belgium market. Only a very small number of samples were non- compliant.

Concerning the results provided for petrol, Fapetro wants to draw special attention to the Belgian annex of the NBN EN 228 mainly for the parameter vapour pressure.

National specifications for the vapour pressure are:

- in summer (kPa): min 45.0 - max 60.0

- in winter (kPa): min 65.0 - max 95.0

- 2 transition periods: the months April and October (kPa): min 45.0 - max 95.0

Vapour pressure is analysed throughout the year in Belgium, as well as in summer as in winter.

The transition periods are used to give the fuel producers the ability to adapt the production of the fuel quality in order to meet the specifications of the summer or winter fuel quality.

However every year Fapetro notices a boost off DVPE infringements in the month may. Those infringements are involuntary and due to low stock rotation in mainly small retail stations (at the end of the chain). At those stations the 'winter' quality petrol staid longer in stock as the retail station didn't sell that much. As a result of this the transfer period from 'winter' to 'summer' quality petrol was disturbed. All those infringements were small, harmless for the environment and involuntary.

Non-compliant samples for vapour pressure, concerning petrol, were due to low rotation of stocks in transition periods between winter and summer grades.

All the samples were analysed by labs that were ISO 17025 certified. All the used test methods are accredited or the demand for accreditation is in progress.

6.2.2.2 FQMS administration

Fapetro is responsible for the quality monitoring of the automotive fuel sold in Belgium. Belgium uses the ISO 4259 standard for the interpretation of the analyses results from 1 January 2009. Belgium uses a national system that existed even before the FQMS was developed. The number of taken samples is higher than in the other statistical models A, B or C.

Above that Fapetro also effects twice a year an audit in the labs in order to reassure itself of the quality of the reported analysed samples.

6.2.2.3 National Legislation that transposed the FQD

Fuel Quality Directive was transposed to Belgium legal system as:

- Royal Decree of 22 February 2005 relating to names, characteristics and sulphur content of diesel for automotive fuels;
- Royal Decree of 22 February 2005 relating to names, characteristics and sulphur content of petrol for automotive fuels.

6.2.2.4 Reporting periods

Summer – 1st May – 30th September

Winter – 1st October – 30th April

There are two transition periods for vapour pressure: April and October

6.2.3 Compliance with Fuel Quality Limit Values

Table 6-3: Petrol Fuel Grades

Eurosuper- 95RON- Details of samples that exceed tolerance limits:					
Parameter	**Limit Value**	**Tolerance Limit* (TL)**	**Max/Min value of samples tested**	**No samples outside TL**	**% samples outside TL**
RON	95	94.6	93.9	2	0.40%
MON	85	84.5	83.9	12	0.58%
Summer Vapour Pressure, kPa	60	61.8	55.8	84	9.21%
Member State notes: Non-compliant samples for vapour pressure were due to low rotation of stocks in transition periods between winter and summer grades.					
Super+ 98RON - Details of samples that exceed tolerance limits:					
Parameter	**Limit Value**	**Tolerance Limit* (TL)**	**Max/Min value of samples tested**	**No samples outside TL**	**% samples outside TL**
Summer Vapour Pressure, kPa	60	61.8	76.6	6	8.70%
Member State notes Non-compliant samples for vapour pressure, concerning petrol, were due to low rotation of stocks in transition periods between winter and summer grades.					

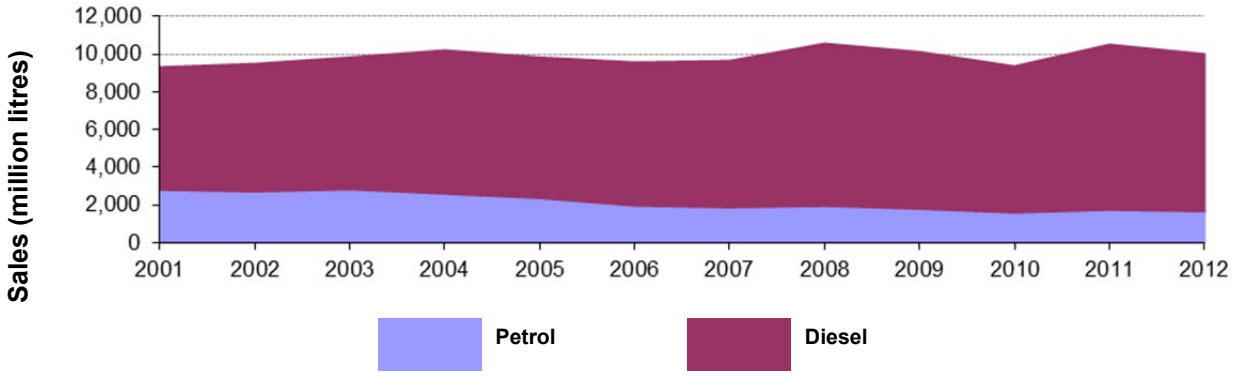
Table 6-4: Diesel Fuel Grades

Diesel - Details of samples that exceed tolerance limits:					
Parameter	**Limit Value**	**Tolerance Limit* (TL)**	**Max/Min value of samples tested**	**No samples outside TL**	**% samples outside TL**
Density at 15°C, kg/m^3	845	845.3	845	1	0.02%
Sulphur Content, mg/kg	10	11.3	29	84	0.01%
FAME Content, % V/V	7	7.53	11	17	0.03%
Member State notes: The infringements were due to involuntary contamination cause by blending					

6.3 Temporal Trends

Figure 6-2 shows the trend in total fuel sales in Belgium between 2001 and 2012. Between 2010 and 2012, both petrol and diesel sales have decreased in Belgium, by 4.2% and 4.8% respectively. In the period since 2001, petrol fuel sales have gradually declined with an overall reduction of 67.8%. Diesel fuel sales have fluctuated, but have resulted in an overall increase of 22% from 2001 to 2012.

Figure 6-2: Temporal trends in national sales of petrol and diesel (million litres)



6.4 Statistical Analysis

The following charts in this section are known as box-plots and they display the distribution of fuel characteristics per Member State by illustrating the:

- Sample minimum
- Lower 25% range
- Middle 50% range
- Median
- Upper 25% range
- Maximum

For a full explanation of the information presented in a Box Plot diagram, please see Section 4.

Fuel sampling in Belgium was undertaken in very high quantities again in 2012 and recorded some test results out of specification with limits. The analysis charts for petrol (Figure 6-3) and diesel (Figure 6-4) detail the distribution of sample results for the 5 selected parameters;

Petrol:

- Research Octane Number
- Motor Octane Number
- Summer Vapour Pressure

Diesel:

- Density at 15°C
- Distillation – 95% v/v recovered

Sample results for these parameters have been depicted using box plots based on the reported sample minimum, lower quartile (Q1), median (Q2), upper quartile (Q3), and the maximum sample value.

6.4.1 Petrol Analysis

Sample results in 2012 have been presented in the following figures with limit values for the parameter (maximum or minimum) to demonstrate the skew of sample results.

RON sample results show that the fuels available in Belgium have reasonably small variation in Octane levels, when considering the vast number of samples. MON levels do come close to the tolerance limits. Overall, a very small percentage of samples are outside octane tolerance limits.

Summer Vapour pressure results show that samples mostly fall under tolerance limits but often exceed them, mainly due to samples taken in May. Respectively 63% and 50% of infringements for Eurosuper and Super+ for vapour pressure were found in May. See Table 6-3 for further detail about non-compliant samples.

Figure 6-3: Petrol analysis

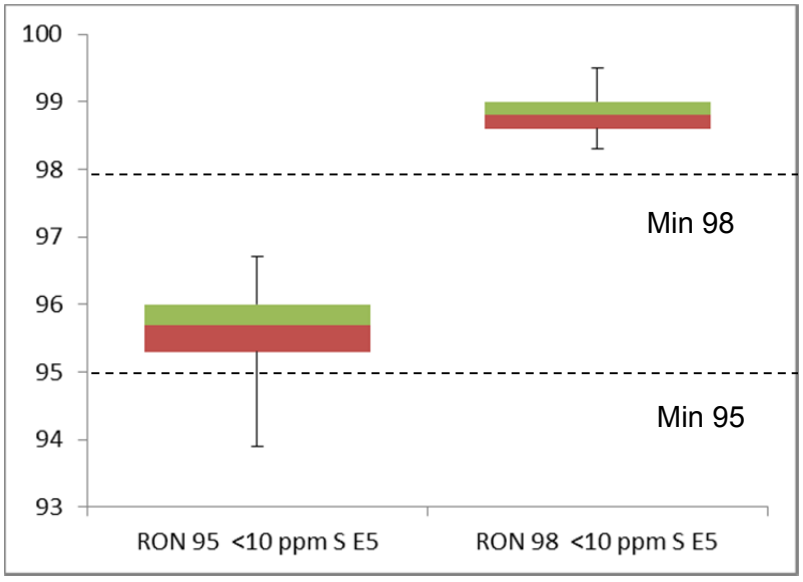
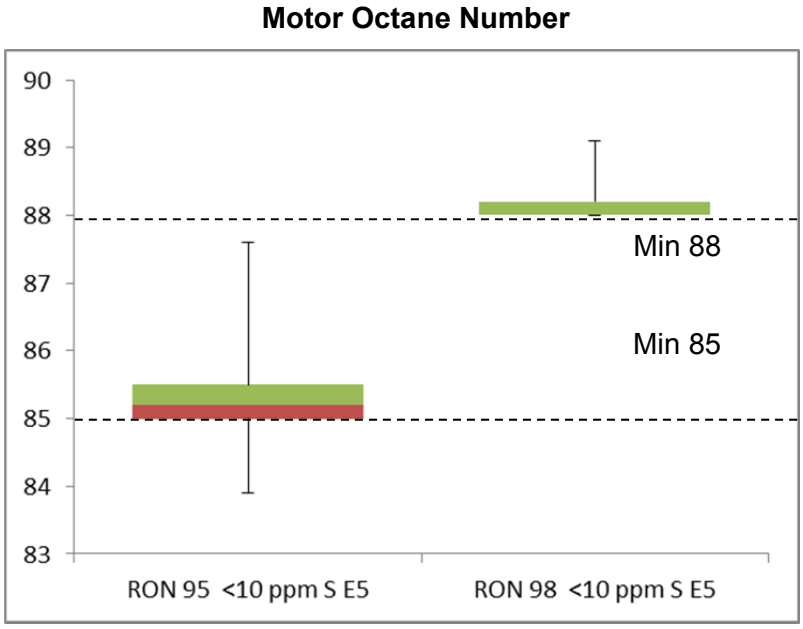
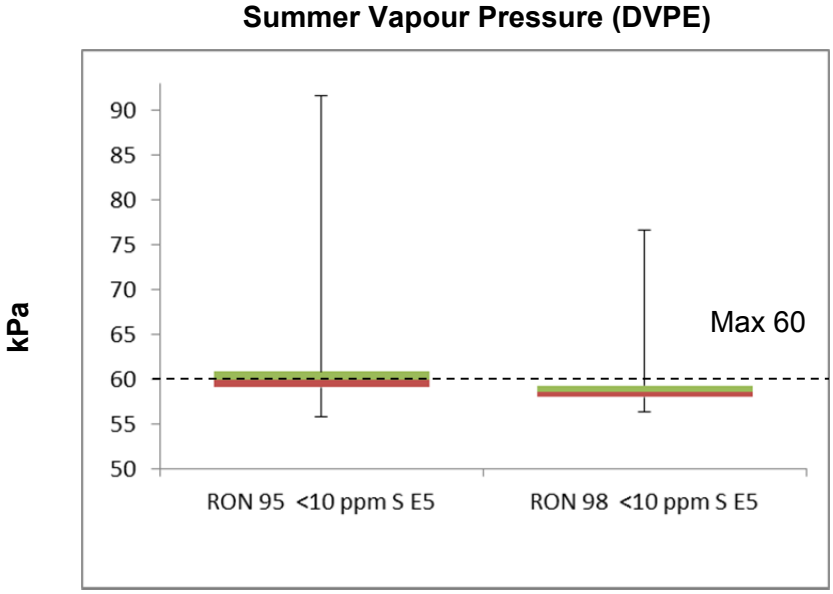


Figure 6-3: (continued)



Note: both minimum and 25% of Sample Value equal 88 for MON for fuel grade Super+ 98RON

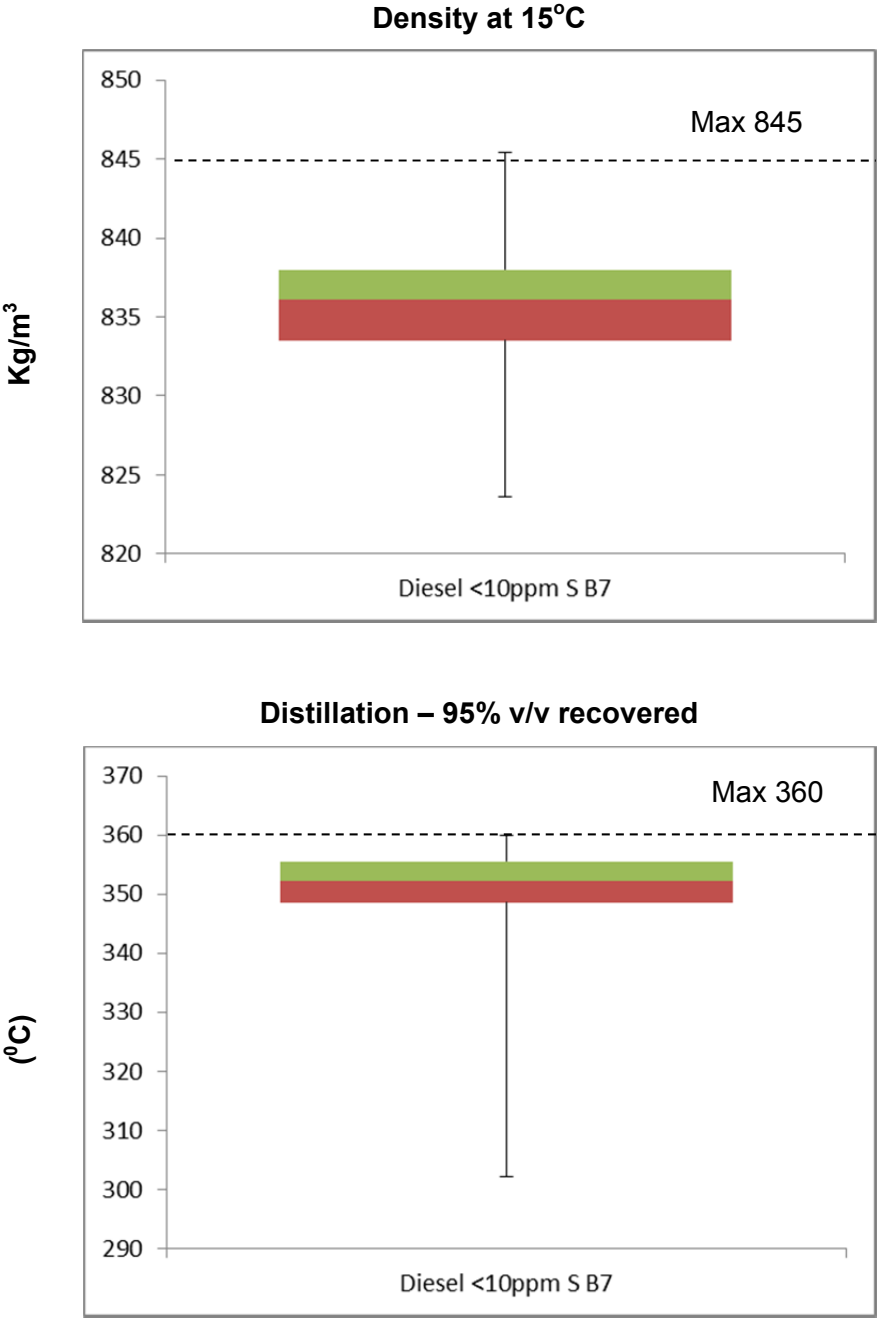


6.4.2 Diesel Analysis

Diesel sample results for Density show a relatively even distribution of results that remain fairly close to specifications.

Distillation, on the other hand demonstrates greater dispersion of test results, with the majority of sample results close to Directive specification, however significant outliers well below limit values for the parameter.

Figure 6-4: Diesel analysis



6.5 Key Areas for Improvement

The following table summarises the main areas in which improvements could be made to the monitoring system, reporting or compliance with Directive limit values. The table includes key recommendations from the previous year to give an assessment of what action has been taken by the Member State to address any issues that may have been highlighted.

Key Areas for Improvement (3 years)		
	Monitoring	**Reporting**
2012	• Monitoring requirements have been met.	• The Belgium report was received on time.
2011	• Monitoring requirements have been met as Belgium has taken samples in quantities that exceeded minimum requirements in order to demonstrate equivalence with EN 14274. • Manganese was not tested during 2011, however Belgium has confirmed that this parameter will be tested and reported for in 2012.	• The Belgian report was received on time and in the requested format.
2010	• At least one sample tested for Motor Octane Number (MON) Eurosuper-95RON was out of compliance • Belgium takes a high number of samples in comparison to other countries and the percentage of infringements is low. The percentage of infringements is very small and involuntary.	• No comment.

7 Bulgaria

7.1 Fuel Availability 2012

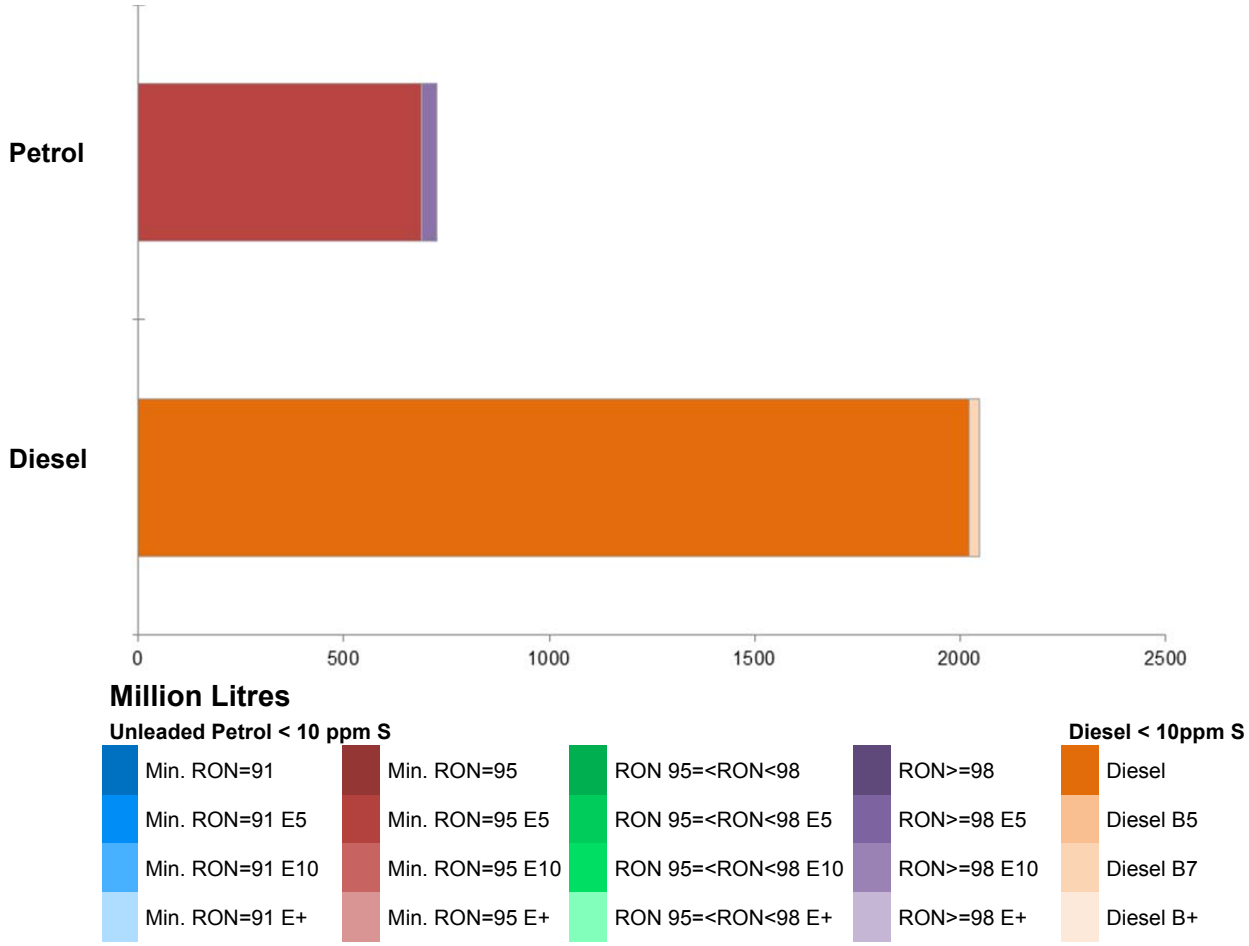
The following table lists the fuels that were reported to be available nationally in 2012.

Table 7-1: National fuel grade

Fuel grade	National fuel grade
Unleaded petrol (minimum RON = 95) E5	Unleaded petrol RON 95 E5
Unleaded petrol (minimum RON >= 98) E5	Unleaded petrol RON≥98 E5
Diesel Fuel	Diesel Fuel
Diesel Fuel B7	Diesel fuel B5

7.1.1 Sales, sampling and reporting

Figure 7-1: Fuel Sales proportions by fuel type



Bulgaria reported the sales data for 2011 and the analysis for 2012. During 2012 fuel sales in Bulgaria were dominated by diesel fuel sales; 2,049 million litres of diesel (all diesel grades combined) was sold in comparison to 727 million litres of petrol fuel sales (100% RON 95 E5).

Table 7-2: Fuel sales and sampling

Fuel type (Parent Grade)	Sales (Million litres)	Sales, % total of fuel type	Samples (1) S	Samples (1) W	Samples (1) TR (2)	Separate S/W(3)	Para-meters measured (4)	Add. Notes
Unleaded petrol min. RON=95 (<10 ppm S) E5	691	95%	234	201	100	Yes	18 of 19	(a)
Unleaded petrol (minimum RON >= 98) E5	36	5%	6	12	6	Yes	17 of 19	(b)
Total Petrol	**727**	**100%**	**240**	**213**	**106**			
Diesel (<10 ppm sulphur)	2,023	98.75%	261	235	100	Yes	6 of 6	
Diesel (<10 ppm sulphur) B7	26	1.25%	0	0	2	No	0 of 6	
Total Diesel	**2,049**	**100%**	**261**	**235**	**102**			

(1)	Samples	The actual number of samples taken by the Member State in the summer (s) and winter (w) periods
(2)	TR	Total requirement per summer and winter period according to EN 14274. Brackets () show where a national model is being used, and the requirement is indicative to demonstrate equivalence with EN14274.
(3)	Separate S & W?	Yes indicates separate summer & winter reporting, and No indicates full year sample results reporting only.
(4)	Parameters measured	Currently 19 petrol parameters should be tested and reported by the Member States and 6 diesel parameters.
(a)	Additional notes	Motor Octane Number results were not reported
(b)	Additional notes	Motor Octane Number and Manganese parameter results were not reported

7.1.1.1 Petrol Samples

- As the sales data is from 2011 it is unknown whether all fuel grades have been adequately sampled. For the sales data presented minimum requirements of sampling were adhered to.

7.1.1.2 Diesel Samples

- As the sales data is from 2011 it is unknown whether all fuel grades have been adequately sampled. For the sales data presented minimum requirements of sampling were adhered to, with exception of Diesel Fuel B7 which should have been reported on separately.

7.2 Fuel Quality Monitoring 2012

7.2.1 Description of System

Responsible organisation(s)	Ministry of Environment and Water and the State Agency for Metrological and Technical Surveillance to Ministry of Economy, Energy and Tourism.

Fuel Quality Monitoring System (FQMS)	EN 14274 Statistical model B
Country Size	Small
Summer Period	Normal
Location(s) of sampling	Sampling has been carried out at 451 locations for petrol consisting of; 428 service stations, 22 terminals and 1 refinery. Sampling has been carried out at 496 location for diesel consisting of; 473 service stations, 22 terminals and 1 refinery.
Time/frequency of sampling	Samples are taken every week with a maximum of 20 samples taken per week, from across the territory. Sampling took place every month for RON 95, but only over 8 months for RON 98. Diesel samples were taken every month.
Specification of test methods	Tests have been carried out according to the tests methods mentioned in the Directive 98/70/EC amended by Directive 2009/30/EC.
Collection of sales data	The source of fuel consumption data in 2011 is from the National Statistical Institute.

Other details

Petrol RON >= 98 is marketed in very small quantities - less than 5 % of petrol on the market. Only 8 samples of petroleum based fuels used for heating were taken because of the prominent use of gas in all heating plants and small boilers in Bulgaria. Specification of test methods: according to the tests methods mentioned in the Directive 98/70/EC amended by Directive 2009/30/EC.

Bulgarian monitoring system was introduced on 1st of October 2003 since the Clean Air Act, Law of renewable energy sources and the Regulation on liquid fuels quality and procedures and methods of their control were adopted. The Regulation implements the requirements of the Directive 98/70/EC and Directive 2009/30/EC. The latest Regulation amendment dated 2011 and according to EN 228 and EN 590 introduced two transition periods for petrol and one autumn intermediate period for diesel. Each period lasts 6 weeks. The Regulation empowers: The Directorate General “Quality control of liquid fuels” empowers SAMTS to take and test samples of liquid fuels for transport and heating purposes. The Executive Agency “Maritime Administration” to take samples from vessels and send them for testing to the accredited laboratory (49 samples were taken from ships during the period).

The Directorate General “Quality control of liquid fuels” of SAMTS consists of three regional departments for control collecting samples which are located in; Sofia, Burgas and Pleven. One department tests fuels within its own laboratory, therefore there is one stationary and two mobile departments. One department is used for control, issuing expert conclusions about the compliance/noncompliance of tested fuels. The staff of the regional control departments are spread out all over the country and are located in 7 main towns; Sofia, Plovdiv, Varna, Burgas, Pleven, Ruse and Haskovo. The Directorate General “Quality control of liquid fuels” staff perform regular control of petrol stations; by taking samples according to the scheme for monitoring the fuel quality given in EN 14274 for small size country in model B, where the country has 3 macro-regions and 7 regions. There are no geographical areas which are left outside the monitoring programme. The total number of petrol stations which are spread out all over the country is about 2232.

-Regional department for fuel quality control in Sofia is responsible for Bulgaria west (from

north to the south borders) - totally 592 petrol stations.

-Regional department for fuel quality control in Pleven is responsible for Bulgaria north – totally 759 petrol stations.

-Regional department for fuel quality control in Burgas is responsible for Bulgaria south - totally 881 petrol stations.

The marketed fuels are mainly produced by one Bulgarian refinery. Small amounts of fuels are imported from abroad. Taking into account that the distribution of petrol stations and fuel sales are similar in each macro-region and that fuels are produced mainly by one refinery, the amount of samples demanded to be taken, under the Directorate General “Quality control of liquid fuels”, in each regional department is the same. No geographical areas that are left outside the monitoring programme.

All mandatory parameters have been measured. The samples are firstly tested by stationary or mobile laboratories and then in stationary laboratory of the testing department. Equipment of mobile laboratories is mostly for express testing methods. When a mobile laboratory determines non-compliances for one or more parameters, the test is repeated in a stationary laboratory. Mobile laboratories utilize test methods as follows: Distillation by ASTM 7345, Benzene by ASTM 6277, Oxygen content and Oxygenates by ASTM 5845 and Sulphur content by ASTM 7212. To test the parameter "Cetane number" in a mobile laboratory a diesel analyser " Irox Diesel" is used. Equipment of stationary laboratories covers requirements of EN 228 and EN 590, whereas equipment to determine "Sulphur content" is to requirements of EN 20846. Further parameters, not reported in this document, are also tested; Density for Petrol and Cetane index, Viscosity, Flash point and FCPP for Diesel.

Non compliances have resulted in enforcement actions according to the; Clean Air Act, Law of renewable energy sources and Regulation on liquid fuels quality and procedures and methods of their control.

7.2.2 Fuel Quality Monitoring System

7.2.2.1 Sampling

Fuel quality control is directed by the chairman of the State Agency for Metrology and Technical Surveillance (SAMTS) under the Directorate General "Quality control of liquid fuels" (DG "QCLF"). Officials of DG "QCLF" are authorized by the President SAMTS to take samples, test them and report the results.

The control of fuels used in sea areas and inland waterways is carried out by Executive Director of the Executive Agency "Maritime Administration" officials.

The officials of DG "QCLF" inspect fuel oil in storage tanks at; commercial and industrial facilities, oil depots and terminals, and at refuelling stations (from nozzles). Portable tanks for the carriage of liquid fuels are also tested.

Frequency of sampling is; every week, twenty samples per week max not more than 1000 samples per year. The places of sampling are fixed using software for randomised selection or after receiving signal in SAMST or DG “QCLF” for fuel which is out of fuel quality requirements.

Bulgaria legislation is adopted with Directive 98/70/EC amended by Directive 2009/30/EC, Directive 2009/28/EC and Directive 1999/32/EC. Fuel quality monitoring model is for small country statistical model “B” according EN 14274. The minimum number of samples each period is 100 for petrol and diesel, where number of samples for petrol is sum from RON 95 and RON >= 98.

Mobile laboratory utilize test methods as follows: Distillation according to ASTM D 7345, Benzene according to ASTM D 6277, Oxygen content and Oxygenates according to ASTM D

5845 and Sulphur content according to ASTM D 7212. Test of the parameter "Cetane number" is done in mobile laboratory with the help of diesel analyser "Irox Diesel". Equipment of stationary department covers requirements of EN 228 and EN 590 and permit to apply test methods as follow: for petrol RON according to EN ISO 5164, Lead content according to EN 237, Density at 15 °C according to EN ISO 12185 and EN ISO 3675, Sulphur content according to EN ISO 20846, Oxidation stability according to EN ISO 7536, Copper strip corrosion according to EN ISO 2160, Hydrocarbon content - Alkenes and Arenes according to EN 15553, Benzene according to EN 238 + A1 and EN 12177 + AC, Oxygen content and Oxygenates according to EN 13132, Vapour pressure according to EN 13016 – 1, Distillation according to EN ISO 3405, Manganese according to EN 16135 and EN 16136 and for diesel "Cetane number" is according EN 15195 for “Delivered cetan number” instead of engine according to EN 5165, Cetane index according to EN ISO 4264, Density at 15 °C according to EN ISO 12185 and EN ISO 3675, Polycyclic aromatic hydrocarbons according to EN 12916, Sulphur content according to EN ISO 20846, Flash point according to EN ISO 2719, Carbon residue (on 10% distillation residue) according to EN ISO 10370, Ash content according to EN ISO 6245, Water content according to EN ISO 12937, Total impurities according to EN 12662, Copper strip corrosion according to EN ISO 2160, Crushing capacity according to EN ISO 12156 – 1, Viscosity at 40 °C according to EN ISO 3104 + AC, Distillation according to EN ISO 3405, Cold filter plugging point according to EN 116 + AC and Content of methyl esters of fatty acids according to EN 14078.

7.2.2.2 FQMS Administration

The Ministry of Environment and Water and State Agency for Metrological and Technical Surveillance (STATS) of the Directorate General "Quality Control of Liquid Fuels" (DG QCLF), manage and implement requirements of the FQM Directive.

The control is done through checks on; the information for the marketing fuel, inspection of documents accompanying liquid fuels, the sampling of liquid fuels and testing of samples, the examination of the test results for compliance with requirements for fuel quality, and imposition of administrative measures.

Directorate General "Quality Control of Liquid Fuels" is a public body responsible for taking action where non-compliance samples are discovered. Every month, every three months, and every year, DG QCLF report on the sites of SAMST data;, the number of non-compliance, and the number and kind of imposition administrative measures which have been taken during the period of report.

Bulgarian refinery is “Lukoil” in Burgas. There is pipe line from this refinery to Sofia. The pipe line is connected with terminals in Karnobat, Stara Zagora, Plovdiv, Ihtiman and Sofia. Outside of this there are more than 10 other big terminals – six of them are in north of Bulgaria and five in south of Bulgaria. The owners of these terminals are “Lukoil”, “Naftex Petrol”, OMV, “Rompetrol”.

Bulgaria provides annual Fuel Quality Monitoring data report up to 30th of June.

7.2.2.3 National Legislation that Transposed the FQD

European fuel quality legislation is transposed in Bulgarian legislation by procedures and methods of fuel control imposed by the; Clean Air Act, Law of renewable energy sources and the Regulation on liquid fuels and methods of their control. The Clean Air Act and the Regulation on liquid fuels quality requires testing of fuels to EN 228 and EN 590 standards. The law of renewable energy sources impose minimum requirements for blending bio and fossil fuels. According article 47 of Law of renewable energy sources terminals are obliged to blend fossil diesel with minimum 5 % biodiesel from 1st of January and minimum 6 % from 1st of June. The same article 47 order terminals to blend petrol with minimum 2 % bioethanol or ethers produced from bioethanol from 1st of June. Two months later these rates of blending are in force for refuelling stations.

7.2.2.4 Reporting Periods

The summer period in Bulgaria lasts from 16th of April to 15th of October. The rest of the year is winter period; from 16th of October to 15th of April. No "Arctic" derogation has been granted for Bulgaria.

The last amendment of Regulation on liquid fuels quality and procedures and methods of their control in 2011, introduced two transition periods for petrol and one autumn intermediate period for diesel. Each period lasts 6 weeks. Winter – summer transition period for petrol begin on 16th of April and finish on 31st of May. Summer – winter transition period for petrol and intermediate autumn period for diesel begin on 16th of October and finish on 30th of November.

Samples during the transitions and intermediate period are taken and tested with the same frequency as the rest of the year. All results of samples taken during transitions and intermediate periods are reported within annual fuel quality report but there are no sanctions for the exceeded values in them for "Vapour pressure" and "Cold filter plugging point".

7.2.3 Compliance with Fuel Quality Limit Values

Table 7-3: Petrol Fuel Grades

RON 95 Petrol - Details of samples that exceed tolerance limits:					
Parameter	**Limit Value**	**Tolerance Limit* (TL)**	**Max/Min value of samples tested**	**No samples outside TL**	**% samples outside TL**
RON	95	94.6	92.8	2	0.46%
Summer vapour pressure, kPa	60	61.8	61.4	1	0.40%
Distillation at 100°C	46	43.6	42.6	2	0.42
Benzene, % v/v	1.0	1.1	2.2	1	0.24%
Sulphur content, mg/kg	10	11.6	50	3	0.67%
Member State notes The conclusions of compliance/noncompliance have been given over the stationary laboratory results. All non-compliances except ethanol resulted in a penalty fine of 10,000 lv per sample which exceeded tolerance limits, for ethanol non-compliant samples a fine of 50,000 lv was imposed per sample.					
RON 95 ≤ RON <98 Petrol - Details of samples that exceed tolerance limits:					
No non-compliances.					
RON 98 Petrol - Details of samples that exceed tolerance limits:					
No non-compliances.					

Table 7-4: Diesel Fuel Grades

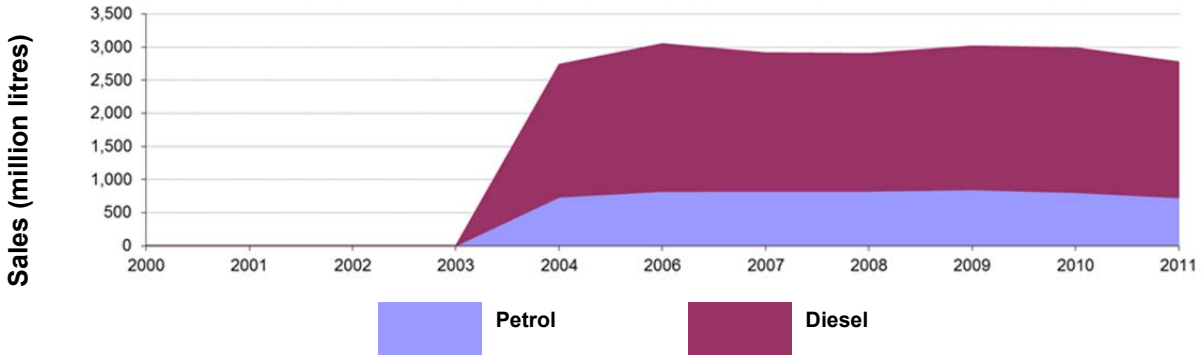
Diesel - Details of samples that exceed tolerance limits:					
Parameter	**Limit Value**	**Tolerance Limit* (TL)**	**Max/Min value of samples tested**	**No samples outside TL**	**% samples outside TL**
Distillation – 95-%-Point, °C	360	365.9	369	1	0.20%
Sulphur content, mg/kg	10	11.3	50	20	3.90%
FAME Content	7	7.3	7	11	2.71%

Member State notes
The conclusions of compliance/noncompliance have been given over the stationary laboratory results. For Distillation and Sulphur non-compliant samples a penalty fine of 10,000 lv per sample was imposed, for FAME non-compliant samples a fine of 50,000 lv was imposed per sample.

7.3 Temporal Trends

Figure 7-2 shows the overall trend in total fuel sales for Bulgaria from 2005 since Bulgaria began reporting under the FQM Directive. Between 2005 and 2012 diesel sales have decreased by 10 million litres (1.3%), whilst petrol sales have increased by 47 million litres (2.3%). Between 2011 and 2012 diesel sales have decreased by 135 million litres (6.2%), whilst petrol sales have decreased by 78 million litres (9.7%).

Figure 7-2: Temporal trends in national sales of petrol and diesel (million litres)



7.4 Statistical Analysis

The following charts in this section are known as box-plots and they display the distribution of fuel characteristics per Member State by illustrating the:

- Sample minimum
- Lower 25% range
- Middle 50% range
- Median
- Upper 25% range
- Maximum

For a full explanation of the information presented in a Box Plot diagram, please see section 4.

Fuel sampling in Bulgaria in 2012 recorded a number of test results found to be out of specification with limit values. Insufficient data has been provided for the analysis of unleaded petrol (minimum RON >= 98) E5, therefore petrol analysis is restricted to RON 95; will only analysis of RON and DVPE.

The analysis charts for petrol (Figure 7-3) and diesel (Figure 7-4) detail the distribution of sample results for the 5 selected parameters:

Petrol:

- Research Octane Number
- Motor Octane Number
- Summer Vapour Pressure

Diesel:

- Density at 15°C
- Distillation – 95% v/v recovered

Sample results for these parameters have been depicted using box plots based on the reported sample minimum, lower quartile (Q1), median (Q2), upper quartile (Q3), and the maximum sample value.

7.4.1 Petrol Analysis

Sample results in 2012 have been presented in the following figures with limit values for the parameter (maximum or minimum) to demonstrate the skew of sample results. RON sample results show that RON 95 has a reasonably small variation in Octane and summer vapour levels.

The majority of samples from RON 95 for octane are away from the tolerance limits, with only a few samples exceeding tolerance levels. Summer vapour pressure analysis reveals a distribution of RON 95 samples near to the tolerance limits with only a few outliers.

Figure 7-3: Petrol analysis

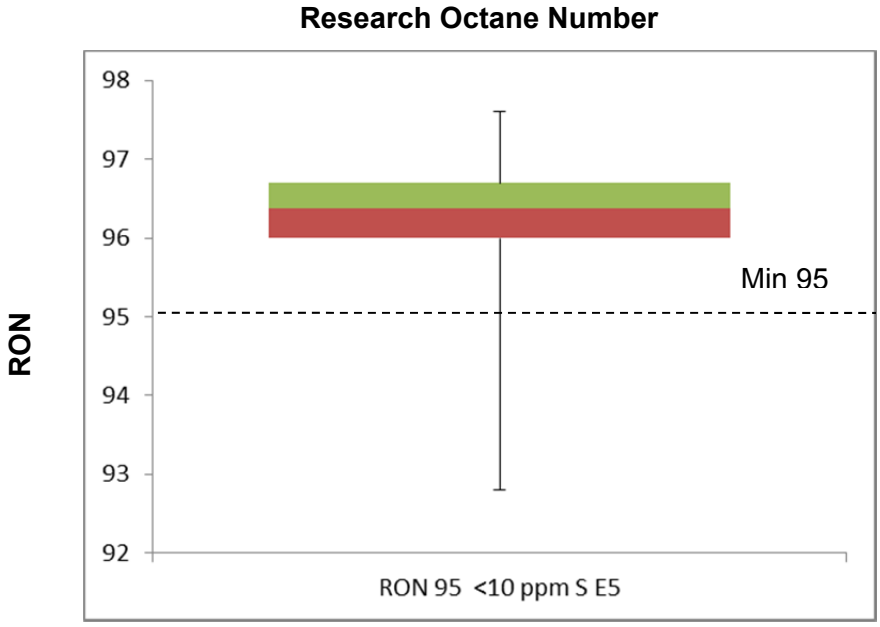
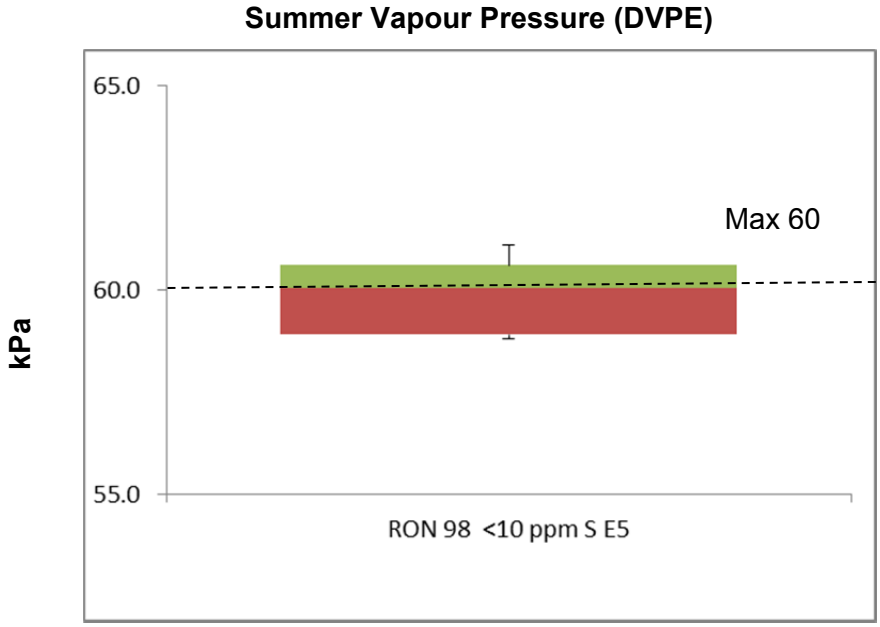


Figure 7-3: Petrol analysis (continued)



7.4.2 Diesel Analysis

Diesel sample results show a slightly wider variation in density (exhibited by the widely spread coloured bands at the 25 and 75 quartile), whilst there is a tight distribution of distillation sample results. Both density and distillation distributions are away from the tolerance limits with only outlying samples exceeding tolerance limits.

Figure 7-4: Diesel analysis

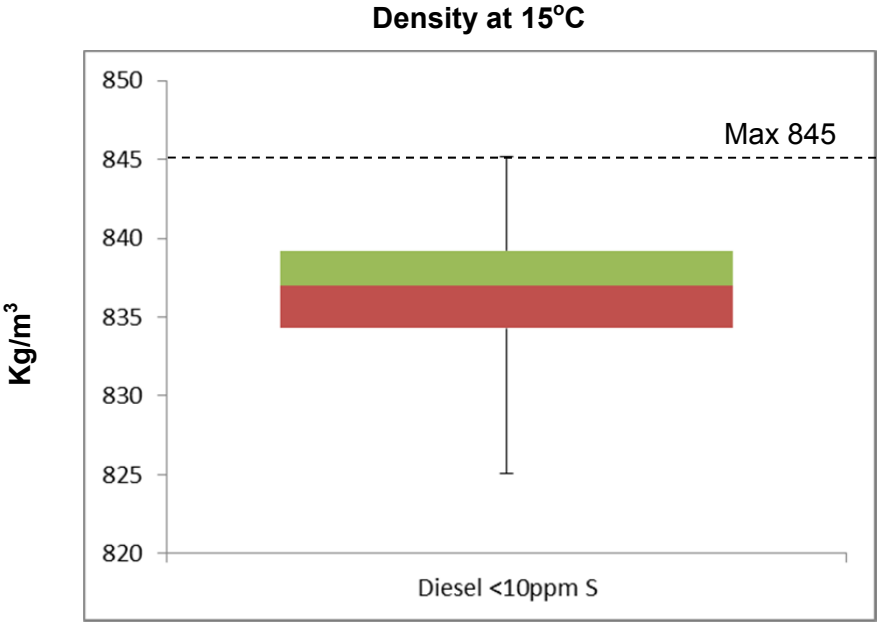
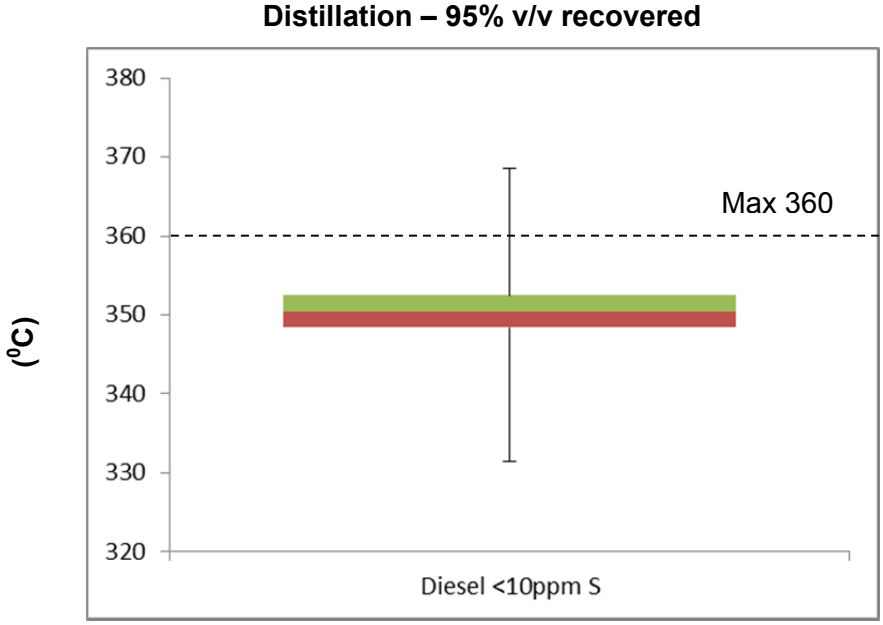


Figure 7-4: Diesel analysis (continued)



7.5 Key Areas for Improvement

The following table summarises the main areas in which improvements could be made to the monitoring system, reporting or compliance with Directive limit values. The table includes key recommendations from the previous year to give an assessment of what action has been taken by the Member State to address any issues that may have been highlighted.

Key Areas for Improvement (3 years)		
	Monitoring	**Reporting**
2012	• Sales data for 2011 was provided with the statistical analysis for fuels used in 2012. This approach restricts analysis. Sales data have to be reported by 30th June for the preceding year. • Details of samples of Diesel B7 were not reported, which is required.	• Statistical data for all petrol fuel grades will improve future reports. • The report was received on the 28th June, before the 30 June deadline.
2011	• Bulgaria did not report parameter results for MON and Manganese for petrol fuel grades, Unleaded petrol min. RON=95 (<10 ppm S) E5 and Unleaded petrol RON>=98 (<10 ppm S) E5 or for MON, Olefins, Aromatics, Lead and Manganese for petrol fuel grade, Unleaded petrol 95=<RON<98 (<10 ppm S) E5. • The statistical analysis information provided was incomplete and had some inconsistencies. Though this	• The 2011 report was submitted on time.

Key Areas for Improvement (3 years)		
	Monitoring	**Reporting**
	is not a mandatory reporting requirement, if the data are routinely collected then they could be supplied for all grades. • Bulgaria has not provided fuel sales split by fuel grades.	
2010	• Fuel sales data is not available for reporting year 2010 and sales data for 2009 has been provided instead. • 2010 diesel sales figures include international shipping fuels. • Regional sales volumes have not been provided for Petrol or Diesel – sample distribution has been provided, however sales have not.	• Bulgaria has not submitted full sales data per petrol grade – this is a requirement outlined in EN 14274. • Additional detail could have been provided in relation to the Fuel Quality Monitoring System for 2010. • Not all parameters for the petrol grades were reported – particularly MON where no samples were taken for any of the petrol grades.

8 Cyprus

8.1 Fuel Availability 2012

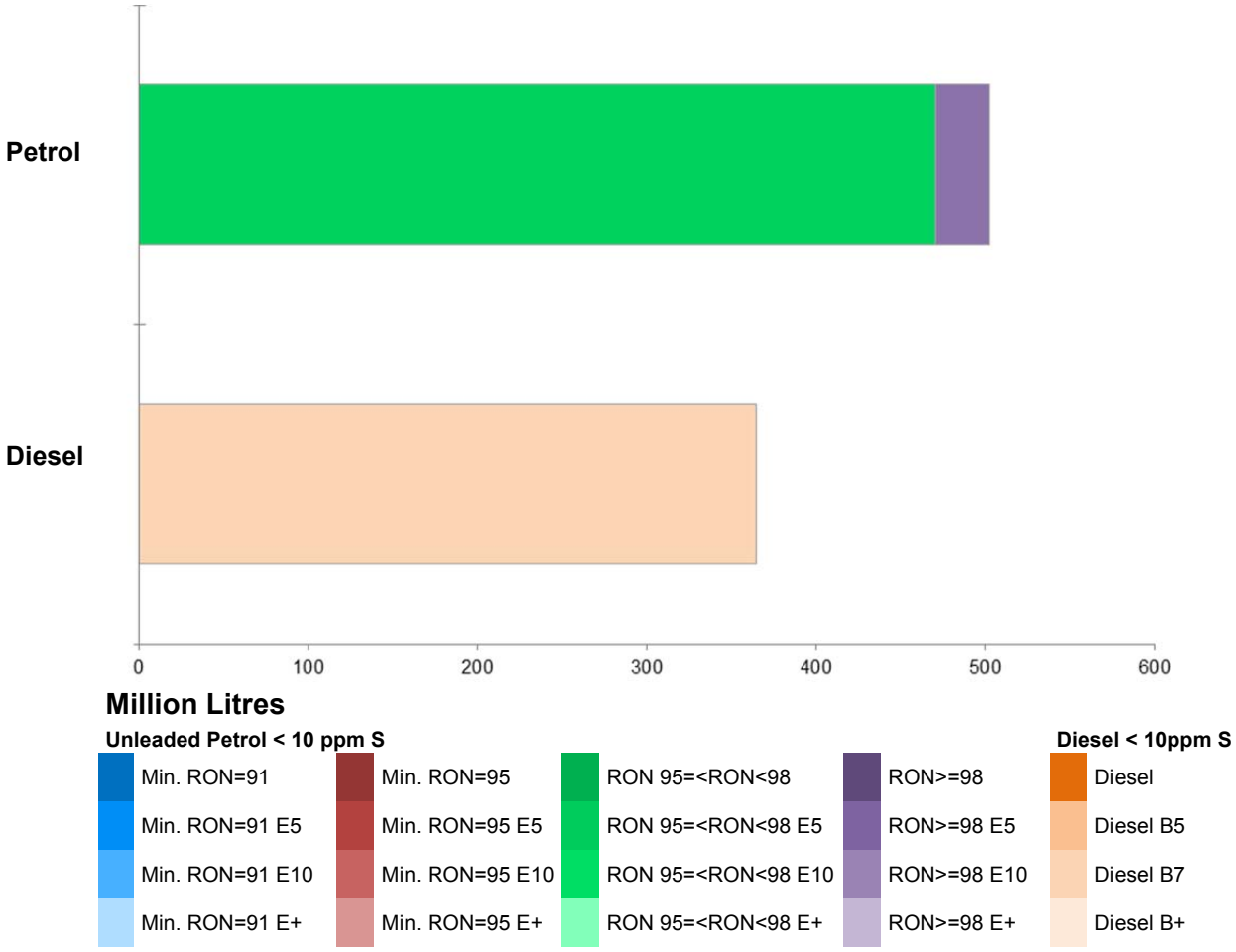
The following table lists the fuels that were reported to be available nationally in 2012.

Table 8-1: National fuel grade

Fuel grade	National fuel grade
Unleaded petrol (minimum RON = 95)	Unleaded Petrol 95
Unleaded petrol (minimum RON >= 98)	Unleaded Petrol 98
Diesel fuel B7	Eurodiesel

8.1.1 Sales, sampling and reporting

Figure 8-1: Fuel Sales proportions by fuel type



During 2012 fuel sales in Cyprus were dominated by petrol fuel sales, which is in stark contrast to the other Member States who report fuel sales dominated by diesel sales. Over 502 million litres of petrol fuel sales (all petrol grades combined) was sold in comparison to 365 million litres of diesel fuel sales. Petrol fuel sales were mainly comprised of fuel grade unleaded petrol (minimum RON = 95).

Table 8-2: Fuel sales and sampling

Fuel type (Parent Grade)	Sales (Million litres)	Sales, % total of fuel type	Samples (1) S	Samples (1) W	Samples (1) TR (2)	Separate S/W(3)	Para-meters measured (4)	Add. Notes
Unleaded petrol min. RON=95 (<10 ppm S)	471	93.73%	86	85	50	Yes	17 of 19	(a)
Unleaded petrol RON>=98 (<10 ppm S)	31	6.27%	74	83	4	Yes	17 of 19	(a)
Total Petrol	**502**	**100.00%**	**160**	**168**	**54**	**Yes**	**17 of 19**	
Diesel (<10 ppm sulphur) B7	365	100.00%	81	92	50	Yes	6 of 6	
Total Diesel	**365**	**100.00%**	**81**	**92**	**50**	**Yes**	**6 of 6**	

(1)	Samples	The actual number of samples taken by the Member State in the summer (s) and winter (w) periods
(2)	TR	Total requirement per summer and winter period according to EN 14274. Brackets () show where a national model is being used, and the requirement is indicative to demonstrate equivalence with EN14274.
(3)	Separate S & W?	Yes indicates separate summer & winter reporting, and No indicates full year sample results reporting only.
(4)	Parameters measured	Currently 19 petrol parameters should be tested and reported by the Member State and 6 diesel parameters.
(a)	Additional notes	Parameter results for manganese and Iso-butyl alcohol parameters have not been provided for either petrol fuel grades in 2012. Biofuel is not added to petrol fuel grades 95 and 98.

8.1.1.1 Petrol Samples

- Cyprus has exceeded minimum sampling requirements for all petrol fuel grades.

8.1.1.2 Diesel Samples

- Diesel fuel samples have exceeded the minimum requirement for a small country monitoring and reporting using EN14274 statistical model C which requires 50 samples to be taken per fuel per period.

8.2 Fuel Quality Monitoring 2012

8.2.1 Description of System

Responsible organisation(s)	Energy Service, Ministry of Energy, Commerce, Industry and Tourism
Fuel Quality Monitoring System (FQMS)	EN 14274 Statistical model C
Country Size	Small
Summer Period	Normal
Location(s) of sampling	Samples of all fuel grades were taken from; petrol stations, the depot at Larnaca, CPSC farm, cars and other private installations of large consumers, by the inspectors of the Energy Service. The number of samples taken from the Larnaca depot was determined by the number of petroleum shipments imported. All petroleum products held by the CPSC were tested in order to secure their compliance with the EU specifications. However, only samples from retail sites are included in the statistical and analytical results of the 2012 FQMS Report. The Mobile Lab of the Energy Service carried out almost all the tests required for monitoring the fuel quality for 2012, at the petrol stations. The Laboratory of the CPSC conducted only a limited number of tests, especially for verification reasons.
Time/frequency of sampling	Samples have been taken in every month throughout 2012
Specification of test methods	The necessary tests for monitoring the quality of fuels, stored either in installations or at petrol stations, were conducted by the Mobile Lab of the Energy Service of the Ministry of Energy, Commerce, Industry and Tourism. The Energy Service, since May 2007, owns a mobile lab for performing all the necessary tests for monitoring the fuel quality of fuels marketed Cyprus. The Mobile Lab, consists of 8 fully automatic analysers that can define most of the main parameters of diesel, petrol, kerosene gasoil, jet fuel, marine and fuel oil. The Mobile Lab is in the process of being an accredited fuel laboratory, based on the CYS EN ESO/IEC 17025:2005 standard.
Collection of sales data	The sales data for 2012 has been provided for Summer and Winter. The sales data is also available for the full year.

Other details

Other parameters for diesel and petrol have also been measured but not reported. For example; water content, distillation at 250 and 350oC, CFPP point and cetane index, are also measured for every diesel sample. Furthermore, parameters like distillation at 70^{o}C, FBP and residue are also measured for every petrol sample.

The fuel grade Unleaded Petrol RON>100 was also marketed in Cyprus but in very small quantities (1.689 MT), so no results for these tests are reported.

Neither the Minister laboratories in Cyprus, the Mobile Lab or the CPSC lab, have the necessary equipment for measuring manganese concentration in petrol samples. This fact has already been stated by Cyprus representative, during the 6th and 7th meeting of the Fuel Quality Committee.

The summer period is from 16/4-15/10 and winter period from 16/10-15/4. Transition period from summer to winter and vice versa is set to 6 weeks. Some of the vapour pressure measurements appear to be out of specifications, but this is only because the measurements of these samples were within the transition period.

8.2.2 Fuel Quality Monitoring System

8.2.2.1 Sampling

Samples of all fuel grades were taken from; petrol stations, the depot at Larnaca, CPSC farm, cars and other private installations of large consumers, by the inspectors of the Energy Service on a daily basis. The number of samples taken from the Larnaca depot was determined by the number of petroleum shipments imported. All petroleum products held by the CPSC were tested in order to secure their compliance with EU specifications. Only samples from retail sites are included in the statistical and analytical results of the 2012 FQMS Report. The Mobile Lab of the Energy Service carried out almost all the tests required for monitoring the fuel quality for 2012, at the petrol stations. The Laboratory of the CPSC conducted only a limited number of tests especially for verification reasons.

8.2.2.2 FQMS administration

The Energy Service of the Ministry of Energy, Commerce, Industry and Tourism is the competent authority for monitoring the quality of fuels marketed in the government-controlled area of Cyprus. Retail site (petrol stations) samples were taken by the inspectors of the Energy Service on a daily surveillance program prepared by the Chief Inspector and/or his Assistant. Where non-compliant samples are discovered, the Chief Inspector (who is appointed by the Minister of Commerce, Industry and Tourism) is responsible for; forbidding the sale of off-specification fuels from retail sites, the use of off-specification fuels from private installations, and the penal prosecution of the person who is responsible for the tank. Cyprus is considered as a single region and the supply, distribution and retail of petroleum products are carried out only by the four marketing companies, which utilize a single depot. Cyprus has no refinery.

8.2.2.3 National Legislation that transposed the FQD

The provision of the Fuel Quality Directive that correlate with the fuel specifications has been transported to national law by the Decrees K.D.P. 442/2011 and K.D.P. 330/2012.

8.2.2.4 Reporting periods

Summer period is from 16/4-15/10 and winter period from 16/10-14/4. Transition period from summer to winter, and vice versa, is set to 6 weeks. Samples are taken and tested during the transition period. The modifications of vapour pressure within the transition period is monitored (if the results are gradually complied with the seasonal specifications) and reported within the annual fuel quality report.

8.2.3 Compliance with Fuel Quality Limit Values

Table 8-3: Petrol Fuel Grades

RON 95 Petrol - Details of samples that exceed tolerance limits:					
Parameter	**Limit Value**	**Tolerance Limit* (TL)**	**Max/Min value of samples tested**	**No samples outside TL**	**% samples outside TL**
Summer vapour pressure, kPa	60	61.8	67.2	15	17.86%
Member State notes Summer vapour sample results found to be out of specification with tolerance limits were due to transition period from winter to summer (6 weeks).					

RON 98 Petrol - Details of samples that exceed tolerance limits:					
Parameter	**Limit Value**	**Tolerance Limit* (TL)**	**Max/Min value of samples tested**	**No samples outside TL**	**% samples outside TL**
Summer vapour pressure, kPa	60	61.8	65.7	14	20%
Member State notes Summer vapour sample results found to be out of specification with tolerance limits were due to transition period from winter to summer (6 weeks).					

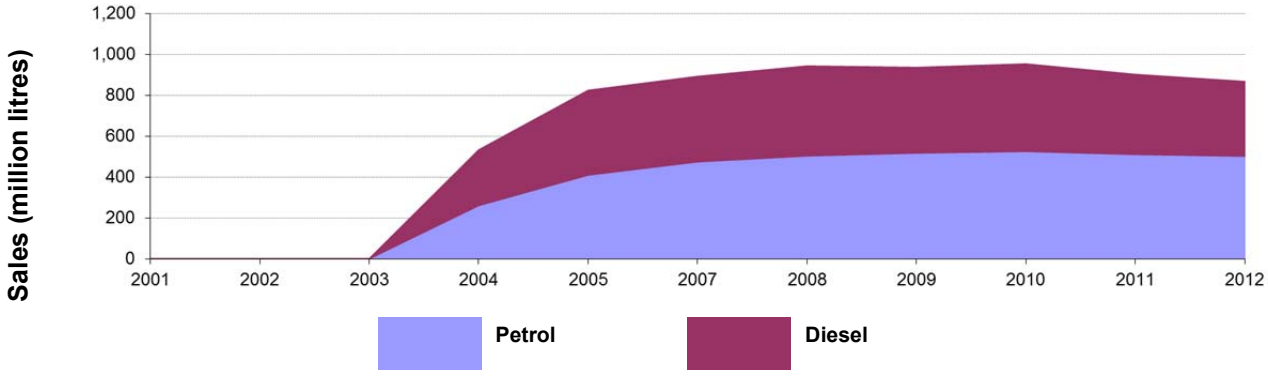
Table 8-4: Diesel Fuel Grades

Diesel - Details of samples that exceed tolerance limits:					
Parameter	**Limit Value**	**Tolerance Limit* (TL)**	**Max/Min value of samples tested**	**No samples outside TL**	**% samples outside TL**
Member State notes No samples exceeded tolerance limits.					

8.3 Temporal Trends

Figure 8-2 shows the overall trend in total fuel sales for Cyprus since 2004. Diesel sales in Cyprus have decreased by 26 million litres (6.8%) between 2011 and 2012. There is however, an overall increase in diesel sales of 25.5% in the period 2004-2012. Petrol sales have also decreased in the reporting year, with 8 million litres (1.6%) less petrol fuels sold in 2012 compared to 2011. Like diesel, there has also been an overall increase since reporting started in 2004, with 48.1% more petrol fuel sold in 2012.

Figure 8-2: Temporal trends in national sales of petrol and diesel (million litres)



8.4 Statistical Analysis

The following charts in this section are known as box-plots and they display the distribution of fuel characteristics per Member State by illustrating the:

- Sample minimum
- Lower 25% range
- Middle 50% range
- Median
- Upper 25% range
- Maximum

For a full explanation of the information presented in a Box Plot diagram, please see Section 4.

Fuel sampling in Cyprus in 2011 recorded several test results out of specification with limits. The analysis charts for petrol (Figure 8-3) and diesel (Figure 8-4) detail the distribution of sample results for the 5 selected parameters;

Petrol:

- Research Octane Number
- Motor Octane Number
- Summer Vapour Pressure

Diesel:

- Density at 15^{o}C
- Distillation – 95% v/v recovered

Sample results for these parameters have been depicted using box plots based on the reported sample minimum, lower quartile (Q1), median (Q2), upper quartile (Q3), and the maximum sample value.

8.4.1 Petrol Analysis

Sample results in 2012 have been presented in the following figures with limit values for the parameter (maximum or minimum) to demonstrate the skew of sample results. RON and MON sample results show that the fuels available in Cyprus have reasonably small variation in Octane levels. Summer Vapour pressure results shows that the samples were found to be exceeding limit values and the majority of samples skewed closer to the limit with a wider variation.

Figure 8-3: Petrol analysis

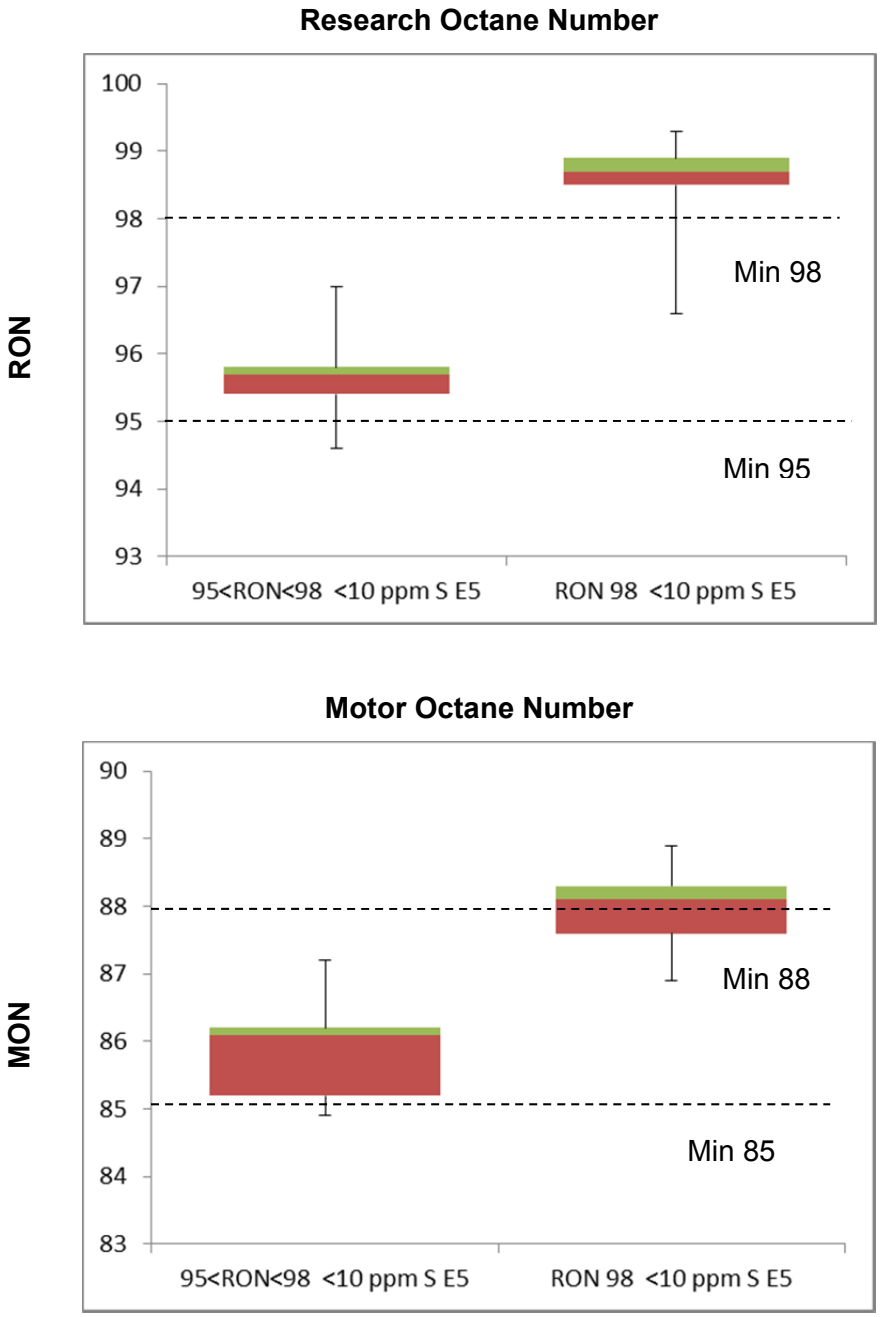
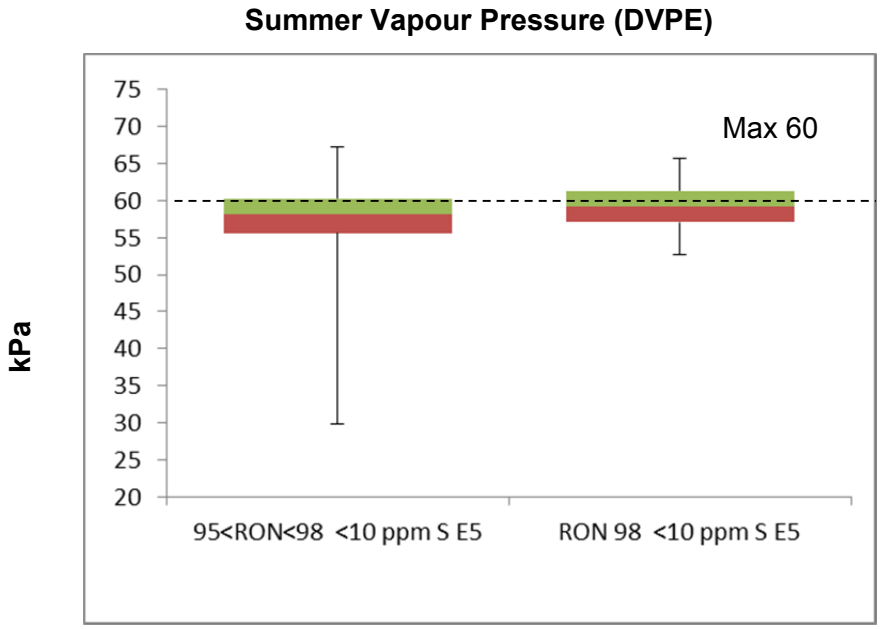


Figure 8-3: (continued)



8.4.2 Diesel Analysis

Figure 8-4: Diesel analysis

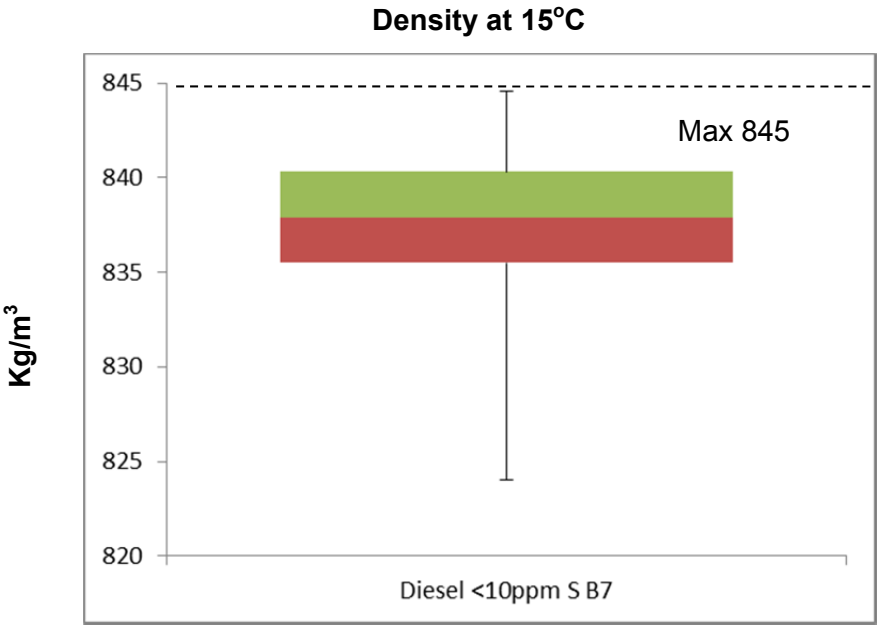
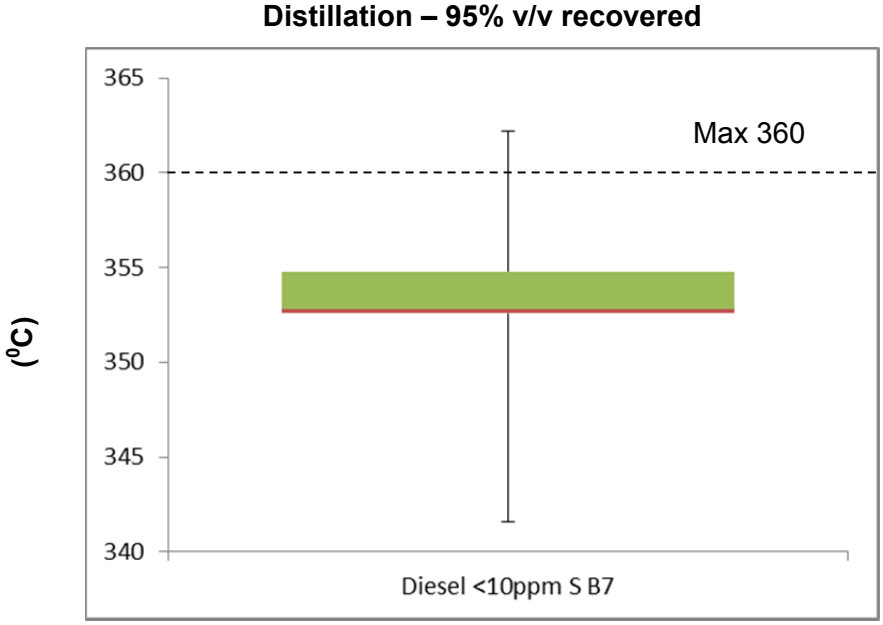


Figure 8-4: Diesel analysis (continued)



8.5 Key Areas for Improvement

The following table summarises the main areas in which improvements could be made to the monitoring system, reporting or compliance with Directive limit values. The table includes key recommendations from the previous year to give an assessment of what action has been taken by the Member State to address any issues that may have been highlighted.

Key Areas for Improvement (3 years)		
	Monitoring	**Reporting**
2012	• Cyprus did not report parameter results for manganese and Iso-butyl alcohol for either petrol fuel grades in 2012.	The 2012 report was received on time.
2011	• Summer Vapour pressure results show that the samples were found to be exceeding limit values. • For fuel grade, Unleaded petrol min. RON=95 (<10 ppm S), there is an uneven split between summer and winter samples which meant that winter samples did not meet the minimum requirement under EN 14274. • Cyprus did not report parameter results for manganese and Iso-butyl alcohol for either petrol fuel grades in 2011.	The 2011 report was received on time.
2010	• Cyprus has reported sales of RON 100 with less than 1% market share,	The 2010 report was submitted almost one full month after the 30th

Key Areas for Improvement (3 years)	
Monitoring	**Reporting**
however have provided no sample results. EN 14274 section 5.4.2 states that where the minimum sample required is found to be less than 1 – then at least one sample of that fuel grade should be taken.	June annual Member State reporting deadline arriving on the 28th July. Parameter results should be reported in the units of measurement provided (as per Directive specification). Testing conducted during the transition period between summer and winter should not be reported in the summer data set unless these were conducted within the regulated summer period (between 1 May and 30 September).

9 Czech Republic

9.1 Fuel Availability 2012

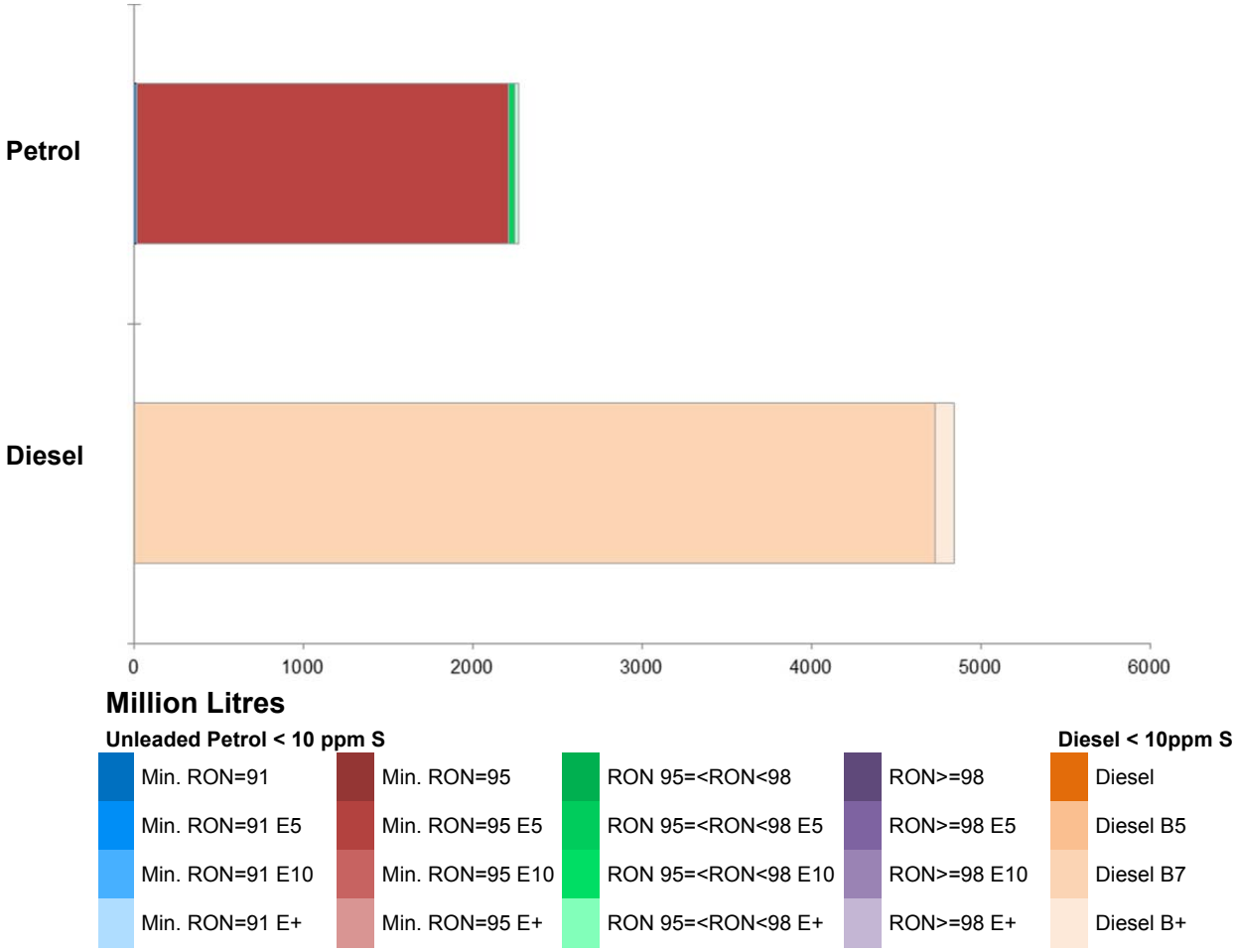
The following table lists the fuels that were reported to be available nationally in 2011.

Table 9-1: National fuel grade

Fuel grade	National fuel grade
Regular unleaded petrol (minimum RON = 91) E5	Special BA-91 E5
Unleaded petrol (minimum RON = 95) E5	Super BA-95 E5
Unleaded petrol (minimum RON >= 98) E5	Super Plus BA-98 E5
Unleaded petrol (minimum 95 =< RON < 98) E+2	E85
Diesel fuel (<10 ppm sulphur) B7	Motorová nafta B7
Diesel fuel (<10 ppm sulphur) B+	Smesna motorova nafta

9.1.1 Sales, sampling and reporting

Figure 9-1: Fuel Sales proportions by fuel type



During 2012, fuel sales in the Czech Republic were dominated by diesel fuel. More than 4,800 million litres of diesel were sold (all diesel grades combined) in comparison to less than 2,300 million litres of petrol (all petrol grades combined). Petrol fuel sales were mainly represented (96.5%) by fuel grade RON 95 with up to 5% biofuel content. In diesel fuel sales prevailed (97.2%) of the grade with up to 7% biofuel content.

Table 9-2: Fuel sales and sampling

Fuel type (Parent Grade)	Sales (Million litres)	Sales, % total of fuel type	Samples (1) S	Samples (1) W	Samples (1) TR (2)	Separate S/W(3)	Parameters measured (4)	Add. Notes
Unleaded petrol min. RON=91 (<10 ppm S) E5	16	0.71%	7	11	1	Yes	19 of 19	
Unleaded petrol min. RON=95 (<10 ppm S) E5	2,195	96.55%	495	713	50	Yes	19 of 19	
Unleaded petrol 95=<RON<98 (<10 ppm S) E5	41	1.79%	16	32	1	Yes	19 of 19	
Unleaded petrol 95=<RON<98 (<10 ppm S) E+	22	0.95%	7	12	1	Yes	5 of 19	(a)
Total Petrol	**2,274**	**100.00%**	**525**	**768**	**53**	**Yes**		
Diesel (<10 ppm sulphur) B7	4,728	97.55%	570	843	50	Yes	6 of 6	
Diesel (<10 ppm sulphur) B+	119	2.45%	21	34	2	Yes	5 of 6	(b)
Total Diesel	**4,847**	**100.00%**	**591**	**877**	**52**	**Yes**		

(1)	Samples	The actual number of samples taken by the Member State in the summer (s) and winter (w) periods
(2)	TR	Total requirement per summer and winter period according to EN 14274. Brackets () show where a national model is being used, and the requirement is indicative to demonstrate equivalence with EN14274.
(3)	Separate S & W?	Yes indicates separate summer & winter reporting, and No indicates full year sample results reporting only.
(4)	Parameters measured	Currently 19 petrol parameters should be tested and reported by the Member States and 6 diesel parameters.
(a)	Additional notes	Only Vapour Pressure, Methanol, Ethanol, Ethers and Sulphur content tested.
(b)		Polycyclic aromatic hydrocarbons (PAH) not tested

9.1.1.1 Petrol Samples

- The Czech Republic has exceeded minimum sampling requirements for all fuel grades.
- All samples have been taken from service stations.

9.1.1.2 Diesel Samples

- Diesel fuel samples tested in 2012 with up to 7% biofuel content exceeded the total minimum requirement.
- Smesna motorova nafta represents a very small proportion of diesel fuel sales in the country. Smesna motorova nafta samples were not tested for polycyclic aromatic hydrocarbons.
- All samples have been taken from service stations.

9.2 Fuel Quality Monitoring 2012

9.2.1 Description of System

Responsible organisation(s)	Ministry of Industry and Trade of the Czech Republic
Fuel Quality Monitoring System (FQMS)	EN 14274 Statistical Model C
Country Size	Small
Summer Period	Normal
Location(s) of sampling	Service Stations
Time/frequency of sampling	Samples have been taken monthly throughout the course of the year for diesel and Super BA-95 E5. Petrol fuels Special BA-91 E5 and Super Plus BA-98 E5 represent less than 2% petrol fuels sales each and so have been sampled at a slightly reduced frequency.
Specification of test methods	Monitoring has been conducted in accordance with EN 14274:2003. Specified quality standards are used in the test procedures. Sampling has been performed by the Czech Trade Inspection and the accredited inspection office SGS for laboratory testing all samples of liquid fuels in compliance with European quality standards for petrol and diesel (EN 228 and EN 590), test and sampling standards and Quality Monitoring System.
Collection of sales data	The fuel sale data was provided by Department of Raw Material and Energy Security at the Ministry of Industry and Trade of the Czech Republic.

Other details

All details required for fuel quality monitoring standards in the Czech Republic were provided. There are other fuel quality parameters monitored for example: oxidative stability, which determinates the age of fuel before use (it is very important information for consumers), or parameter ETBE - Ethyl t-butyl ether, which is added to petrol as an additive for better results of the general impact on air quality.

If the controller of Czech Trade Inspection (CTI) finds poor fuel quality, sales are suspended, until the product is replaced with fuel of required quality. Sanctions are imposed according to Act No. 64/1986 Coll on Czech Trade Inspection, which operates in line with Act No. 311/2006 Coll for fuels and petrol stations. Additionally, at some petrol stations small quantities of fuels such as: BA-91 and FAME are sold. These fuels are not purchased in large quantities due to the technical requirements of the engine to accept these fuels(e.g. limited use in agricultural production FAME- green diesel). There are additional parameters tested in addition to the requirements of the European Commission, such as filterability of diesel in the winter (CFPP), or potassium content, which is added to petrol for better engine running (movement of the valves). The quality controls of fuel in the 7 regions are coordinated by Authority General Inspectorate – the Czech Trade Inspection.

9.2.2 Fuel Quality Monitoring System

9.2.2.1 Sampling

The Czech Trade Inspection performs the sampling of fuels in cooperation with an accredited laboratory of SGS Czech Republic Ltd. Division of fuels and lubricants for laboratory testing is in compliance with European standards EN 228 and EN 590. Sampling itself is performed according to national legislation, and standards of the Fuel Quality Monitoring System.

Sampling has been performed at the retail stations exclusively and geographically spread equally across the whole country. The frequency and sampling numbers are specified in the ČSN EN 14274:2003 (winter and in summer sampling is performed with the minimum number 50 samples per season).

In 2012 3121 samples of fuels were taken at the 1294 service stations, which included 1274 samples of petrol and 1413 samples of diesel. The total number of fuel samples includes additional fuels from the Czech market; namely samples of mixed diesel (55 samples), 100% biodiesel – FAME (21 samples), type of petrol E85 has content ≥ 85% bio-component from total volume of biofuel (19 samples) and other, gaseous fuel type CNG – natural gas (38 samples) and LPG - Liquefied Petroleum Gas (301 samples).

In total, there were 756 samples of petrol in winter time and 843 samples of diesel checked, plus one sample of artic diesel and 518 samples of petrol and 570 samples of diesel in summer time.

9.2.2.2 FQMS administration

The Fuel Quality Monitoring System is controlled by the Ministry of Industry and Trade of the Czech Republic (MIT): Department of Gas Industry and Liquid Fuels. This organisation is responsible for this work agenda at the national level in conformity with the FQD (Directive 2009/30/EC of the European Parliament and of the Council).

Annual data collected during the fuel quality monitoring for the previous calendar year is provided by the Czech Trade Inspection (CTI) in the form of an annual report to MIT, Department of Gas and Liquid Fuels. This information is used for reporting to the Commission.

FQMS has been carried out since 2001 in the Czech Republic under the control of the Department of Gas and Liquid Fuels Department of the Ministry of Industry and Trade. Regular monitoring of fuels quality is conducted in accordance with standard ČSN EN 14274:2003 and the regional system “C” is applied. This standard is the Czech version of European Standard EN 14274:2003. It was translated by the Czech Office for Standards, Metrology and Testing.

A new version of the European standard EN 14274:2013 was applied for the 2012 FQMS data submission. In the Czech Republic there are three refineries (one of them without oil processing at this time) and about 30 distribution terminals.

9.2.2.3 National Legislation that transposed the FQD

The fuel quality is monitored by Decree No. 133/2010 Coll. on requirements for fuels, monitoring of the composition and quality of fuels and their records, as an executive decree to the Act No. 311/2006 Coll.

The other elements of the Directive transposed into national legislative structure have been incorporated into the Clean Air Act No. 201/2012 Coll. and Regulation No. 351/2012 Coll. on the biofuels sustainability criteria.

9.2.2.4 Reporting periods

Summer period: 1st May -30th September

Winter period: 1st October – 30th April

9.2.3 Compliance with Fuel Quality Limit Values

Table 9-3: Petrol Fuel Grades

Special BA-91 E5- Details of samples that exceed tolerance limits:					
Parameter	**Limit Value**	**Tolerance Limit* (TL)**	**Max/Min value of samples tested**	**No samples outside TL**	**% samples outside TL**
Summer Vapour Pressure, kPa	60	61.3	63.8	1	5.56%
Member State notes No additional information about non-compliant samples, investigation undertaken or enforcement actions has been provided for 2012.					
Super BA-95 E5- Details of samples that exceed tolerance limits:					
Parameter	**Limit Value**	**Tolerance Limit* (TL)**	**Max/Min value of samples tested**	**No samples outside TL**	**% samples outside TL**
RON	95	94.6	91.8	5	0.41%
MON	85	84.5	82.7	5	0.41%
Summer vapour pressure, kPa	60	61.3	82	3	0.61%
Distillation – 100°C, % v/v	46	43.6	45.7	3	0.25%
Ethanol, % v/v	10	10.5	46.1	4	0.33%
Super Plus BA-98 E5- Details of samples that exceed tolerance limits:					
No samples found to be out of compliance with tolerance limits for a fuel with up to 5% ethanol content from biofuel.					

Table 9-4: Diesel Fuel Grades

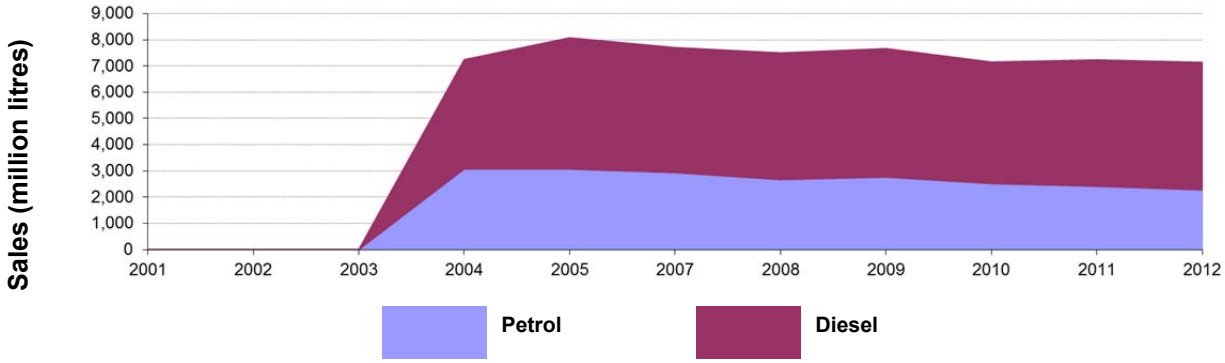
Diesel - Details of samples that exceed tolerance limits:					
Parameter	**Limit Value**	**Tolerance Limit* (TL)**	**Max/Min value of samples tested**	**No samples outside TL**	**% samples outside TL**
Density at 15oC, kg/m3	845	845.3	849	1	0.01%
Distillation –95-%--Point, °C	360	365.9	363	8	0.01%
Sulphur content, mg/kg	10	11.3	402	11	0.78%
FAME content, % V/V	7	7.53	8	1	0.01%
Member State notes No additional information about non-compliant samples, investigation undertaken or enforcement actions have been provided for 2012.					

9.3 Temporal Trends

Figure 9-2 shows the trend in total fuel sales since 2004. Diesel sales in the Czech Republic have increased by 47 million litres (1%) compared to 2011 sales figures, representing an overall increase of 14% since 2004. Petrol fuel sales have decreased by 138 million litres

(5.7%) in the period between 2011 and 2012 with an overall reduction of 35.1% in the period 2004 to 2012.

Figure 9-2: Temporal trends in national sales of petrol and diesel (million litres)



9.4 Statistical Analysis

The following charts in this section are known as box-plots and they display the distribution of fuel characteristics per Member State by illustrating the:

- Sample minimum
- Lower 25% range
- Middle 50% range
- Median
- Upper 25% range
- Maximum

For a full explanation of the information presented in a Box Plot diagram, please see Section 4.

Fuel sampling in the Czech Republic in 2012 recorded some test results out of specification with limits. The analysis charts for petrol (Figure 9-3) and diesel (Diesel sample results for Density and Distillation show large variations in density, exhibited by the widely spread coloured bands at the 25 and 75 quartile. Density samples are within tolerance limits.

Figure 9-4) detail the distribution of sample results for the 5 selected parameters;

Petrol:

- Research Octane Number
- Motor Octane Number
- Summer Vapour Pressure

Diesel:

- Density at 15^{o}C
- Distillation – 95% v/v recovered

Sample results for these parameters have been depicted using box plots based on the reported sample minimum, lower quartile (Q1), median (Q2), upper quartile (Q3), and the maximum sample value.

9.4.1 Petrol Analysis

Sample results in 2012 have been presented in the following figures with limit values for the parameter (maximum or minimum) to demonstrate the skew of sample results. RON and MON samples are fairly tightly distributed very few outliers, whilst DVPE shows more variance. Compliance with tolerance limits is demonstrated for all fuel types, with only RON 91 (a lesser selling fuel type) being close to tolerance levels for Motor Octane Number.

Figure 9-3: Petrol analysis

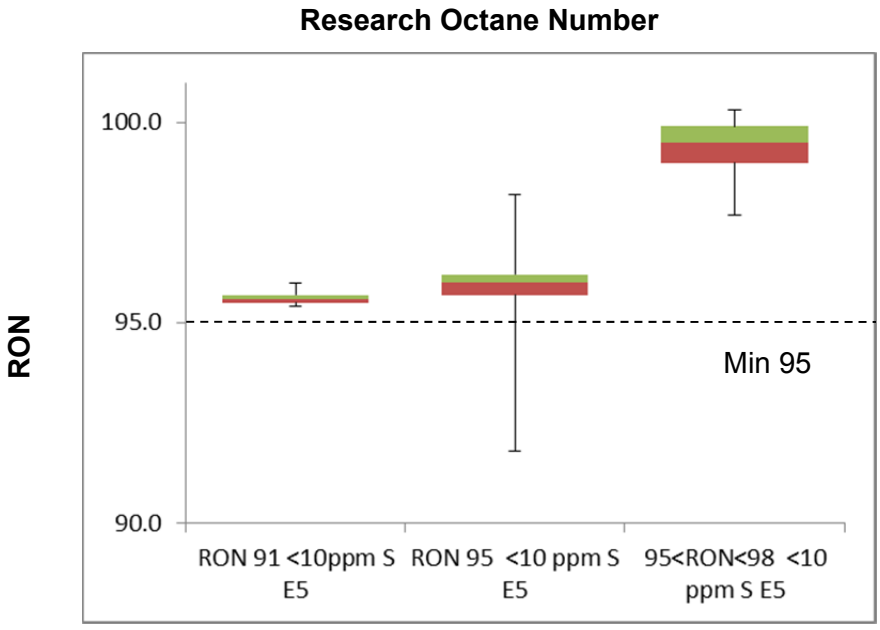
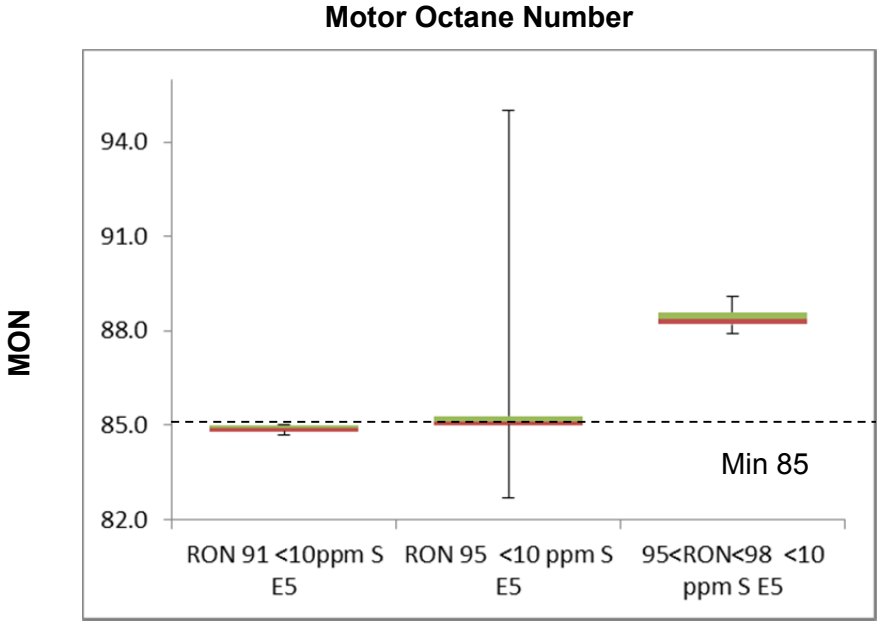
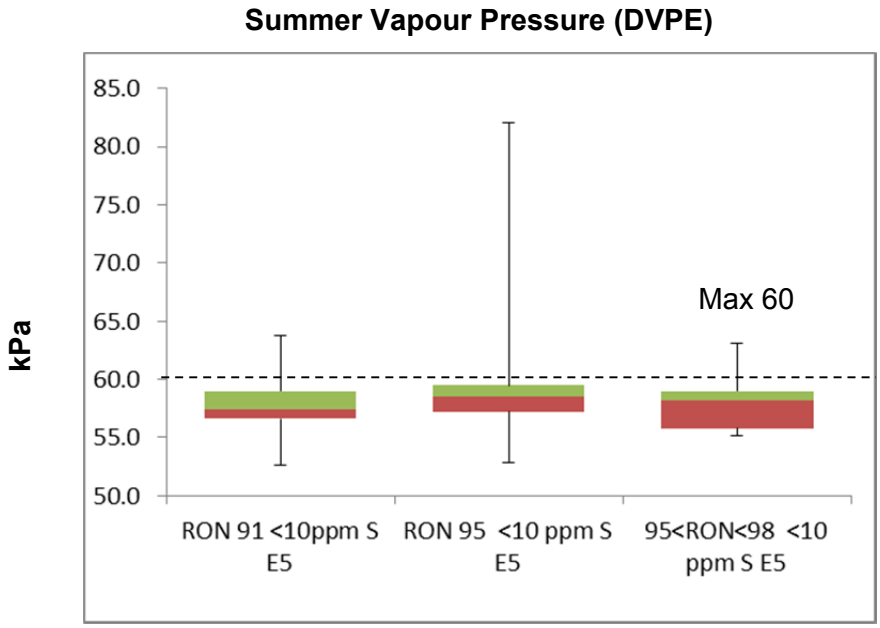


Figure 9-3: (continued)

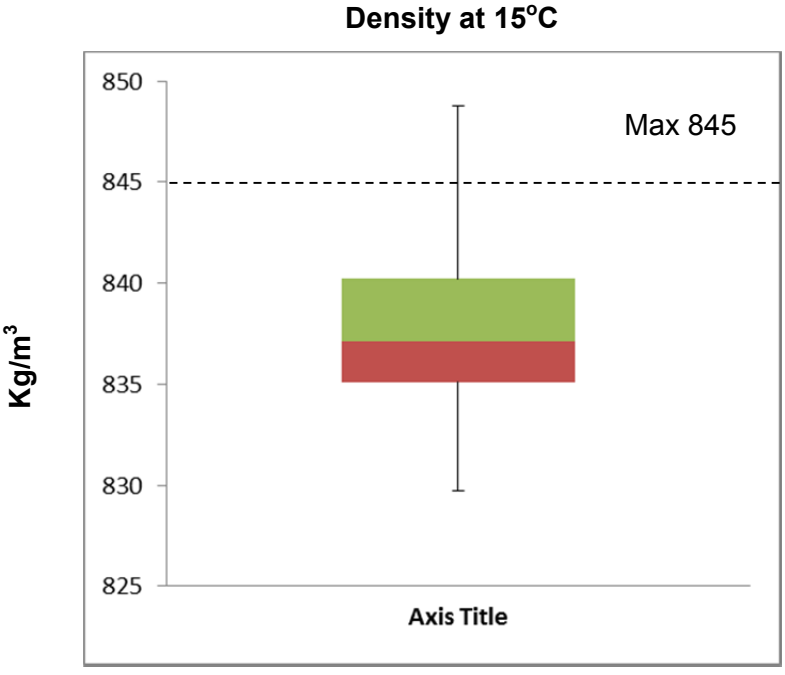




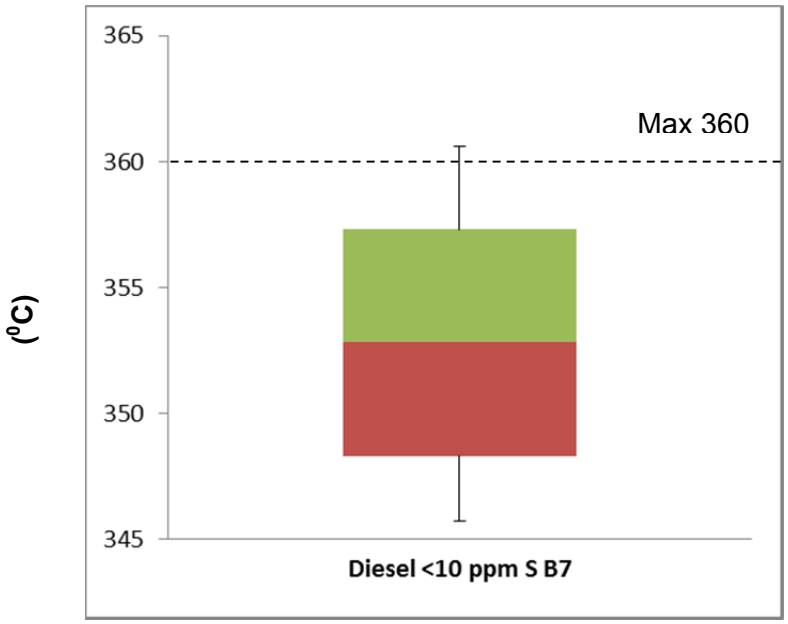
9.4.2 Diesel Analysis

Diesel sample results for Density and Distillation show large variations in density, exhibited by the widely spread coloured bands at the 25 and 75 quartile. Density samples are within tolerance limits.

Figure 9-4: Diesel analysis



Distillation – 95% v/v recovered



9.5 Key Areas for Improvement

The following table summarises the main areas in which improvements could be made to the monitoring system, reporting or compliance with Directive limit values. The table includes key recommendations from the previous year to give an assessment of what action has been taken by the Member State to address any issues that may have been highlighted.

Key Areas for Improvement (3 years)		
	Monitoring	**Reporting**
2012	As in previous years – the Czech Republic have reported using EN 14274 statistical model C when models A or B may be more appropriate. Testing for E85 sampled 5 out of 18 parameters, a full set of testing parameters would be more appropriate.	A number of samples were reported as above tolerance limits, however the maximum sampling result was lower than the TL, details of samples exceeding tolerance limits would benefit the report.
2011	As in previous years – the Czech Republic have reported using EN 14274 statistical model C when models A or B may be more appropriate. The Czech Republic has reported a diesel market fuel share of 4.19% for diesel fuels with more than 7% biofuel content. Although 61	In 2011 sample parameter reporting meets with the requirement of the Directive for all fuel types (with the exception of Diesel B+), however the Czech Republic have noted that further sampling was carried out in 2011 – but not reported.

Key Areas for Improvement (3 years)		
	Monitoring	**Reporting**
	samples were reportedly taken for this fuel type, sample parameter results for only one sample has been partially reported, therefore it has not been possible to assess compliance. The Czech Republic did not report parameter results for FAME Content for diesel fuel grade with more than 7% biofuel content in 2011.	
2010	In 2010 the Czech Republic has used EN14274 statistical Model C. Given the country size, Model A or B may be more appropriate.	No details were provided about the number of RON 91 samples found to be out of specification for Aromatics.

10 Denmark

10.1 Fuel Availability 2012

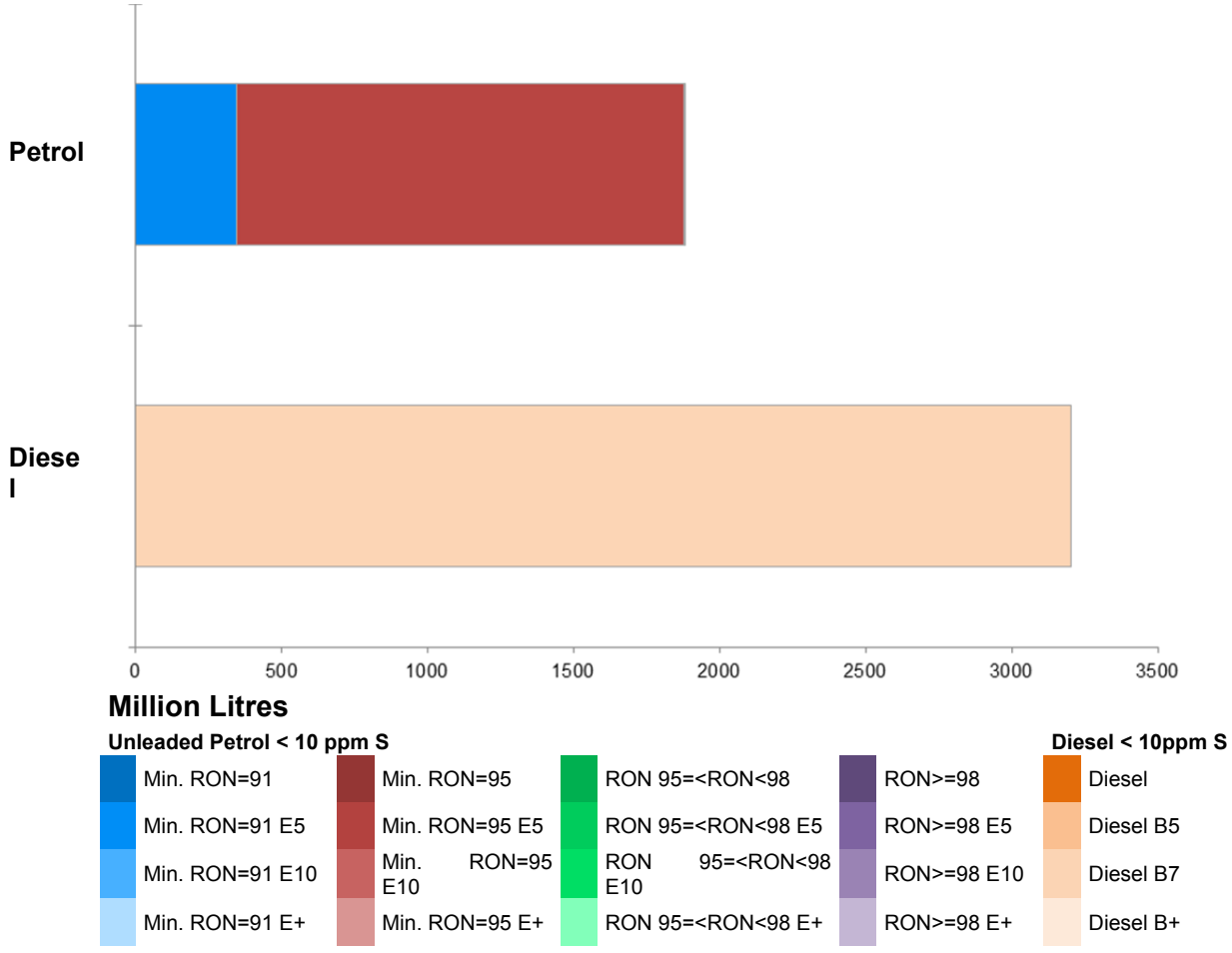
The following table lists the fuels that were reported to be available nationally in 2012.

Table 10-1: National fuel grade

Fuel grade	National fuel grade
Regular unleaded petrol (minimum RON = 91) E5	RON 92
Unleaded petrol (minimum RON = 95) E5	RON 95
Unleaded petrol (minimum 95 =< RON < 98) E5	RON 98
Diesel fuel B7	Diesel B7

10.1.1 Sales, sampling and reporting

Figure 10-1: Fuel Sales proportions by fuel type



During 2012 fuel sales in Denmark were dominated by diesel fuel sales. 3.205 million litres of diesel fuels were sold in 2012 In comparison with petrol fuels which (combined) totalled 1.882 million litres. Petrol fuel sales were comprised of 18.54% RON 91 (with up to 5% biofuel content), 81.38% RON 95 (with up to 5% biofuel content) and 0.1% petrol 95=<RON<98 (with up to 5% biofuel content).

Table 10-2: Fuel sales and sampling

Fuel type (Parent Grade)	Sales (Million litres)	Sales % total of fuel type	Samples (1) S	Samples (1) W	Samples (1) TR (2)	Separate S/W(3)	Parameters measured (4)	Add. Notes
Unleaded petrol min. RON=91 (<10 ppm S) E5	349	18.54%	5	4	(50)	Yes	19 of 19	(a)
Unleaded petrol min. RON=95 (<10 ppm S) E5	1,531	81.38%	14	18	(50)	Yes	19 of 19	(a)
Unleaded petrol 95=<RON<98 (<10 ppm S) E5	2	0.08%	1	1	(1)	Yes	19 of 19	(a)
Total Petrol	**1,882**	**100.00%**	**20**	**23**	**(101)**	**Yes**	**19 of 19**	
Diesel (<10 ppm sulphur) B7	3,205	100.00%	10	11	(50)	Yes	6 of 6	(a)
Total Diesel	**3,205**	**100.00%**	**10**	**11**	**(50)**	**Yes**	**6 of 6**	

(1)	Samples	The actual number of samples taken by the Member State in the summer (s) and winter (w) periods
(2)	TR	Total requirement per summer and winter period according to EN 14274. Brackets () show where a national model is being used, and the requirement is indicative to demonstrate equivalence with EN14274.
(3)	Separate S & W?	Yes indicates separate summer & winter reporting, and No indicates full year sample results reporting only.
(4)	Parameters measured	Currently 19 petrol parameters should be tested and reported by the Member States and 6 diesel parameters. Denmark has reported parameter results against all parameters for all fuel grades.
(a)	Add. Notes	Very low sample quantities have been taken for some parameters, in addition to the very low overall sample quantities. Though Denmark is using a national system, they should still demonstrate equivalence with EN 14274.However, they are not compliant with sampling requirements for petrol fuel grades RON91 E5 or RON95 E5 or diesel B7.

10.1.1.1 Petrol Samples

- Denmark's National Monitoring system has not taken samples of fuels with a market share of <10% equivalent to those required in EN 14274 Statistical models. Denmark have not provided regional sampling data and so the recommended equivalent number of samples for statistical assessment would be 50 samples per summer and winter period (100 samples over the full year) for a Member State with fuel sales of less than 15 million tonnes per annum.
- In addition, some parameters have been sampled at extremely low quantities. For example, fuel grade RON 95 comprises over 80% of fuel sales, and for some parameters a total of 32 samples have been taken over the full year. However for RON, MON, Oxygen content, some of the Oxygenates and lead content, only one sample has been taken.

10.1.1.2 Diesel Samples

- Denmark's National Monitoring system has not taken samples of diesel with a market share of equivalent to those required in EN 14274 Statistical models. Only 21 samples have been taken. For statistical equivalence with EN 14274 there should have been 50 samples taken in the summer period and 50 in the winter period.

10.2 Fuel Quality Monitoring 2012

10.2.1 Description of System

Responsible organisation(s)	Miljøstyrelsen (The Danish Environmental Protection Agency)
Fuel Quality Monitoring System (FQMS)	National model
Country Size	Small
Summer Period	Arctic
Location(s) of sampling	Service Stations
Time/frequency of sampling	Samples of petrol RON 92, RON 95 and diesel have been taken during 3 months of the year (1 in summer, 2 in winter). Samples of RON 98 have been taken in only two months of the year (both in summer).
Specification of test methods	The 2012 sampling and analyses are made by SGS Sweden. All test methods applied for analysis complies with the methods set out in EN 228:2004 and EN 590:2004.
Collection of sales data	Sales data has been provided by the Danish Petroleum Association.

Other details: Denmark provided a Draft Report on Model for an improved Danish fuel quality monitoring system.

Denmark applies a national FQMS with a reduced number of samples due to the following reasons:

- More than 99% of the fuels used for road transport in Denmark are distributed from the two Danish refineries or from terminals owned by members of the Danish Petroleum Association (EOF) which have to meet the Association's Exchange specifications. These specifications are in accordance with DS/EN 228 for petrol and DS/EN 590 for diesel and the current Danish Statutory Order regarding the quality of petrol and diesel fuel.
- More than 99 % of the amount of fuel for road transport in Denmark is delivered from terminals, which are certificated according to ISO 9001 or equivalent quality management system.
- The error rate when filling fuel tanks at fuel dispensing sites is very low. According to EOF there are about 435.000 fillings of fuel tanks at Danish fuel dispensing sites per year. About 20 errors when filling fuel tanks at fuel dispensing sites is reported to EOF per year. 5-10 of the 20 errors has effect on the costumers. This equals an error rate at 0,002 %. The other errors are found and corrected, before the costumers get to fill their vehicles.
- Every year the refinery-laboratories analyses 900-1,000 fuel samples of fuel imported

to Denmark or produced in Denmark for the Danish fuel marked.

- The majority of the refinery-laboratories hold an accreditation in accordance with ISO 17025 for test methods for some environmental parameters in wastewater, but the laboratories don't hold an accreditation in accordance with ISO 17025 for test methods required for the FQMS. Instead the laboratory on the Danish, the Swedish and the Finnish refinery is certificated according to ISO 9001, while the laboratory at the Norwegian refinery follows QP&G, Quality Practice and Guidelines for Exxon Mobil Laboratories.

As in earlier years, some of the specified parameters are only measured on a reduced number of samples. It is parameters which are estimated to have minor influence on the environment.

10.2.2 Fuel Quality Monitoring System

10.2.2.1 Sampling

Danish Energy & Oil Forum (EOF) is responsible for sample collection and analysis, and reports data to the Danish Environmental Protection Agency. Sampling and analysis is performed by laboratory accredited according to EN 14274 and EN 14275. Sampling is done at service stations. Samples are taken 3 times a year; in spring, summer and autumn. Sampling in spring and autumn covers the winter period.

Approximately half of the samples are collected east of the Great Belt and approx. half west of the Great Belt. The population east and west of the Great Belt is almost the same.

The lab sends the proposal for sampling points for acceptance by the Environmental Protection Agency. EPA ensures that the sampling covers all companies in the Danish market and that sampling takes place across the country.

In 2012, sampling and analysis was performed by SGS Sweden. In 2012, a total of 43 gasoline samples and 21 diesel samples were taken.

In 2012, part of winter sampling was performed by mistake on the 4 June rather than as planned, in May. The laboratory has assured EPA that this error does not recur. EPA has chosen to report these tests in June as part of the reporting for the winter season.

10.2.2.2 FQMS administration

The Danish Environmental Protection Agency is responsible for implementing the part of the Directive which deals FQMS.

Sampling is carried out by an accredited laboratory for the Energy and Oil Forum (EOF). The results of sampling and analysis are sent to the EPA. The Environmental Protection Agency oversees the analytical results, to find whether they meet the limit values of the Directive. The Environmental Protection Agency enforces any excess under the applicable rules of the Environmental Protection Act.

In Denmark there are two refineries and 19 depots. More than 99% of the fuel used for road transport in Denmark, is distributed from these two Danish refineries, which are owned by members of the Energy and Oil Forum. Members meet Exchange specifications. More than 99% of the fuel used for road transport in Denmark comes from terminals that are certified according to ISO 9000 or equivalent management systems. More than 99% of the fuel used for road transport in Denmark distributed from terminals where each import / batch is analysed according to EN 228 for petrol and EN 590 for diesel. Some samples of import / batch are not evaluated for all parameters; RON, MON, oxygen and oxygenates (which have a low impact on the environment), and lead (which has not been added Danish Petrol for more than 10 years).

The EPA, on the 28 February 2013, sent a proposal for improved Danish FQMS to the Commission. Compared to the current reporting, the improved Danish model will be complemented by the reporting of analytical results for samples collected from import / batch at the Danish refineries and terminals. The Environmental Protection Agency would be grateful to receive the Commission's views on proposals for an improved Danish FQMS, as described in the memo sent on 28 February 2013.

10.2.2.3 National Legislation that transposed the FQD

Parts of the Directive are incorporated in the Danish Statutory Order No 366 of 15 April 2011 on the quality of petrol, diesel and biofuel blends for use in motor vehicles, etc.

10.2.2.4 Sampling periods

Summer period: 1st June – 31st August

Winter period: 1st September – 31st May

Denmark is covered by the exception in Article 3.4 and 5, on "Artic".

10.2.3 Compliance with Fuel Quality Limit Values

Table 10-3: Petrol Fuel Grades

Regular unleaded petrol (minimum RON = 91) E5 - Details of samples that exceed tolerance limits:
No samples were found to be out of compliance with Directive specifications.
Unleaded petrol (minimum RON = 95) E5 - Details of samples that exceed tolerance limits:
No samples were found to be out of compliance with Directive specifications.
Unleaded petrol (minimum 95 =< RON < 98) E5 - Details of samples that exceed tolerance limits:
No samples were found to be out of compliance with Directive specifications.

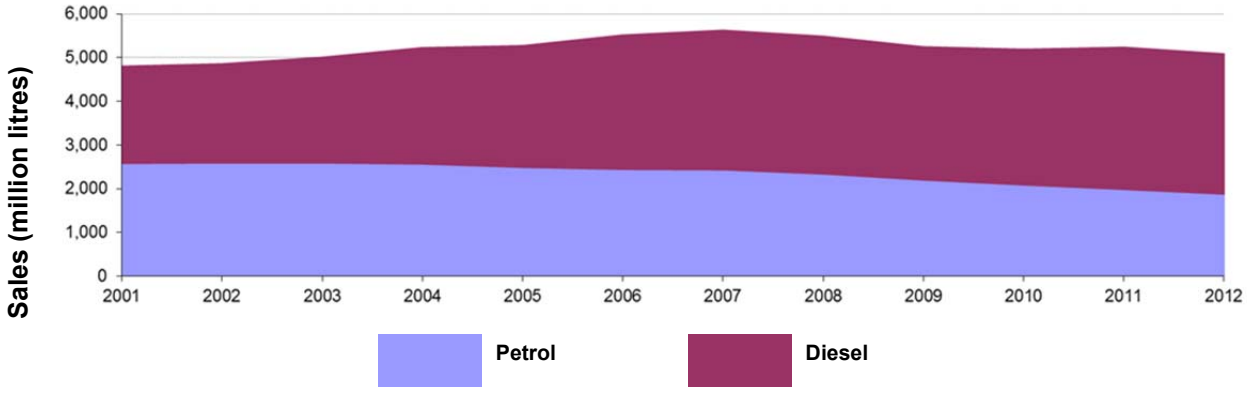
Table 10-4: Diesel Fuel Grades

Diesel - Details of samples that exceed tolerance limits:
No samples were found to be out of compliance with Directive specifications.

10.3 Temporal Trends

Figure 10-2 shows the trend in total fuel sales since 2001. Diesel and petrol sales in Denmark have decreased by 1.4% and 5.3% respectively, compared to 2011 sales figures. Between 2001 and 2012, diesel sales have increased by 31% and petrol fuel sales have decreased by 37.3%.

Figure 10-2: Temporal trends in national sales of petrol and diesel (million litres)



10.4 Statistical Analysis

The following charts in this section are known as box-plots and they display the distribution of fuel characteristics per Member State by illustrating the:

- Sample minimum
- Lower 25% range
- Middle 50% range
- Median
- Upper 25% range
- Maximum

For a full explanation of the information presented in a Box Plot diagram, please see Section 4 of the wider report.

Fuel sampling in Denmark in 2012 recorded no test results out of specification with tolerance limits. The analysis charts for petrol (Figure 10-3) and diesel (Figure 10-4) detail the distribution of sample results for the 5 selected parameters;

Petrol:

- Research Octane Number
- Motor Octane Number
- Summer Vapour Pressure

Diesel:

- Density at 15^{o}C
- Distillation – 95% v/v recovered

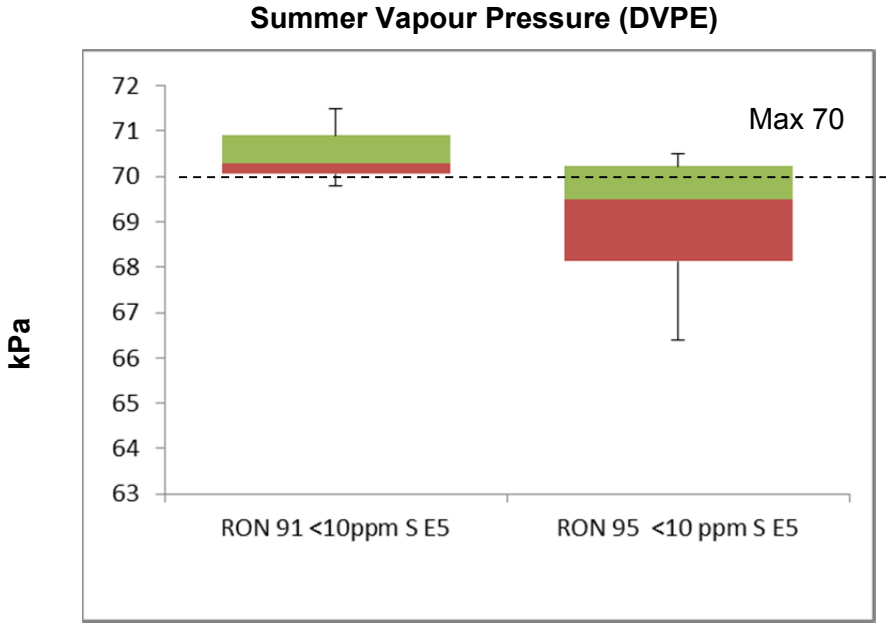
Sample results for these parameters have been depicted using box plots based on the reported sample minimum, lower quartile (Q1), median (Q2), upper quartile (Q3), and the maximum sample value.

10.4.1 Petrol Analysis

Denmark have sampled RON and MON in very low quantities, with only 3 samples of each parameter tested and reported for fuels Regular unleaded petrol (minimum RON = 91) E5 and Unleaded petrol (minimum 95 =< RON < 98) E5 and 1 of each parameter sampled and reported for Unleaded petrol (minimum RON = 95) E5. Therefore it has not been possible to draw any conclusions from statistical analysis of these parameters.

Similarly, only one sample has been tested and reported for the parameter summer vapour pressure for Unleaded petrol (minimum 95 =< RON < 98) E5 and so the results of this fuel grade cannot be included in the analysis chart, below. Of the 18 samples tested and reported for DVPE during summer 2012, none were reported to have exceeded tolerance limits for petrol with up to 5% biofuel content. All samples for RON 92 exceed tolerance limits, whilst RON 95 has some samples which exceed tolerance levels. The number of samples take allows for this analysis to not be conclusive our petrol fuel standards in Denmark.

Figure 10-3: Petrol analysis



10.4.2 Diesel Analysis

As with petrol samples, the low number of diesel samples (21 in total) limit the conclusions that can be drawn from the results.

No samples reportedly exceeded tolerance limits for the parameters; however both sets of values remained fairly tight to specifications.

Figure 10-4: Diesel analysis

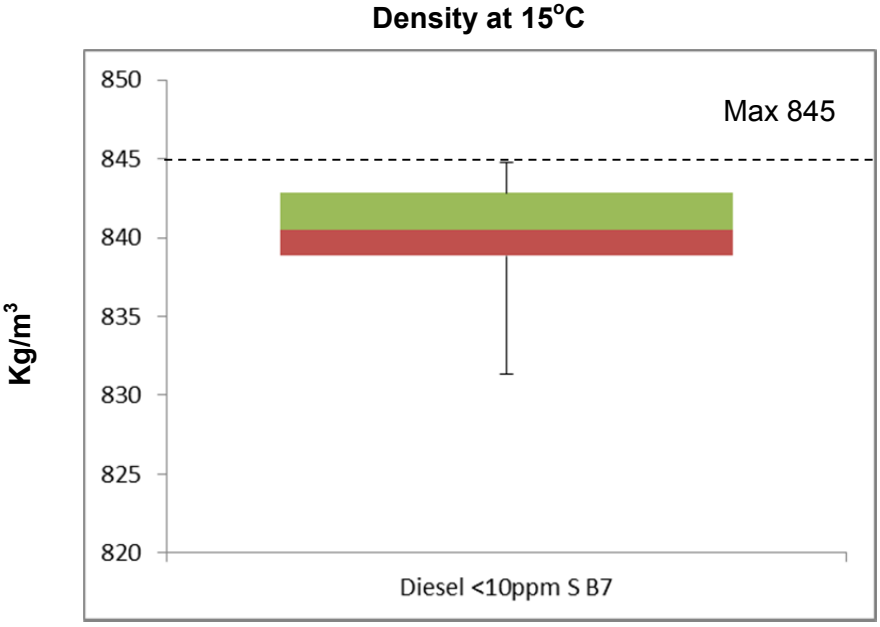
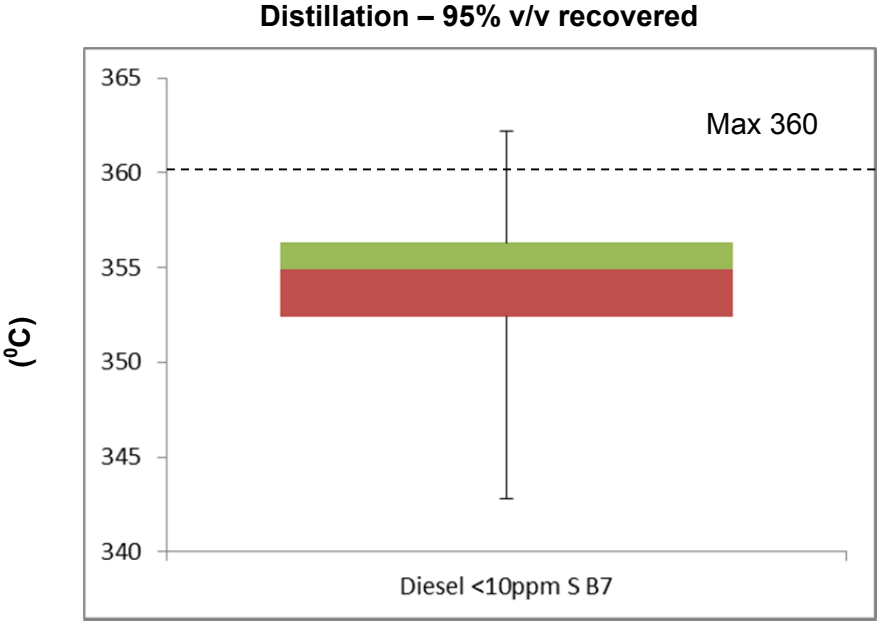


Figure 10-4: Diesel analysis (continued)



10.5 Key Areas for Improvement

The following table summarises the main areas in which improvements could be made to the monitoring system, reporting or compliance with Directive limit values. The table includes key recommendations from the previous year to give an assessment of what action has been taken by the Member State to address any issues that may have been highlighted.

Key Areas for Improvement (3 years)		
	Monitoring	**Reporting**
2012	The monitoring system employed in Denmark's national Model does not demonstrate equivalence with EN 14274. Although Denmark are using the national system, they should still demonstrate equivalence with EN 14274. However, they are not compliant with sampling requirements for petrol fuel grades RON91 E5 or RON95 E5 or for diesel fuel grade B7. Too few samples have been taken for all fuel grades with <10% market share. Some parameters have been sampled at much lower quantities, further eroding statistical confidence in the monitoring carried out in 2012.	The Danish 2012 report was received ahead of the reporting deadline and in the updated 2012 format.
2011	The monitoring system employed in Denmark's national Model does not demonstrate equivalence with EN 14274. Although Denmark are using the national system, they should still	The Danish 2011 report was received ahead of the reporting deadline and in the updated 2011 format.

Key Areas for Improvement (3 years)		
	Monitoring	**Reporting**
	demonstrate equivalence with EN 14274. However, they are not compliant with sampling requirements for petrol fuel grades RON91 E5 or RON95 E5 or for diesel fuel grade B7. Too few samples have been taken for all fuel grades with <10% market share. Some parameters have been sampled at much lower quantities, further eroding statistical confidence in the monitoring carried out in 2011. Denmark has reported two types of diesel fuel sales (diesel with up to 7% biofuel content and diesel with 5% biofuel content). However, it would have been more correct to report it as one type of diesel fuel sale, since diesel with up to 7 % biofuel content was phased in during 2012.	
2010	Denmark has sampled and tested fuels with a market share of >10% in low quantities again in 2010 using a national model that doesn't show equivalent sample numbers with any statistical model outlined in EN 14274. Denmark have sampled parameters deemed to be of minor influence on the environment in reduced quantities (RON, MON, oxygen and oxygenates). This is in accordance with the discussions on the first expert meeting on the implementation of Directive 98/70/EC in Brussels the 3. April 2003, where "Mr. Zierock (DG ENV) suggested that fewer measurements could be taken for less sensitive parameters such as lead and octane number" however with very low sample quantities in the first instance, this limits the conclusions even further about fuel quality that can be drawn from the analysis.	No Comment

11 Estonia

11.1 Fuel Availability 2012

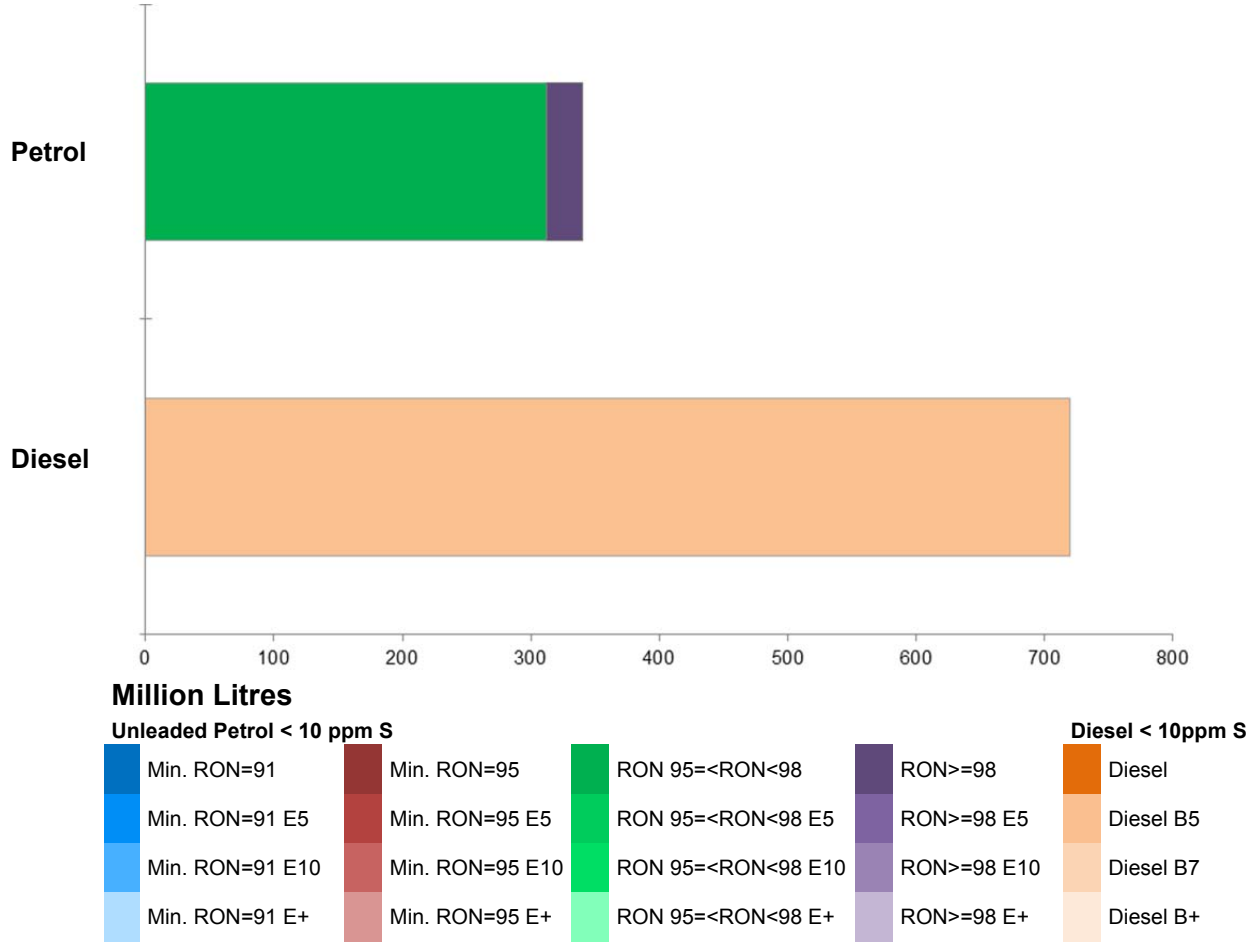
The following table lists the fuels that were reported to be available nationally in 2012.

Table 11-1: National fuel grade

Fuel grade	National fuel grade
Unleaded petrol (minimum 95 =< RON < 98)	RON 95
Unleaded petrol (minimum RON >= 98)	RON 98
Diesel fuel B5	Diesel B5

11.1.1 Sales, sampling and reporting

Figure 11-1: Fuel Sales proportions by fuel type



During 2012, over 700 million litres of diesel was sold in comparison to less than 350 million petrol fuel sales (all petrol grades combined). Petrol fuel sales were mainly comprised of fuel grade RON 95 (91.63%) and all fuels sold in Estonia contained up to 5% biofuel.

Table 11-2: Fuel sales and sampling

Fuel type (Parent Grade)	Sales (Million litres)	Sales % total of fuel type	Samples (1) S	Samples (1) W	Samples (1) TR (2)	Separate S/W(3)	Parameters measured (4)	Add. Notes
Unleaded petrol 95=<RON<98 (<10 ppm S)	312	91.63%	90	90	50	Yes	18 of 19	(a)
Unleaded petrol RON>=98 (<10 ppm S)	28	8.37%	85	85	5	Yes	18 of 19	(a)
Total Petrol	**341**	**100.00%**	**175**	**175**	**55**	**Yes**	**18 of 19**	
Diesel (<10 ppm sulphur) B5	719	100.00%	110	105	50	Yes	6 of 6	
Total Diesel	**719**	**100.00%**	**110**	**105**	**50**	**Yes**	**6 of 6**	

(1)	Samples	The actual number of samples taken by the Member State in the summer (s) and winter (w) periods
(2)	TR	Total requirement per summer and winter period according to EN 14274. Brackets () show where a national model is being used, and the requirement is indicative to demonstrate equivalence with EN14274.
(3)	Separate S & W?	Yes indicates separate summer & winter reporting, and No indicates full year sample results reporting only.
(4)	Parameters measured	Currently 19 petrol parameters should be tested and reported by the Member States and 6 diesel parameters. Estonia has reported all parameter results (apart from Manganese) for all fuel grades.
(a)		Manganese is not reported

11.1.1.1 Petrol Samples

- Estonia has exceeded minimum sampling requirements for all petrol fuel grades and has sampled all required parameters in 2012.

11.1.1.2 Diesel Samples

- As with petrol, sampling quantities of diesel exceeded the minimum requirement of 50 samples per fuel grade per summer and winter period for a small country monitoring using EN 14274 statistical models C.
- All required diesel parameters have been tested and reported in 2012.

11.2 Fuel Quality Monitoring 2012

11.2.1 Description of System

Responsible organisation(s)	Estonian Ministry of Environment
Fuel Quality Monitoring System (FQMS)	EN 14274 Statistical Model C
Country Size	Small
Summer Period	Normal
Location(s) of sampling	Service stations

Time/frequency of sampling	2012 fuel samples have been taken in 7 months of the year for RON 95 and RON 98 fuels and over 8 months for diesel, covering both winter and summer periods.
Specification of test methods	The monitoring followed the European Standard EN 14274. The sample taking followed the European standard EN 14275. Analyses were done in the laboratory of EERC and the applied methods had accreditation.
Collection of sales data	Sales data was obtained from the Estonian Tax and Customs Board.
Other details	

11.2.2 Fuel Quality Monitoring System

11.2.2.1 Sampling

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

11.2.2.2 FQMS administration

Estonian Ministry of Environment is responsible for managing and implementing the FQM Directive. Fuel sampling and analysis is contracted privately with Estonian Environmental Research Centre and the annual report deadline is 30 of May. When non-compliant samples occur, the responsible public bodies that take actions are the Estonian Environmental Inspectorate and the Estonian Tax and Customs Board. These two bodies are informed immediately by e-mail and by post. If necessary, new samples are taken by Tax and Customs Board. The system has been designed in 2004-2005 using EN 14274 model C.

11.2.2.3 National Legislation that transposed the FQD

Elements of the Directive requirements are taken into account in national regulation by Ministry of Economic Affairs and Communications through standards EN 590 and EN 228.

11.2.2.4 Reporting periods

Winter period: 01.12 - 28/29.02. Summer period: 01.05 - 30.09. Transition periods are 01.10 - 30.11 and 01.03 - 30.04. No samples are taken during the transitions periods.

11.2.3 Compliance with Fuel Quality Limit Values

Table 11-3: Petrol Fuel Grades

RON 95 Petrol - Details of samples that exceed tolerance limits:					
Parameter	**Limit Value**	**Tolerance Limit* (TL)**	**Max/Min value of samples tested**	**No samples outside TL**	**% samples outside TL**
RON	95	94.6	93.7	3	1.67%
MON	85	84.5	85.184.2	1	0.55%
Summer vapour pressure, kPa	70	71.9	77.1	1	1.11%
Member State notes In the case of all samples found to be non-compliant with specified limits, Authorities were informed and an investigation was initiated.					

RON 98 Petrol - Details of samples that exceed tolerance limits:					
Parameter	**Limit Value**	**Tolerance Limit* (TL)**	**Max/Min value of samples tested**	**No samples outside TL**	**% samples outside TL**
RON	98	97.6	97.1	1	0.59%
Aromatics, % v/v	35	36	36.5	2	1.18%
Member State notes In all cases where samples were found to be non-compliant with specified limits, Authorities were informed and an investigation was initiated.					

Table 11-4: Diesel Fuel Grades

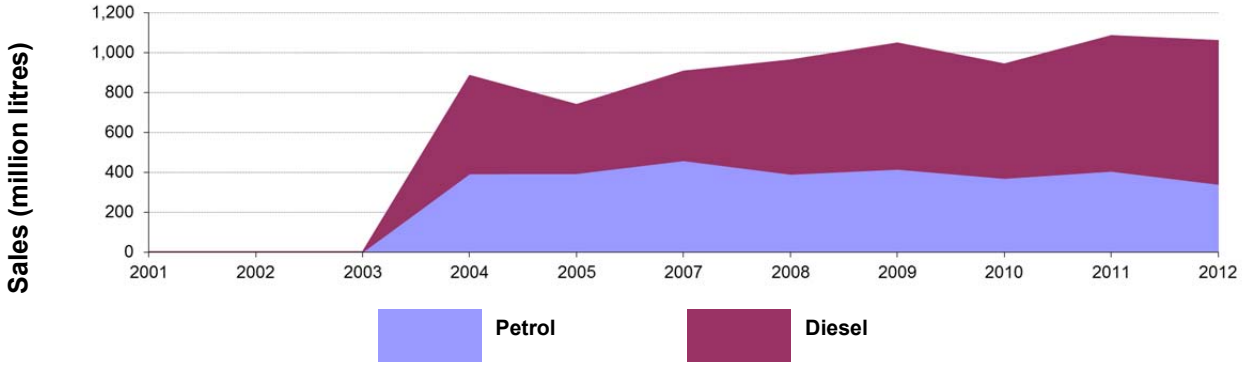
Diesel B5 - Details of samples that exceed tolerance limits:					
Parameter	**Limit Value**	**Tolerance Limit* (TL)**	**Max/Min value of samples tested**	**No samples outside TL**	**% samples outside TL**
Distillation- 95% point	360	365.9	369	1	0.46%
Sulphur Content	10	11.8	24	1	0.46%
Member State notes In all cases where samples were found to be non-compliant with specified limits, Authorities were informed and an investigation was initiated.					

11.3 Temporal Trends

Figure 11-2 shows the trend in total fuel sales since Estonian EU reporting began in 2004. In the period 2011 to 2012, petrol fuel sales in Estonia have decreased by 16.2% from 406 million litres to 341 million litres of petrol sold. In the period since 2004, petrol fuel sales in Estonia have fluctuated, peaking at 464 million litres in 2006, before declining. Overall, the decrease in petrol fuel sales since 2004 has been just over 15%.

Diesel sales between 2011 and 2012 have increased by 6% rising from 678 million litres to 719 million litres. Diesel fuel sales have also fluctuated in the years since reporting began, as demonstrated in the chart, below. In the period since 2004, diesel fuel sales decreased in the period 2004-2005 and again in the period 2008-2009, however have risen between all other reporting periods. Overall, diesel fuel sales have increased by 31.7%.

Figure 11-2: Temporal trends in national sales of petrol and diesel (million litres)



11.4 Statistical Analysis

The following charts in this section are known as box-plots and they display the distribution of fuel characteristics per Member State by illustrating the:

- Sample minimum
- Lower 25% range
- Middle 50% range
- Median
- Upper 25% range
- Maximum

For a full explanation of the information presented in a Box Plot diagram, please see Section 4 of the wider report.

The analysis charts for petrol (Figure 11-3) and diesel (Figure 11-4) detail the distribution of sample results for the 5 selected parameters;

Petrol:

- Research Octane Number
- Motor Octane Number
- Summer Vapour Pressure

Diesel:

- Density at 15^{o}C
- Distillation – 95% v/v recovered

Sample results for these parameters have been depicted using box plots based on the reported sample minimum, lower quartile (Q1), median (Q2), upper quartile (Q3), and the maximum sample value.

11.4.1 Petrol Analysis

Sample results in 2012 have been presented in the following figures with limit values for the parameter (maximum or minimum) to demonstrate the skew of sample results.

RON and MON sample results show that the fuels available in Estonia have reasonably small variation in Octane level and that the majority of sample results remained very tight to minimum specifications for the parameters. There were samples of both RON and MON that were found to be non-compliant with minimum levels, however these were outliers.

Summer Vapour pressure results demonstrate wider spread, with the bulk of results remaining within specification but more dispersed than can be observed for RON and MON.

Figure 11-3: Petrol analysis

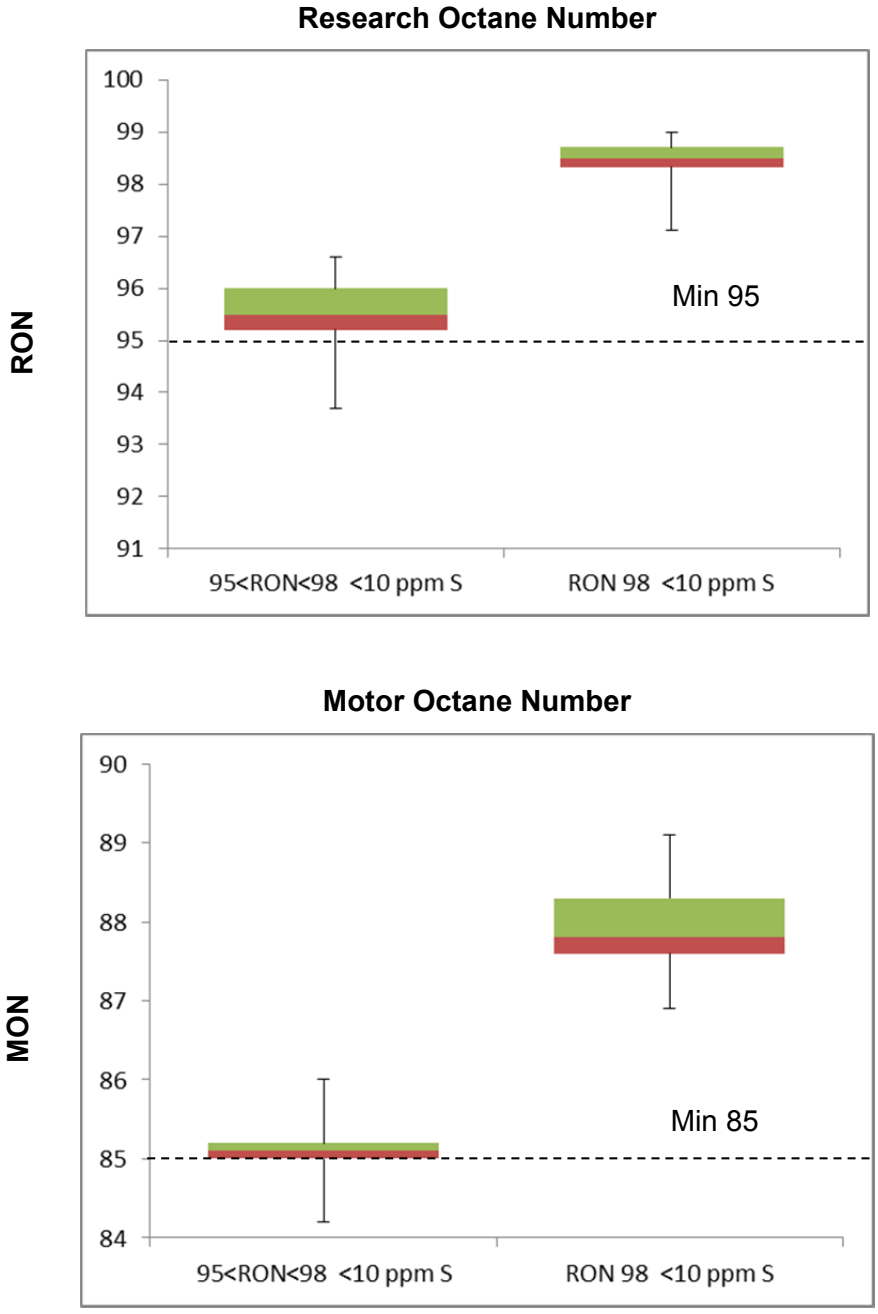
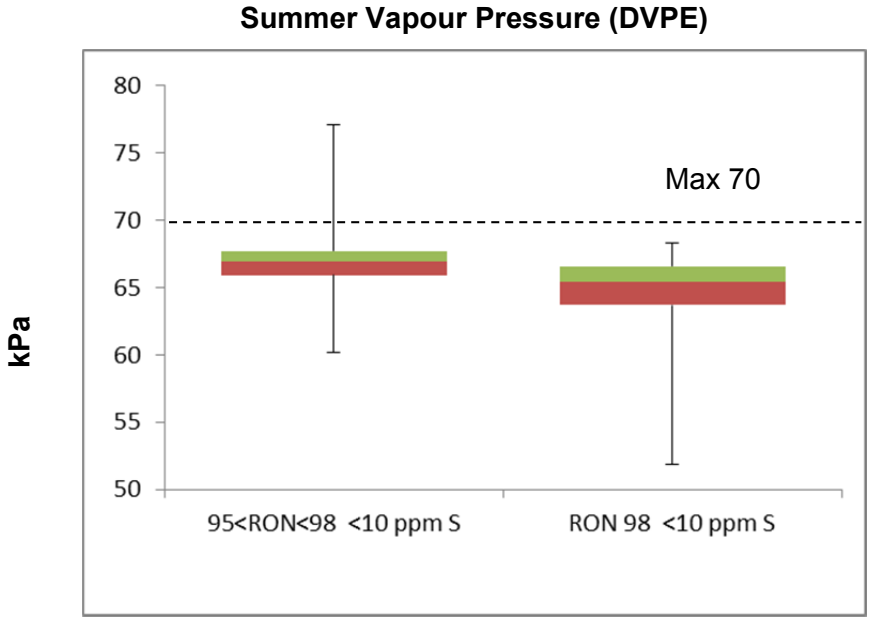


Figure 11-3: Petrol analysis (continued)



11.4.2 Diesel Analysis

Diesel sample results for Density show a slightly wider variation for the bulk of samples tested for density and for distillation, exhibited by the widely spread coloured bands at the 25 and 75 quartile – in comparison to the tight bands shown in the petrol analysis box plots.

In addition, both Density and Distillation demonstrated only small levels of outliers towards specification (maximum values), with no values over the limit values for either parameter.

Figure 11-4: Diesel analysis

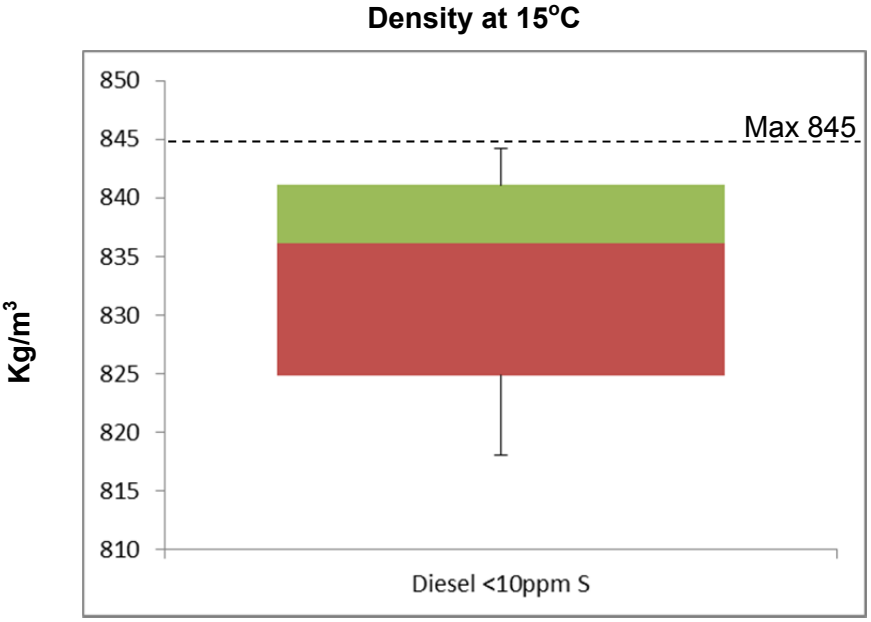
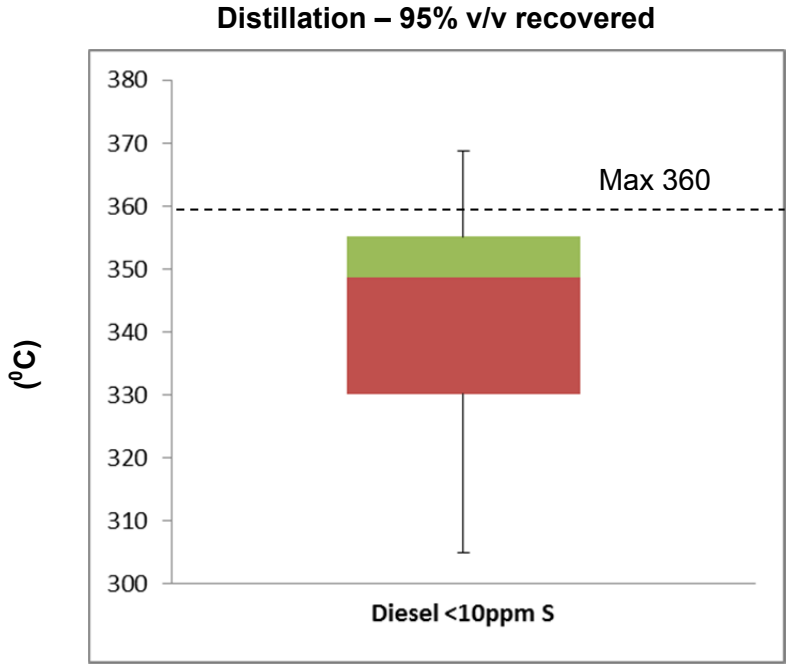


Figure 11-4: Diesel analysis (continued)



11.5 Key Areas for Improvement

The following table summarises the main areas in which improvements could be made to the monitoring system, reporting or compliance with Directive limit values. The table includes key recommendations from the previous year to give an assessment of what action has been taken by the Member State to address any issues that may have been highlighted.

Key Areas for Improvement (3 years)		
	Monitoring	**Reporting**
2012	• No regional split provided however detail of sampling of marine fuels and certain liquid fuels were provided in addition to details for the FQMS.	• No comment, all information provided
2011	• No regional split of sales has been provided for Estonia again in 2011 and it has not been demonstrated that division into macro-regions or non-macro regions is not possible.	• The Estonian report was received on time and in the 2011 format. All information was provided.
2010	• No regional split of sales.	• No comment

12 Finland

12.1 Fuel Availability 2012

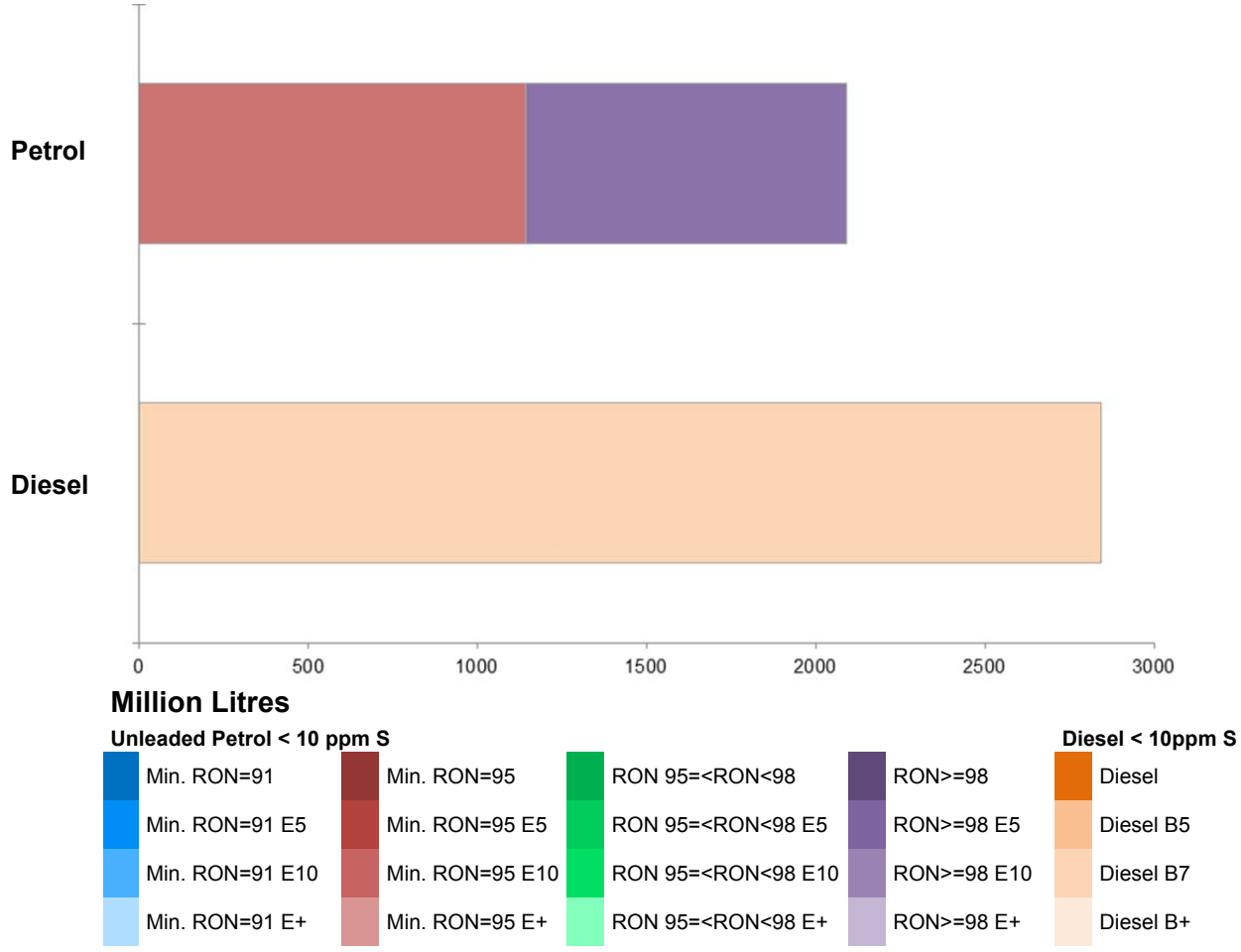
The following table lists the fuels that were reported to be available nationally in 2012.

Table 12-1: National fuel grade

Fuel grade	National fuel grade
Unleaded petrol (minimum RON = 95) E10	Moottoribensiini 95 E10
Unleaded petrol (minimum RON >= 98) E5	Moottoribensiini 98 E5
Diesel fuel B7	Dieselöljy

12.1.1 Sales, sampling and reporting

Figure 12-1: Fuel Sales proportions by fuel type



During 2012 diesel fuel sales in Finland have exceeded petrol fuel sales with 2,843 million litres of diesel sales compared to combined petrol fuel sales of just over 2,092 million litres. The maximum FAME content of all diesel fuel is 7%. Petrol fuel sales of Min. RON=95 with ethanol content of up to 10% and RON 98 with ethanol content of up to 5% were reasonably equally weighted at 55% and 45% petrol fuel share (respectively).

Table 12-2: Fuel sales and sampling

Fuel type (Parent Grade)	Sales (Million litres)	Sales % total of fuel type	Samples (1) S	Samples (1) W	Samples (1) TR (2)	Separate S/W(3)	Parameters measured (4)	Add. Notes
Unleaded petrol min. RON=95 (<10 ppm S) E10	1,144	54.69%	62	57	50	Yes	18 of 19	(a)
Unleaded petrol RON>=98 (<10 ppm S) E5	948	45.31%	62	54	50	Yes	18 of 19	(a)
Total Petrol	**2,092**	**100.00%**	**124**	**111**	**100**	**Yes**	**18 of 19**	
Diesel (<10 ppm sulphur) B7	2,843	100.00%	61	61	50	Yes	5 of 6	(b)
Total Diesel	**2,843**	**100.00%**	**61**	**61**	**50**	**Yes**	**5 of 6**	

(1)	Samples	The actual number of samples taken by the Member State in the summer (s) and winter (w) periods
(2)	TR	Total requirement per summer and winter period according to EN 14274. Brackets () show where a national model is being used, and the requirement is indicative to demonstrate equivalence with EN14274.
(3)	Separate S & W?	Yes indicates separate summer & winter reporting, and No indicates full year sample results reporting only.
(4)	Parameters measured	Currently 19 petrol parameters should be tested and reported by the Member States and 6 diesel parameters.
(a)	Add. Notes	Manganese content of petrol was not examined. However, according to the oil companies MMT is not used in fuels marketed in Finland.
(b)	Add. Notes	Finland did not report parameter results for FAME content in diesel fuel. FAME content was not examined, because bio-origin component of diesel oil produced in Finland is HVO (NExBTL). However, the Customs Laboratory is prepared to start FAME analysis in 2014.

12.1.1.1 Petrol Samples

- Finland have complied with or exceeded minimum sampling requirements (50 per period per fuel grade comprising over 10% of market share) for all petrol fuel grades.

12.1.1.2 Diesel Samples

- Diesel fuel samples tested in 2012 complied with the total minimum requirement of 50 samples per grade per period for a 'small' (total fuel sales of less than 15 million tonnes) Member State using EN 14274:2003 statistical model A.
- Finland has not reported FAME content in 2012, however have stated plans to do so from 2014 onwards.

12.2 Fuel Quality Monitoring 2012

12.2.1 Description of System

Responsible organisation(s)	Finnish Customs Laboratory
Fuel Quality Monitoring System (FQMS)	EN 14274 Statistical model A

Country Size	Small
Summer Period	Arctic
Location(s) of sampling	Service stations
Time/frequency of sampling	Samples were taken throughout Finland according to the sampling plan following the guidelines of the standard EN 14274:2003 model A. The division of the consumption per macro region is based on total annual consumption of petrol (including 95 and 98 octane grades). However, given that the sales volume for 99 octane petrol was small it has been excluded from sampling and testing by Finland.
Specification of test methods	Except for the lead method, all methods of analysis used (including those subcontracted) were reference methods according to the standards EN 228:2008 and EN 590:2009. The lead method used by the laboratory (determination of lead content in petrol by energy dispersive X-ray fluorescence spectroscopy) is a so called screening method. The sensitivity of the method used, however, is much better than the limit indicated in the quality requirements.
Collection of sales data	Sales data was provided by the Finnish Petroleum Federation for 2012.
Other details	

12.2.2 Fuel Quality Monitoring System

12.2.2.1 Sampling

According the agreement (38/481/2001) between Finnish Customs and Ministry of Environment, Customs is responsible for sampling, analysis and reporting the results of analysis. Sampling was done in the whole country according to the sampling plan following the guidelines of the standard EN 14274:2003 model A. The country was divided to 3 macro-regions with about same sales volume and variability factor (see Regional Sampling sheets). There were 2 refineries and 19 terminals in operation. The number of retail sites, in macro regions was; 648, 751 and 493, making a total of 1892. The sampling places were selected randomly ensuring all distribution chain companies were included. All samples were taken in retail sites. The division of the consumption per macro region is based on total annual consumption of 95 (95 E10) and 98 (98 E5) octane grades. Diesel fuel consumption figures per macro region are for the whole year as well. The sampling was split to winter and summer periods in order to take minimum sample amount in both periods.

The grades investigated were unleaded RON 95 (95 E10) and RON 98 (98 E5) octane sulphur free (max. 10 mg/kg) petrol and sulphur free (max. 10 mg/kg) diesel fuel. The fuels were furthermore divided into summer and winter grade. Since the sales for RON 99 octane petrol was small (less than 2%), it was excluded from the actual sampling. Also, there was no quality under RON 95 octane on the market. The sampling aims to comply, when applicable, with the requirements of standard EN 14275:2003. The sampling was done by trained personnel. One litre metal containers and five litre plastic containers approved for this purpose were used as sampling containers. Before the vapour pressure analysis, the sampling containers were cooled according to the requirements of the method. The sampling was done by trained personnel. One litre metal containers and five litre plastic containers approved for this purpose were used as sampling containers.

The analyses were conducted at the Customs Laboratory, which is a testing laboratory accredited by FINAS Accreditation Service. For octane and cetane numbers, subcontractors whose competence was confirmed, were used. Except for the lead method, all methods of analysis used (including those subcontracted) were according to the standards EN 228:2008 and EN 590:2009. The lead method used by the laboratory (determination of lead content in petrol by energy dispersive X-ray fluorescence spectroscopy) is a so called screening method. The sensitivity of the method used, however, is much better than the limit indicated in the quality requirements. The average lead content measured in the samples was clearly below the limit set in the quality requirements. If needed, the laboratory has the ability to confirm the lead content of the sample with the EN 237 method according to the Directive (determination of low lead concentrations by atomic absorption spectrometry) in cases where the result is near or exceeds the quality limit. Sulphur (method EN-ISO 20846), density (method EN-ISO 12185) and vapour pressure (method EN 13016-1) methods have been accredited by FINAS Accreditation service. Other methods used by the laboratory have been tested and validated according to quality procedure of Customs Laboratory. These test methods are EN-ISO 3405 (distillation of petrol and diesel), ASTM D1319 (olefins and aromatics contents for petrol), EN 13132 (oxygen and oxygenates contents of petrol) and EN 12916 (polycyclic aromatic hydrocarbons of diesel). Manganese content of petrol was not examined. According to the oil companies MMT is not used in fuels marketed in Finland. FAME content of diesel fuel was not examined, because bio-origin component of diesel fuel produced in Finland is HVO (NExBTL). However, the Customs Laboratory is prepared to start FAME analysis in 2014. The authenticity and accuracy of the methods used by the laboratory have been verified by the national Round Robin and international PT comparative studies. The determination of RON- (EN-ISO 5164), MON -(EN-ISO 5163) and cetane number (EN-ISO 5165) have been done by external contractor, which also provides the accreditation procedure for these methods.

Comparative examinations

In 2012, the Customs Laboratory took part in the Round Robin Finland testing, which performs national inter-laboratory fuel examinations and tests organized by IIS (Institute of Inter-laboratory Studies). The results of the parameters measured in the tests (sulphur content, density, distillation, vapour pressure, lead, benzene content, total oxygen content, aromatics and olefins contents, ethers and ethanol contents) were acceptable. In 2001 - 2011 the laboratory also took part in these tests with acceptable results.

12.2.2.2 FQMS administration

The Ministry of the Environment is responsible for transposition of the Directive into the national legislation, approving plans and giving general guidance. Finnish Customs is responsible for the practical implementation and fuel quality monitoring as explained in previous sections. In the case of non-compliant samples the analyses will be repeated as soon as possible. If non-compliance is confirmed, the Customs contacts the fuel supplier/oil company to get a detailed account. If clear reason for non-compliance is not found, if there's no signs of intentional offending action, and the case is not a serious one, a written procedure is often considered appropriate and sufficient. When non-compliant samples are repeatedly found, remark or formal complaints may also be given. According to Section 84 (Rectification of a violation or negligence) of the Environmental Protection Act (86/2000) a supervisory authority may prohibit a party from continuing or repeating a procedure which violates existing regulations or order a party to fulfil its duty in some other way. Ministry of the Environment is informed about actions taken. If there is a risk that non-compliant fuel can cause damage to the vehicle (lead, sulphur) and the fuel is still on the market, it is possible to order the fuel supplier to remove the product from the market. According to Section 87 (Decision to prohibit or require action on substances, preparations, products, equipment and machines) the Ministry of the Environment may prohibit the manufacturer, importer or other market supplier from continuing operations that are contradicting existing regulations; prohibit the trading, sale or other supply of products that are in violation of the existing regulations; require the offender to bring the product into compliance with the regulations or otherwise

meet its obligations. If a product has been placed on the market, the Ministry may require the party acting contrary to the existing regulations to remove the product from the market.

12.2.2.3 National Legislation that transposed the FQD

The supervision of the quality of fuel is based on the Environmental Protection Act (86/2000), the Government Decree on the quality requirements for petrol and diesel fuel (1206/2010) and an agreement between the Ministry of the Environment and Finnish Customs (38/481/2001). According to the agreement; Finnish Customs prepares a yearly sampling plan, which is to be approved by the Ministry of the Environment. Finnish Customs is in charge of the practical realization of delivery. The Customs' national district organization takes care of taking liquid fuel samples according to the sampling plan, and the samples are analysed at the Customs Laboratory. The supervision aims to comply, when applicable, with the requirements of standard EN 14274:2003 model A.

12.2.2.4 Reporting periods

Summer – 1st June – 31st August

Winter – 1st September – 31st May

An 'Artic' derogation has been granted in 2011. The summer period is 1.6 - 31.8 during which the maximum vapour pressure is 70 kPa. Details can be found in the Commission decisions K(2011) 714 final and K(2011) 3772 final and the Finnish notification letter on Fuel Quality Vapour Pressure Derogation. Original notification dated 17 February 2010, supplementary information 26 June 2010 and 6 September 2010. The sampling was split to winter and summer periods in order to take minimum sample amount in both periods. The results of samples taken during the transition period have been reported within the annual fuel quality report.

12.2.3 Compliance with Fuel Quality Limit Values

Table 12-3: Petrol Fuel Grades

Unleaded Petrol (Minimum RON = 95) – Moottoribensiini 95 E10 - Details of samples that exceed tolerance limits:					
Parameter	**Limit Value**	**Tolerance Limit* (TL)**	**Max/Min value of samples tested**	**No samples outside TL**	**% samples outside TL**
Distillation – evaporated at 100°C %v/v	46.0	43.6	43	1	0.84%
Oxygen content	3.7	3.9	4.6	1	0.84%
Ethanol	10	10.5	12.4	1	0.84%
Member State notes No special enforcement actions were deemed necessary.					
Unleaded Petrol (Minimum RON = 98) – Moottoribensiini 98 E5 - Details of samples that exceed tolerance limits:					
Parameter	**Limit Value**	**Tolerance Limit* (TL)**	**Max/Min value of samples tested**	**No samples outside TL**	**% samples outside TL**
Distillation – evaporated at 100oC %v/v	46.0	43.6	40.3	11	9.48%
Aromatics	35.0	36.0	37.3	1	1.72%
Oxygen content	2.7	2.9	3.2	2	1.72%
Member State notes Aromatics were analysed using ASTM D1319 for which 37.2 % is used as a tolerance figure. No special enforcement actions were deemed necessary.					

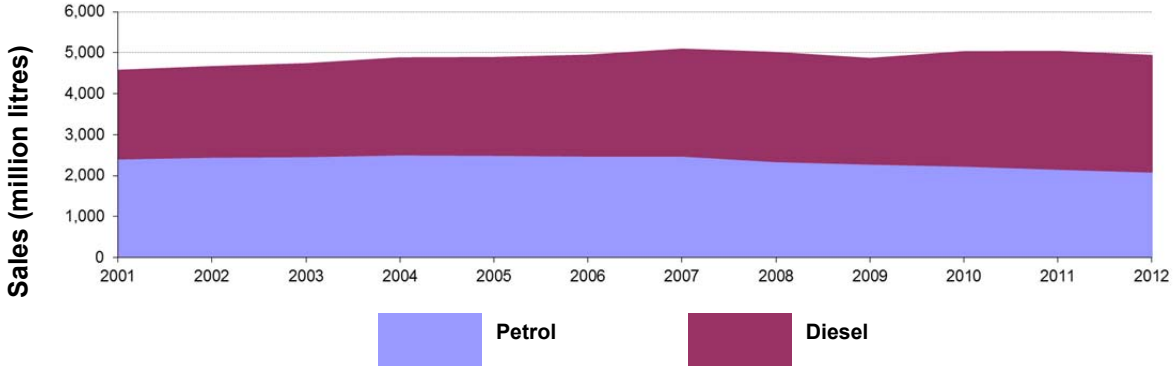
Table 12-4: Diesel Fuel Grades

Diesel Fuel B7 Dieselöljy - Details of samples that exceed tolerance limits:					
Parameter	**Limit Value**	**Tolerance Limit* (TL)**	**Max/Min value of samples tested**	**No samples outside TL**	**% samples outside TL**
Cetane Number	51	48.5	46.1	1	1.75%
Member State notes No special enforcement actions were deemed necessary.					

12.3 Temporal Trends

Figure 12-2 shows the trend in total fuel sales since 2001. Diesel sales in Finland in 2012 have risen since 2001; however 2012 sees a 1% drop in sales figures when compared to 2011. Petrol fuel sales have also decreased by 3.2%, similar to 3.4% reduction between 2010 and 2011. Overall, diesel fuel sales have increased by 24.1% since 2001 and petrol fuel sales have seen a reduction of 15.3% in the period 2001-2012.

Figure 12-2: Temporal trends in national sales of petrol and diesel (million litres)



12.4 Statistical Analysis

The following charts in this section are known as box-plots and they display the distribution of fuel characteristics per Member State by illustrating the:

- Sample minimum
- Lower 25% range
- Middle 50% range
- Median
- Upper 25% range
- Maximum

For a full explanation of the information presented in a Box Plot diagram, please see Section 4 of the wider report.

Fuel sampling in Finland in 2011 recorded only one test result out of specification with limit values. The analysis charts for petrol (Figure 12-3) and diesel (Figure 12-4) detail the distribution of sample results for the 5 selected parameters;

Petrol:

- Research Octane Number
- Motor Octane Number

- Summer Vapour Pressure

Diesel:

- Density at 15°C
- Distillation – 95% v/v recovered

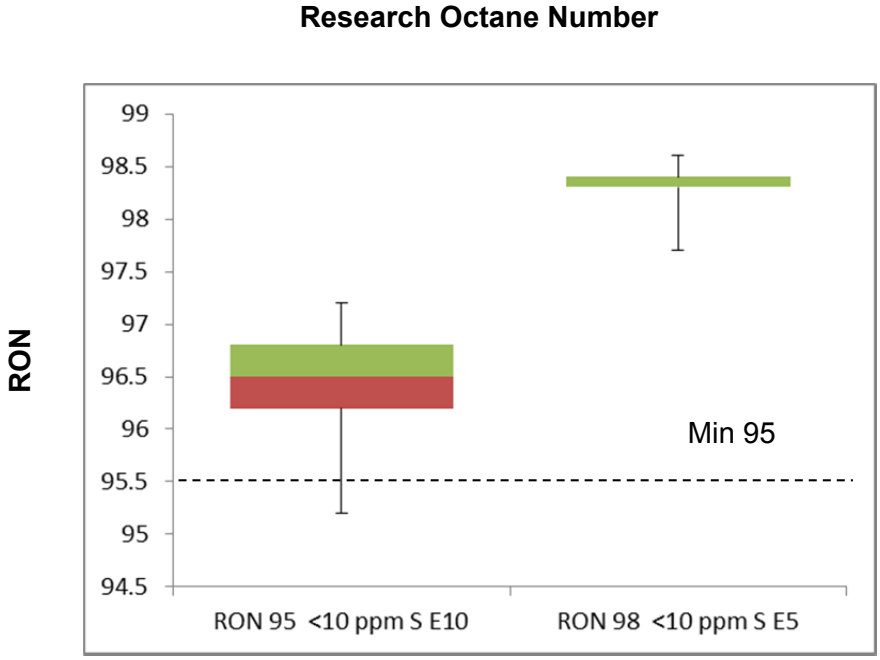
Sample results for these parameters have been depicted using box plots based on the reported sample minimum, lower quartile (Q1), median (Q2), upper quartile (Q3), and the maximum sample value.

12.4.1 Petrol Analysis

All RON, MON and DVPE samples remained within tolerance limits with the exception of RON 95 having a sole outlier lower than the MON tolerance level. Typically, RON and MON remain tight to specification, with a similar level of variance between both petrol fuel grades.

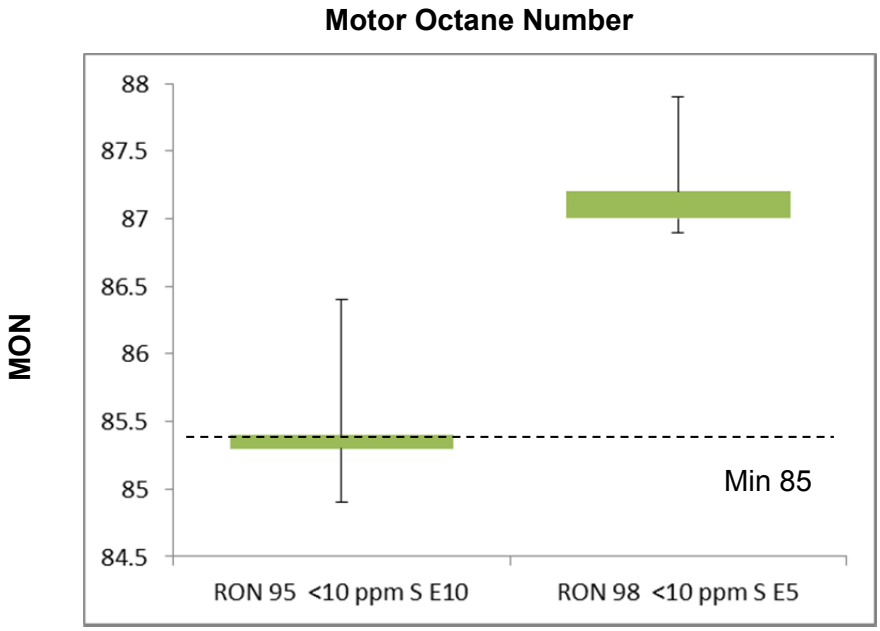
Finland reported vapour pressure according to arctic climatic conditions. This means that the limit value for summer vapour pressure is 70 kPa. Vapour pressure results for 2012 showed the widest variation of the parameters, with over 12 kPa variation between maximum and minimum values for both RON 95 and RON 98 petrol fuels.

Figure 12-3: Petrol analysis



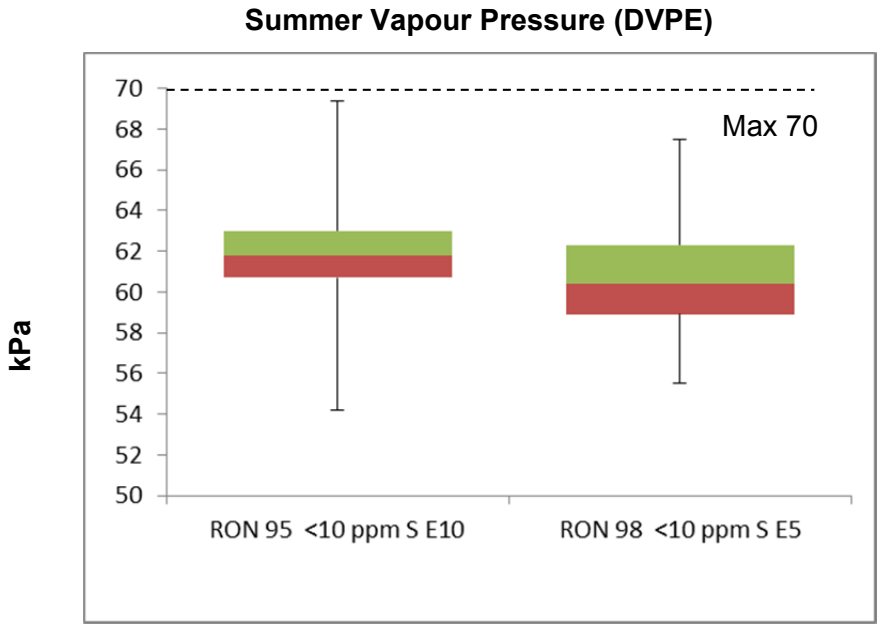
Note: Median and 25% of sample value equal 98.3 for RON for fuel Unleaded petrol (minimum RON >= 98

*Figure **12-3**: Petrol analysis **(continued)***



Note: Median and 25% of sample value equal 87 for MON for Unleaded petrol (minimum RON >= 98)

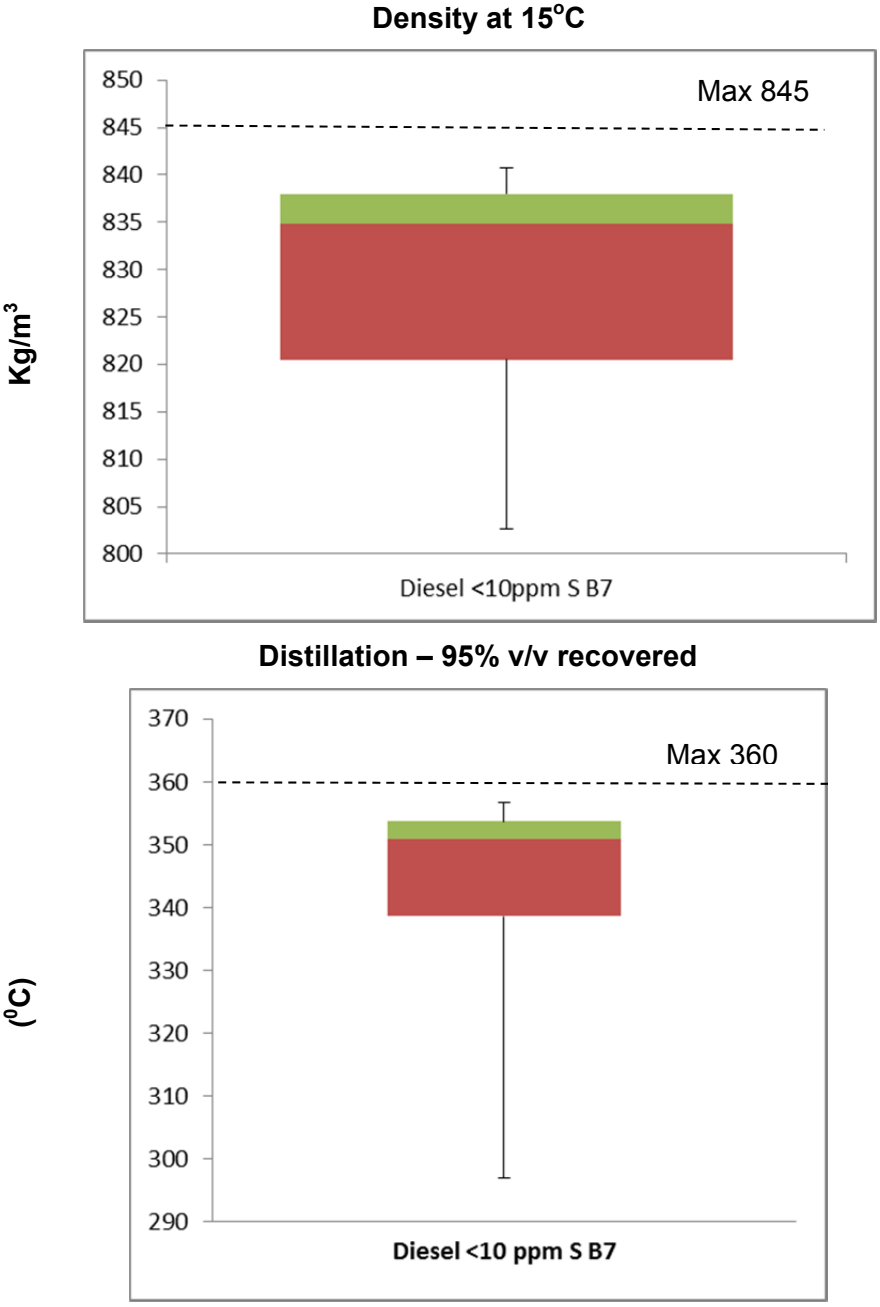
Median and 25% of sample value equal 85.3 for MON for Unleaded petrol (minimum RON >= 98)



12.4.2 Diesel Analysis

Diesel sample results for Density show a slightly wider variation, exhibited by the widely spread coloured bands at the 25 and 75 quartile. All samples of distillation remained within limit values and tolerance limits, but similar to results for Density give greater variation between maximum and minimum values, with the majority in the lower quartile (i.e. skewed away from the limit value).

Figure 12-4: Diesel analysis



12.5 Key Areas for Improvement

The following table summarises the main areas in which improvements could be made to the monitoring system, reporting or compliance with Directive limit values. The table includes key recommendations from the previous year to give an assessment of what action has been taken by the Member State to address any issues that may have been highlighted.

Key Areas for Improvement (3 years)		
Year	**Monitoring**	**Reporting**
2012	• Manganese has not been tested for in Finland in 2012. • Finland did not report parameter results for FAME Content for diesel fuel grade in 2012. However Finland has expressed plans to report the parameter from 2014 onwards.	• The Finnish report was received before the 30th June deadline and in the 2012 reporting template. • All information and relevant details required for the reporting period were provided for 2012.
2011	• Manganese has not been tested for in Finland in 2011. Suppliers have stated that no metallic additives are used in fuels on the market. • Finland did not report parameter results for FAME Content for diesel fuel grade in 2011. However Finland has expressed plans to report the parameter from 2013 onwards.	• The Finnish report was received before the 30th June deadline and in the 2011 reporting template. • All information and relevant details required for the reporting period were provided for 2011.
2010	• Low number of samples for cetane and octane	• No comment.

13 France

13.1 Fuel Availability 2012

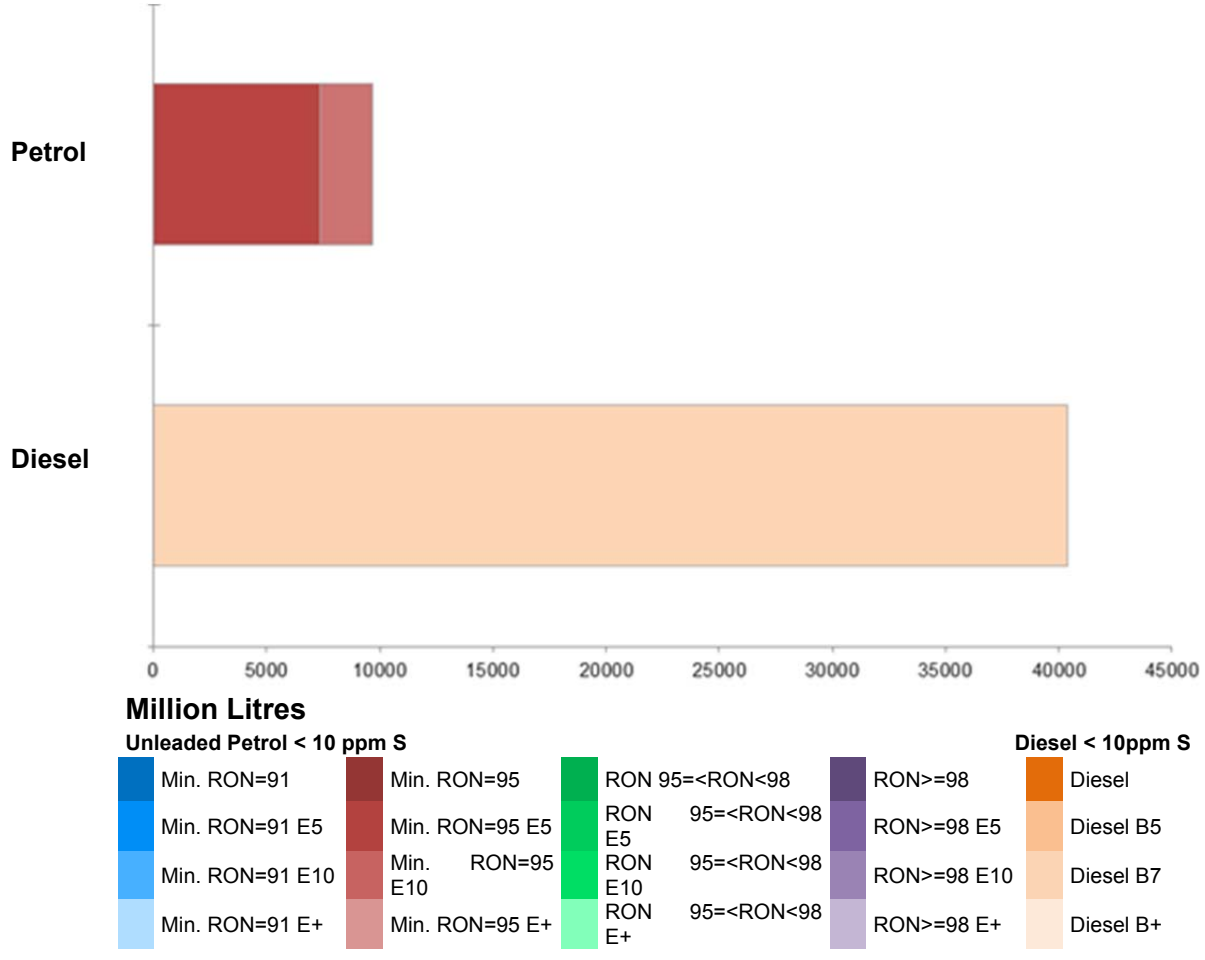
The following table lists the fuels that were reported to be available nationally in 2012.

Table 13-1: National fuel grade

Fuel grade	National fuel grade
Unleaded petrol (minimum RON = 95) E5	SP95/98
Unleaded petrol (minimum RON = 95) E10	SP95-E10
Diesel fuel B7	Gazole

13.1.1 Sales, sampling and reporting

Figure 13-1: Fuel Sales proportions by fuel type



In 2012, France has reported sales of two different petrol fuel grades; Unleaded petrol (minimum RON = 95) E5 at 75.9% market share and Unleaded petrol (minimum RON = 95) E10 with 24.1% of market share. Diesel dominated fuel sales in 2012 with sales of 40,378 million litres compared to combined petrol fuel sales of 9,666 million litres.

Table 13-2: Fuel sales and sampling

Fuel type (Parent Grade)	Sales (Million litres)	Sales % total of fuel type	Samples (1) S	Samples (1) W	Samples (1) TR (2)	Separate S/W(3)	Para-meters measured (4)	Add. Notes
Unleaded petrol min. RON=95 (<10 ppm S) E5	7,335	75.89%	208	200	200	Yes	19 of 19	(a)
Unleaded petrol min. RON=95 (<10 ppm S) E10	2,331	24.11%	31	34	200	Yes	19 of 19	
Total Petrol	**9,666**	**100.00%**	**239**	**234**	**400**	**Yes**	**19 of 19**	
Diesel (<10 ppm sulphur) B7	40,378	100.00%	208	200	200	Yes	6 of 6	
Total Diesel	**40,378**	**100.00%**	**208**	**200**	**200**	**Yes**	**6 of 6**	

(1) Samples — The actual number of samples taken by the Member State in the summer (s) and winter (w) periods

(2) TR — Total requirement per summer and winter period according to EN 14274. Brackets () show where a national model is being used, and the requirement is indicative to demonstrate equivalence with EN14274.

(3) Separate S & W? — Yes indicates separate summer & winter reporting, and No indicates full year sample results reporting only.

(4) Parameters measured — Currently 19 petrol parameters should be tested and reported by the Member States and 6 diesel parameters. France has reported results for all parameters in all fuel grades.

(a) Additional Notes — Two E5 petrol fuel grades have been reported in combination as French legislation defines fuels 95 and 98 as a single E5 fuel grade. SP98 is not a regulatory fuel grade in France (SP98 is a commercial ("premium") grade derived from SP95 regulatory grade).

13.1.1.1 Petrol Samples

- France met the minimum sampling requirements for petrol fuel grade in 2012.

13.1.1.2 Diesel Samples

- France met the minimum sampling requirements for diesel fuel grade in 2012.

13.2 Fuel Quality Monitoring 2012

13.2.1 Description of System

Responsible organisation(s)	Ministère de l'écologie, du développement durable et de l'énergie- Direction générale de l'énergie et du climat French Ministry for Ecology, Sustainable Development and Energy - General Directorate for Energy and Climate
Fuel Quality Monitoring System (FQMS)	EN 14274 Statistical model B. Model A is not used because the geographical layout of refineries and oil depots does not allow for the identification of macro-regions containing a number of very local sources, as required by the standard.
Country Size	Large

Summer Period	Normal
Location(s) of sampling	Service stations
Time/frequency of sampling	Unleaded petrol min. RON=95 (<10 ppm S) E5 and Unleaded petrol min. RON=95 (<10 ppm S) E10 were reported over 12 and 10 months respectively in 2012, with an even spread between summer and winter periods. Diesel fuel (<10 ppm sulphur) B7 was reported over 11 months, with an even spread between summer and winter periods.
Specification of test methods	For some parameters listed below, France used updated version of test methods and used the Reproducibility associated to these updated test methods version . This has been taken into account during the report sample compliance analysis, and details have been provided, as below: Petrol: • Distillation has been tested using updated 2011 test methods. • Manganese has been tested using EN 16136: 2010.
Collection of sales data	Sales data was provided by the Directorate General of Customs in 2012.

Other details

For SP95 and SP98 E5 petrol fuels, it was decided to sample the fuel available in the controlled service stations (SP95 or SP98). This choice is justified by the market development of SP95-E10 petrol fuel, which gradually replaces either SP95 or SP98 petrol fuel in service stations. The controls on the RON and MON are those which apply respectively to fuel taken.

13.1.1 Fuel Quality Monitoring System

13.1.1.1 Sampling

The provider who performs the sampling and analysis on behalf of the Directorate General for Energy and Climate (DGEC) is Intertek OCA France, selected by European tender. The contract started in 2011 for a maximum period of 4 years.Intertek OCA France, who is in charge of monitoring and analysis, is audited once a year by DGEC.DGEC is responsible for reporting on the basis of data supplied by the provider.

The controls are carried out throughout the country and concern petrol fuels (called “supercarburants” in French) and diesel fuel (called “gazole” in French). The objective of the controls is to verify that fuels meet regulatory requirements, as close to the customers.

The controls are made at the service station. Service stations are drawn by DGEC from a listing of French service stations, updated every year.

According to EN 14274:2003 standard, France provides an average annual number of 400 samples for each type of road fuel sold on its territory (200 samples during summer period and 200 during winter period). SP95-E10 petrol fuel is sampled proportionally to its market share (E10 petrol was launched in 2009 and its market share is gradually increasing). Some E85 fuel samples are also collected.

The sampling campaigns in service-stations are spread over a calendar year. They are organized by quarterly programs except for Overseas Territories, where the sampling campaign is once a year, because of the absence of seasonality in these territories (summer all the year).

Administrative regions where controls occur during the summer of year N, are controlled during the winter period of year N +1.

13.1.1.2 FQMS administration

DGEC is responsible for the implementation of the European Directives on fuel quality and sulphur content of marine fuels as well as the implementation of the quality monitoring system (FQMS).

The objective of controls is to verify that fuels meet regulatory requirements, as close to the customers. When a non-compliance on a fuel sample is detected, DGEC notifies the retailer and asks for explanation and for corrective and preventive actions to be taken. If necessary during a campaign, DGEC may expressly request additional sampling and analyses.

The General Directorate for Competition, Consumption and Repression of Fraud (DGCCRF) can make specific intervention and reports violations. In case of serious or repeated deviations, the DGCCRF is formally notified.

Under Articles 3.2.2 and 5.3.3 of EN 14274:2003 standard, France is ranked as a Large country and corresponds to the model B. Indeed, the annual fuel sales are more than 15 million tons. The Model A was not chosen because the geographical layout of refineries and oil depots does not define macro-regions containing a number of sources of supply very close, as required by the standard.

Controlled areas are the 22 metropolitan administrative regions and administrative French overseas territories: Martinique, Guadeloupe, French Guiana, La Reunion.

In 2012, France had 11 refineries (including one in Martinique). 10 refineries were in operation in 2012.

In 2012, France had 198 oil depots with a capacity over 400 m^3.

13.1.1.3 National Legislation that transposed the FQD

Requirements for fuel quality, defined in the Fuel Quality Directive 2009/30/EC amending 98/70/CE, have been implemented in ministerial orders relating to the characteristics of the fuel (a specific ministerial order for each fuel) and decisions laying down the test methods for the fuel characteristics/parameters.

Ministerial orders and decisions are modified as necessary according to the evolution of Directive 98/70/EC(Directive 2011/63/CE is the latest evolution of 98/70/EC Directive).

13.1.1.4 Reporting periods

Summer: 1st May – 30th September

Winter:1st October – 30th April

For diesel fuel, there is no regulatory transition period between summer and winter.

For petrol, the regulatory transition periods (inter-season) are as follows: from 16th March to 30th April and from 1st to 31st October.

13.2.2 Compliance with Fuel Quality Limit Values

Table 13-3: Petrol Fuel Grades

SP95 - SP98 Petrol - Details of samples that exceed tolerance limits:					
Parameter	**Limit Value**	**Tolerance Limit* (TL)**	**Max/Min value of samples tested**	**No samples outside TL**	**% samples outside TL**
Sulphur content, mg/kg	10	11.6	45.2	6	1.47%
Vapour pressure kPa	60	61.38	71.3	10	2.45%
Member State notes: -					
SP 95 – E10 Petrol - Details of samples that exceed tolerance limits:					
No samples exceeded tolerance limits.					

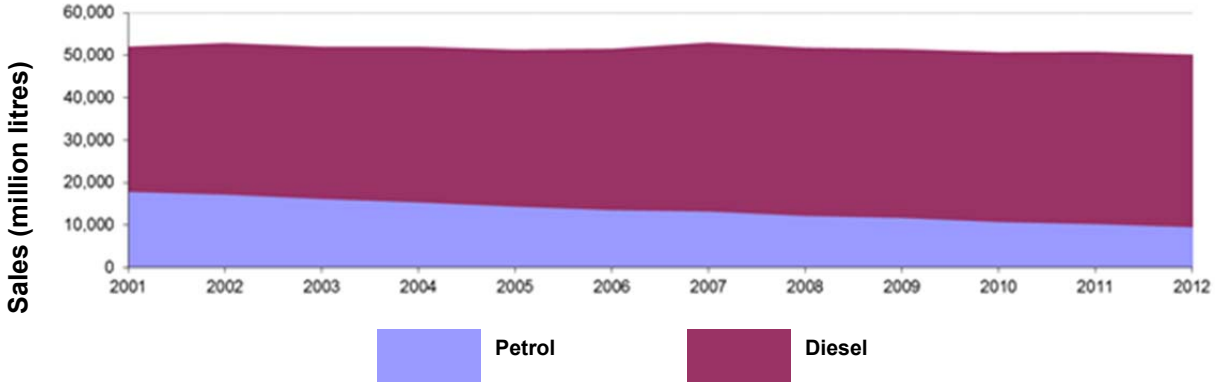
Table 13-4: Diesel Fuel Grades

Diesel - Details of samples that exceed tolerance limits:					
Parameter	**Limit Value**	**Tolerance Limit* (TL)**	**Max/Min value of samples tested**	**No samples outside TL**	**% samples outside TL**
Cetane number	51	48.5	48,1	1	0.25%
Distillation – 95% Point	360	365.9	366,1	1	0.39%
Sulphur content, mg/kg	10	11.3	15,416	10	2.45%
FAME Content	7	7.53	9,510	16	3.92%
Member State notes: -					

13.3 Temporal Trends

Figure 13-2 shows the trend in total fuel sales since 2001. Petrol fuel sales have decreased by 6.9% in the period 2011 to 2012 following the steady decline since 2001; there has been an 86% reduction from 2001 to 2012, from 17,974 million litres to 9,666 million litres. Diesel fuel sales have fluctuated marginally, however has, by contrast increased during the same period with diesel fuel sales in 2001 (33,944 million litres) increasing by 15.9% to 40,378 million litres in 2012. Between 2011 and 2012, diesel fuel sales have marginally increased, by 0.1%.

Figure 13-2: Temporal trends in national sales of petrol and diesel (million litres)



13.4 Statistical Analysis

The following charts in this section are known as box-plots and they display the distribution of fuel characteristics per Member State by illustrating the:

- Sample minimum
- Lower 25% range
- Middle 50% range
- Median
- Upper 25% range
- Maximum

For a full explanation of the information presented in a Box Plot diagram, please see Section 4 of the wider report.

Fuel sampling in France in 2010 recorded relatively few test results out of specification with limits. The analysis charts for petrol (Figure 13-3) and diesel (Figure 13-4) detail the distribution of sample results for the 5 selected parameters;

Petrol:

- Research Octane Number
- Motor Octane Number
- Summer Vapour Pressure

Diesel:

- Density at 15^{o}C
- Distillation – 95% v/v recovered

Sample results for these parameters have been depicted using box plots based on the reported sample minimum, lower quartile (Q1), median (Q2), upper quartile (Q3), and the maximum sample value.

13.4.1 Petrol Analysis

Sample results in 2012, based on combined reporting of fuel grades RON=95 (<10 ppm S) E5, RON=95 (<10 ppm S) E+ and RON>=98 (<10 ppm S) E5 are presented in the chart below under the lowest fuel grade (RON 95 <10ppm S E5). RON 95 < 10ppm S E10 has been reported separately. Due to combined reporting of fuel grades RON 95 and RON 98, the results may be skewed and not accurately representative of the fuel quality conditions for the different fuel grades. However, based on the charts below, it can be observed that parameter MON, remains tighter to specifications that RON. The analysis of DVPE shows a high degree of variance in the samples as well as outliers being not compliance.

Figure 13-3: Petrol analysis

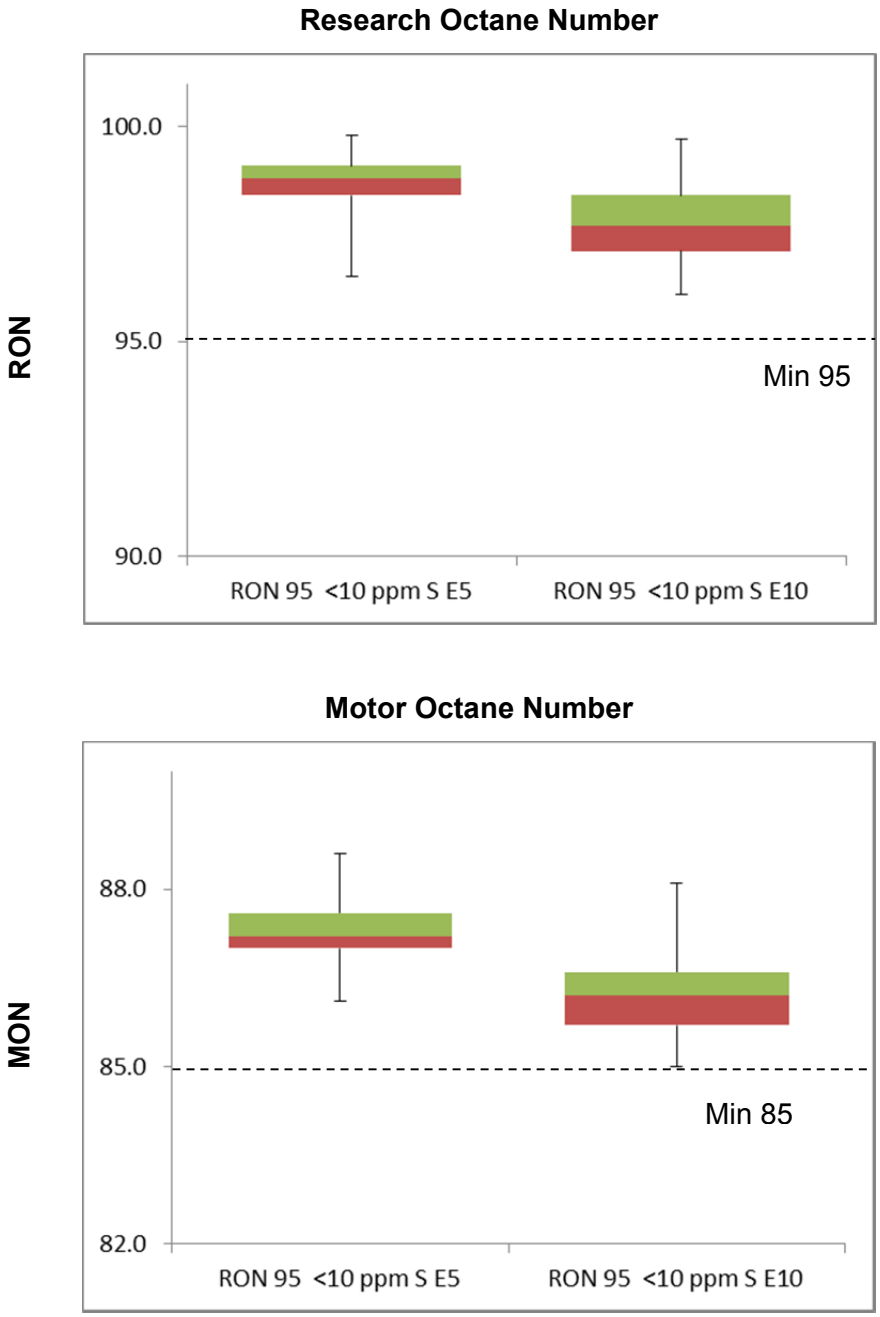
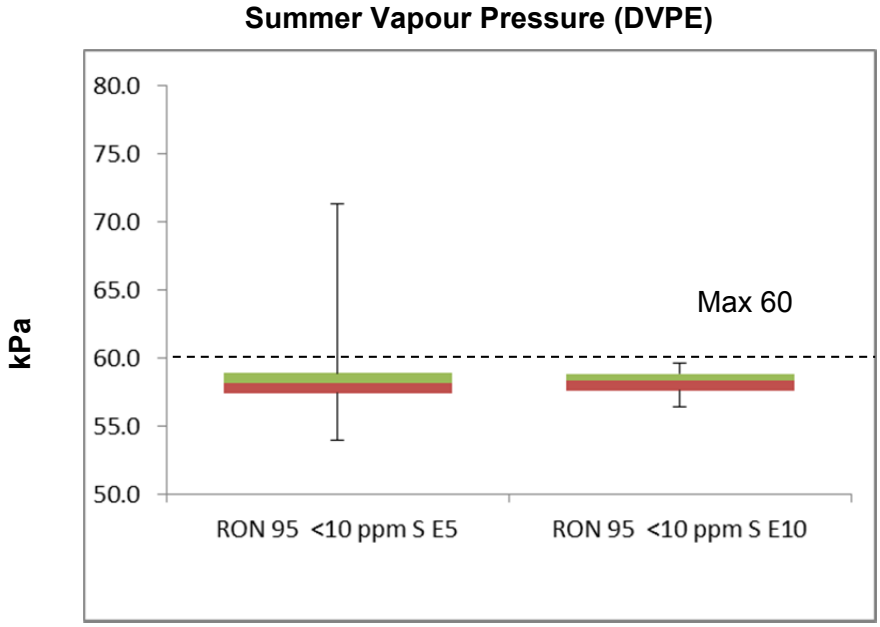


Figure 13-3: Petrol analysis (continued)



13.4.2 Diesel Analysis

Sample results for diesel demonstrate that sample results for the parameters are less tight to specification. The majority of samples remain comfortably within specification (as demonstrated by the coloured bands), however some outliers do exceed limit values for density and distillation.

Figure 13-4: Diesel analysis

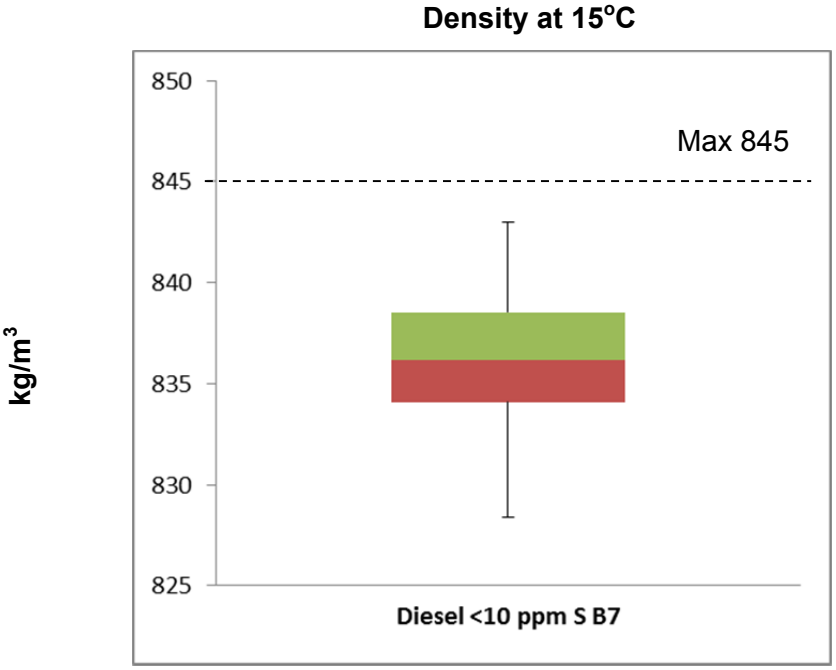
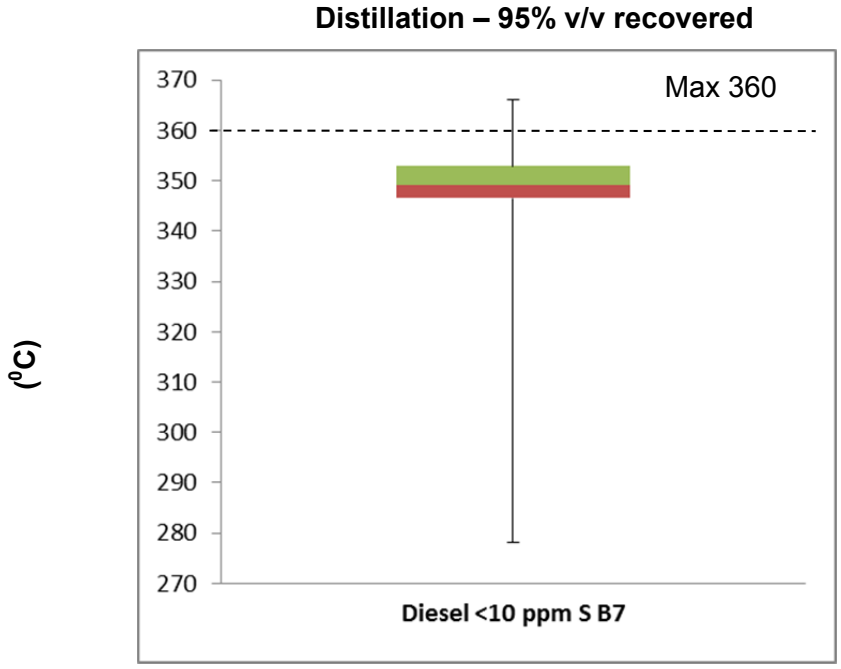


Figure 15-4: Diesel analysis (continued)



13.5 Key Areas for Improvement

The following table summarises the main areas in which improvements could be made to the monitoring system, reporting or compliance with Directive limit values. The table includes key recommendations from the previous year to give an assessment of what action has been taken by the Member State to address any issues that may have been highlighted.

Key Areas for Improvement (3 years)		
	Monitoring	**Reporting**
2012	• The results for petrol SP 95 and SP 98 were reported together • Monitoring of Unleaded petrol min. RON=95 (<10 ppm S) E10 petrol grade have not fulfilled requirements of the Directive. In future years, an increase in the level of sampling for RON 95 E10 will be required in order to maintain compliance, as sales in 2012 were above 10% of the total petrol market.	• France submitted the 2012 report within Member State deadline.
2011	• In future years, an increase in the level of sampling for RON 95 E10 will be required in order to maintain compliance, as sales in 2011 were above 10% of the total petrol market. For 2011, RON95 E10 summer and winter period samples did not comply with minimum sampling requirements	• France submitted the 2011 report within Member State deadline. • There is insufficient historical petrol sales information regarding petrol grade samples to determine compliance.

Key Areas for Improvement (3 years)		
	Monitoring	**Reporting**
	as set out in EN 14274. • Monitoring of other petrol and diesel grades appears to have fulfilled requirements of the Directive.	
2010	• Diesel parameter Density at 15^0C was not reported.	• No comment.

14 Germany

14.1 Fuel Availability 2012

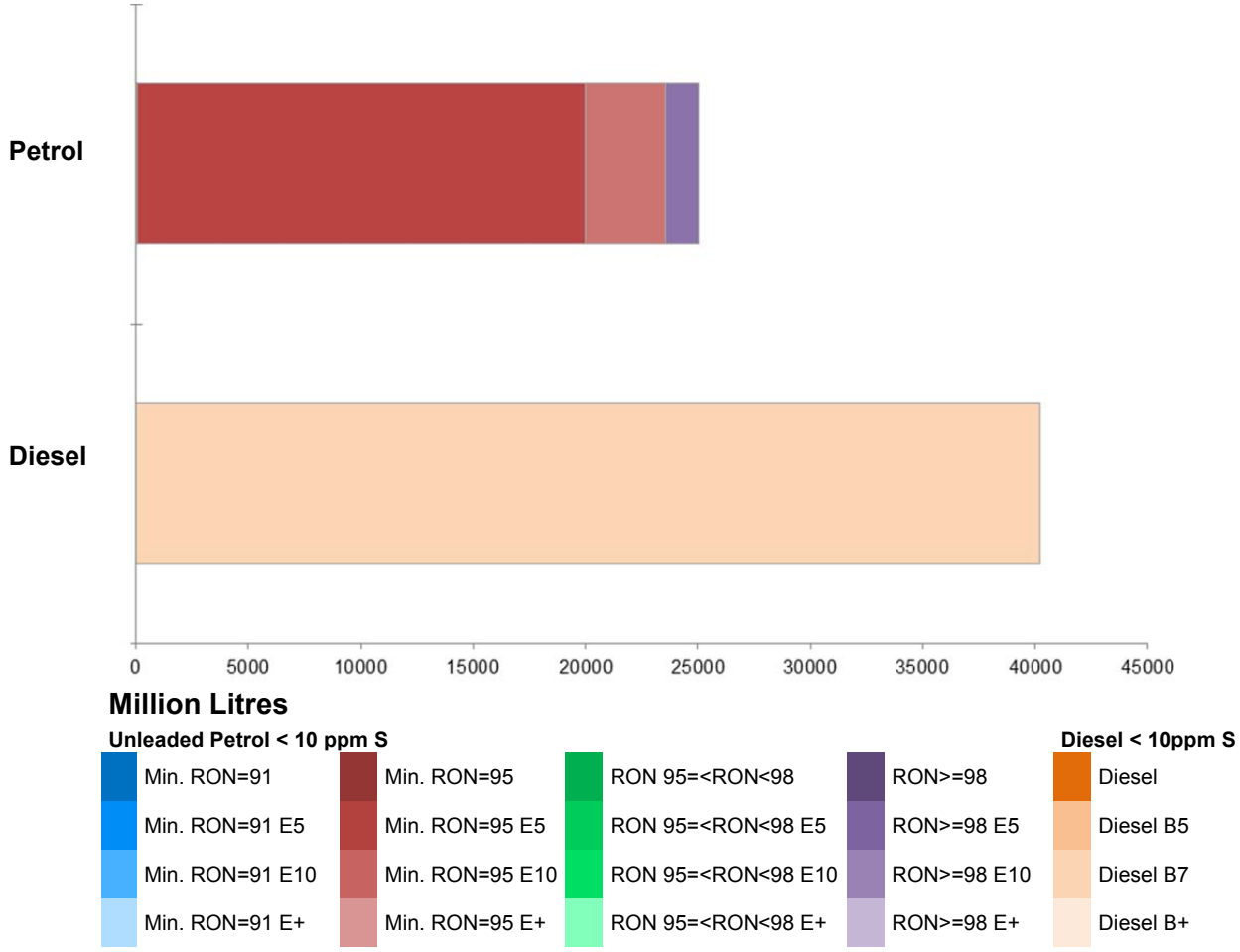
The following table lists the fuels that were reported to be available nationally in 2012.

Table 14-1: National fuel grade

Fuel grade	National fuel grade
Regular unleaded petrol (minimum RON = 91)	Normal
Unleaded petrol (minimum 95 =< RON < 98) E5	Super
Unleaded petrol (minimum RON = 95) E10	Super E10
Unleaded petrol (minimum RON >= 98) E5	Super Plus
Diesel fuel B7 and B5	Dieselkraftstoff

14.1.1 Sales, sampling and reporting

Figure 14-1: Fuel Sales proportions by fuel type



During 2012 fuel sales in Germany were dominated by diesel fuel; 40,232 million litres of diesel were sold in comparison to 25,031 million litres of petrol (all petrol grades combined). Petrol fuel sales were mainly comprised (80%) of Super fuel grade. Diesel available on the market in Germany contains biofuel content of up to 7%.

Table 14-2: Fuel sales and sampling

Fuel type (Parent Grade)	Sales (Million litres)	Sales % total of fuel type	Samples (1) S	Samples (1) W	Samples (1) TR (2)	Separate S/W(3)	Para-meters measured (4)	Add. Notes
Unleaded petrol min. RON=91 (<10 ppm S) E5	50	0.20%	0	0	1	No	n/a	
Unleaded petrol 95=<RON<98 (<10 ppm S) E5	19,934	79.63%	192	213	200	Yes	19 of 19	
Unleaded petrol 95=<RON<98 (<10 ppm S) E10	3,545	14.16%	50	89	200	Yes	19 of 19	
Unleaded petrol RON>=98 (<10 ppm S) E5	1,502	6.00%	30	28	13	Yes	19 of 19	
Total Petrol	**25,031**	**100.00%**	**272**	**330**	**414**	**Yes**	**19 of 19**	
Diesel (<10 ppm sulphur) B5	0%	0%	4	6	0	Yes	6 of 6	
Diesel (<10 ppm sulphur) B7	40,232	100.00%	177	228	200	Yes	6 of 6	
Total Diesel	**40,232**	**100.00%**	**181**	**234**	**200**	**Yes**	**6 of 6**	

(1)	Samples	The actual number of samples taken by the Member State in the summer (s) and winter (w) periods
(2)	TR	Total requirement per summer and winter period according to EN 14274. Brackets () show where a national model is being used, and the requirement is indicative to demonstrate equivalence with EN14274.
(3)	Separate S & W?	Yes indicates separate summer & winter reporting, and No indicates full year sample results reporting only.
(4)	Parameters measured	Currently 19 petrol parameters should be tested and reported by the Member States and 6 diesel parameters.
(a)	Additional Notes	The actual number of samples taken by the Member State in the summer (s) and winter (w) periods

14.1.1.1 Petrol Samples

Germany is a large country using statistical model B. The sampling requirements are 200 samples in each period (summer and winter). The requirements have not been met for any petrol fuel grade except Ron 98 (Super Plus), which has met minimum sampling requirements due to the proportionate sales of this fuel grade.

14.1.1.2 Diesel Samples

Germany has not met the minimum sampling requirements of 200 samples per period for Diesel fuel grades.

14.2 Fuel Quality Monitoring 2012

14.2.1 Description of System

Responsible organisation(s)	Umweltbundesamt
Fuel Quality Monitoring System (FQMS)	EN14274 Statistical Model B
Country Size	Large
Summer Period	Normal
Location(s) of sampling	All samples were taken from service stations.
Time/frequency of sampling	RON 95 E5 (Super) and RON 98 (Super Plus) were sampled over 11 months (not April), whilst RON 95 E10 (Super 10) was sampled over 10 months (not April or June). Diesel B5 was only sampled over 4 months, whilst Diesel B7 was sampled over 11 months (not April).
Specification of test methods	Information on test methods used was provided in the reporting template.
Collection of sales data	Federal Office of Economics and Export Control: Official oil data for the Federal Republic of Germany.

Other details: Referring to DIN EN 14274-2003 (D) Germany uses the monitoring system model B (non-macro regions) for a large country. The number of the regions is 16 based on the 16 federal states of Germany.

Thus, the minimum number of samples of each period is 200. DIN EN 14274-2003 (D) defines number of samples for each of these regions. The fixed distribution of these samples regarding the states is reported on the sheets for the regional petrol sampling of this template.

14.2.2 Fuel Quality Monitoring Service

14.2.2.1 Sampling

The sampling was carried out at refuelling stations only.

Selection of the sampling points is the responsibility of each government of the 16 German states, and differs from state to state.

The test methods used to sample the different parameters are presented on the datasheets.

14.2.2.2 FQMS Administration

The organizations responsible for the sampling at regional level are the 16 governments of the federal states. The results of the regional sampling are forwarded to the Umweltbundesamt (Federal Environment Agency – UBA), where data are collected and subsequently consolidated into a report.

The management of the fuel sampling differs from state to state. Some of the states prefer government agencies to carry out the sampling; others use private contractors. The sampling data of each of the states has to be reported to UBA until 30th April of the following year.

The governments of the German states and/or the lower-ranking government agencies are responsible for taking action in case of non-compliant samples.

The design of the system was defined in DIN EN 14274-2003 (D). It was adopted into legislation by the German Tenth Ordinance Implementing the Federal Immission Control Act (10th BImSchV) in 2008 (see section 14.2.2.3).

The number of refineries in Germany is 13.

The number of refuelling stations in Germany was about 14,300 at the end of 2012.

14.2.2.3 National Legislation that Transposed the FQD

The elements of the Directive are transposed into the German "Zehnte Verordnung zur Durchführung des Bundesimmissionsschutzgesetzes (Verordnung über die Beschaffenheit und Auszeichnung der Qualitäten von Kraft- und Brennstoffen – 10. BImSchV)" i.e. Tenth Ordinance Implementing the Federal Immission Control Act (Tenth BImSchV).

14.2.2.4 Reporting Periods

The summer period starts 1st May and ends 30th September. The winter summer period starts 16th November and ends 15th March. Transition periods are from 1st October to 15th November and 16th March to 30th April.

Samples could to be taken during the whole year, preferably in the summer or winter period.

14.2.3 Compliance with Fuel Quality Limit Values

Table 14-3: Petrol Fuel Grades

Petrol RON 91, Normal - Details of samples that exceed tolerance limits:					
No samples were taken. No samples have been available at service stations.					
Petrol RON 95, Super E5 - Details of samples that exceed tolerance limits:					
Parameter	**Limit Value**	**Tolerance Limit* (TL)**	**Max/Min value of samples tested**	**No samples outside TL**	**% samples outside TL**
Summer vapour pressure, kPa	60	61.7	68.9	2	1.04%
Samples exceeding national limits were found for Ethanol and Distillation at 100 °C, however these did not exceed requirements in Directive 2009/30/EC. In the rare cases of non-compliant samples, respective authorities imposed administrative penalties and/or issued letters of warning.					
Petrol RON 95, Super E10 - Details of samples that exceed tolerance limits:					
Parameter	**Limit Value**	**Tolerance Limit* (TL)**	**Max/Min value of samples tested**	**No samples outside TL**	**% samples outside TL**
Oxygen Content	2.7	2.9	4.67	1	1.04%
Methanol	3	3.2	11	1	1.01%
Member State notes Samples exceeding national limits were found for Ethanol, however these did not exceed requirements in Directive 2009/30/EC. In the rare cases of non-compliant samples, respective authorities imposed administrative penalties and/or issued letters of warning.					
Petrol RON 98, Super Plus - Details of samples that exceed tolerance limits:					
Parameter	**Limit Value**	**Tolerance Limit* (TL)**	**Max/Min value of samples tested**	**No samples outside TL**	**% samples outside TL**
Summer vapour pressure, kPa	60	61.7	61.9	1	3.70%
Member State notes In the rare cases of non-compliant samples, respective authorities imposed administrative penalties and/or issued letters of warning.					

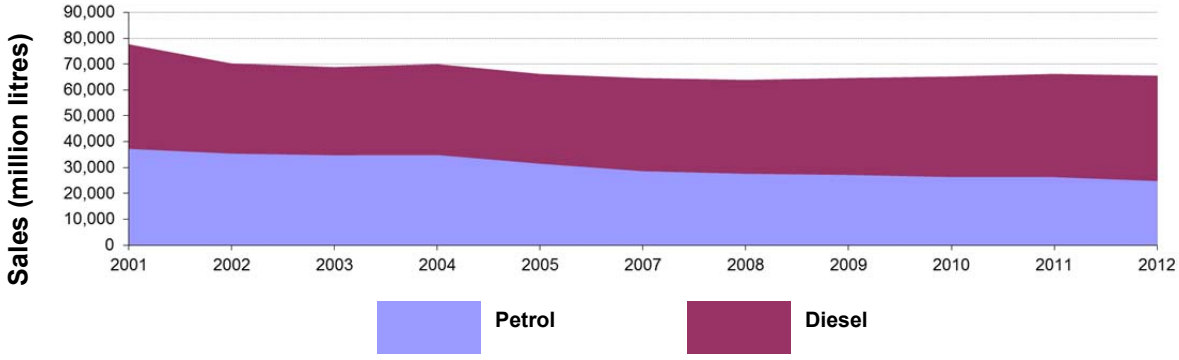
Table 14-4: Diesel Fuel Grades

Diesel B5 - Details of samples that exceed tolerance limits:					
No samples were found to be out of compliance with Directive specifications.					
Diesel B7 - Details of samples that exceed tolerance limits:					
Parameter	**Limit Value**	**Tolerance Limit* (TL)**	**Max/Min value of samples tested**	**No samples outside TL**	**% samples outside TL**
FAME content	7.3	7.53	10	1	0.26%
Member State notes In the rare cases of non-compliant samples, respective authorities imposed administrative penalties and/or issued letters of warning.					

14.3 Temporal Trend

Figure 14-2 shows the trend in total fuel sales since 2001; between 2001 and 2012 there has been a decline in Petrol sales of 12,441 million litres (49.7%), whilst diesel sales have fluctuated but slightly increased by 301 million litres (0.7%). Between 2011 and 2012 petrol sales have decreased by 1,509 million litres (5.7%), whilst diesel sales have increased by 801 million litres (2.1%).

Figure 14-2: Temporal trends in national sales of petrol and diesel (million litres)



14.4 Statistical Analysis

The following charts in this section are known as box-plots and they display the distribution of fuel characteristics per Member State by illustrating the:

- Sample minimum
- Lower 25% range
- Middle 50% range
- Median
- Upper 25% range
- Maximum

For a full explanation of the information presented in a Box Plot diagram, please see section 4.

Fuel sampling in Germany in 2012 recorded only a few test results out of specification with limit values. The analysis charts for petrol (Figure 14-3) and diesel (Figure 14-4) detail the distribution of sample results for the 5 selected parameters;

Petrol:

- Research Octane Number
- Motor Octane Number
- Summer Vapour Pressure

Diesel:

- Density at 15°C
- Distillation – 95% v/v recovered

Sample results for these parameters have been depicted using box plots based on the reported sample minimum, lower quartile (Q1), median (Q2), upper quartile (Q3), and the maximum sample value.

14.4.1 Petrol Analysis

Sample results in 2012 have been presented in the following figures with limit values for the parameter (maximum or minimum) to demonstrate the skew of sample results. RON and MON sample results show parameters are very tight to specification with a small number exceeding the limit values, but not tolerance limits. The vapour pressure samples show a distribution that is tight to specification for all grades with a few samples over the tolerance limits.

Figure 14-3: Petrol analysis

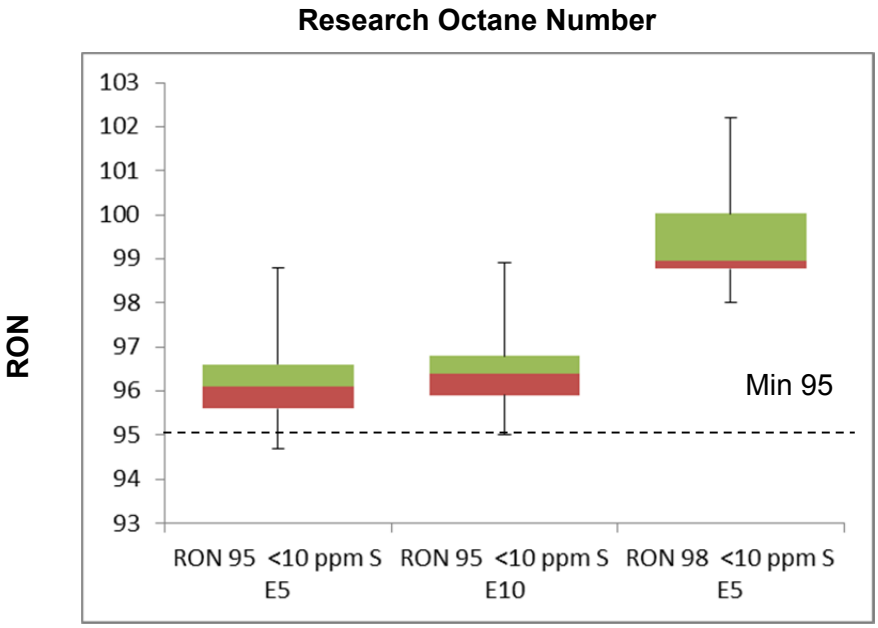
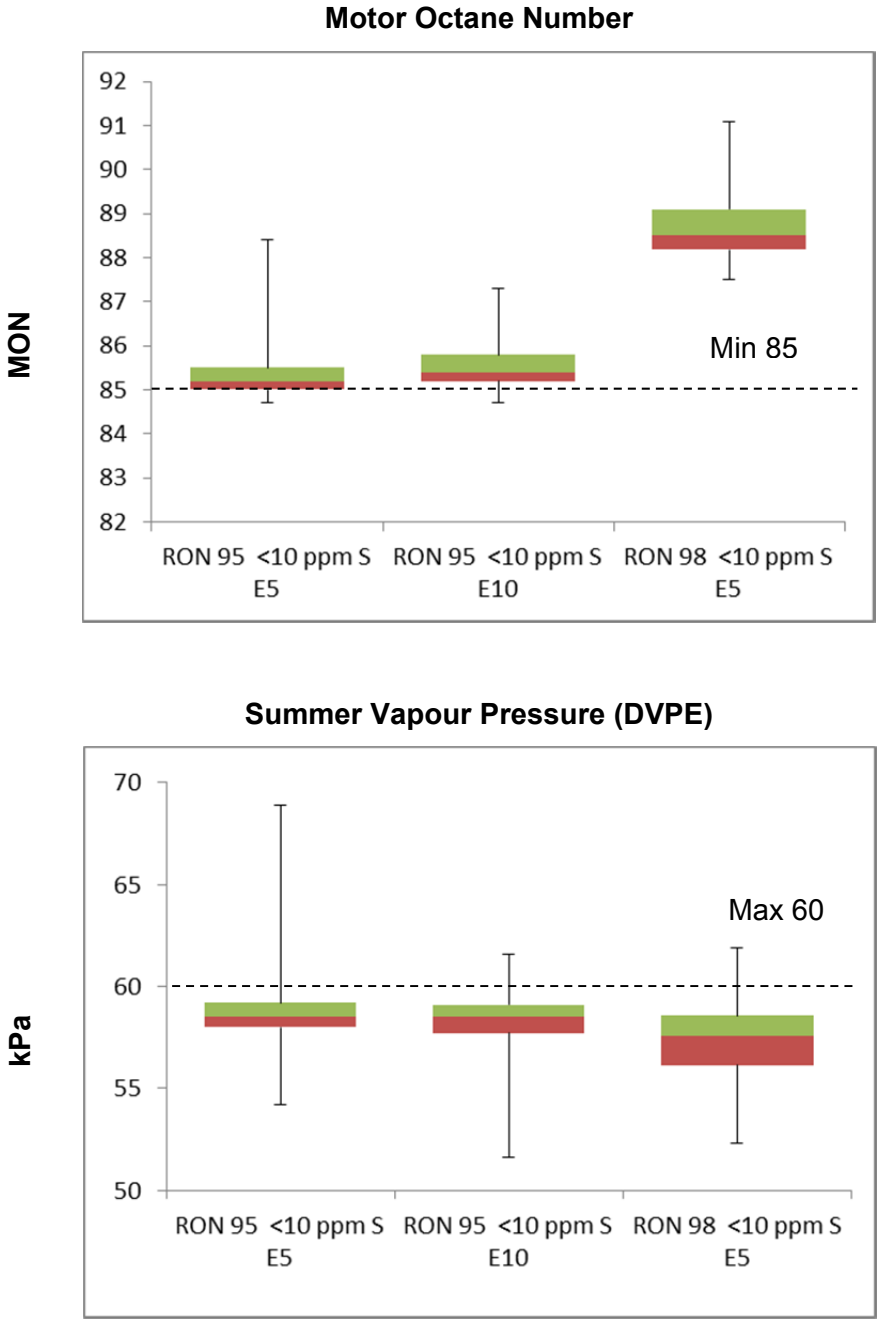


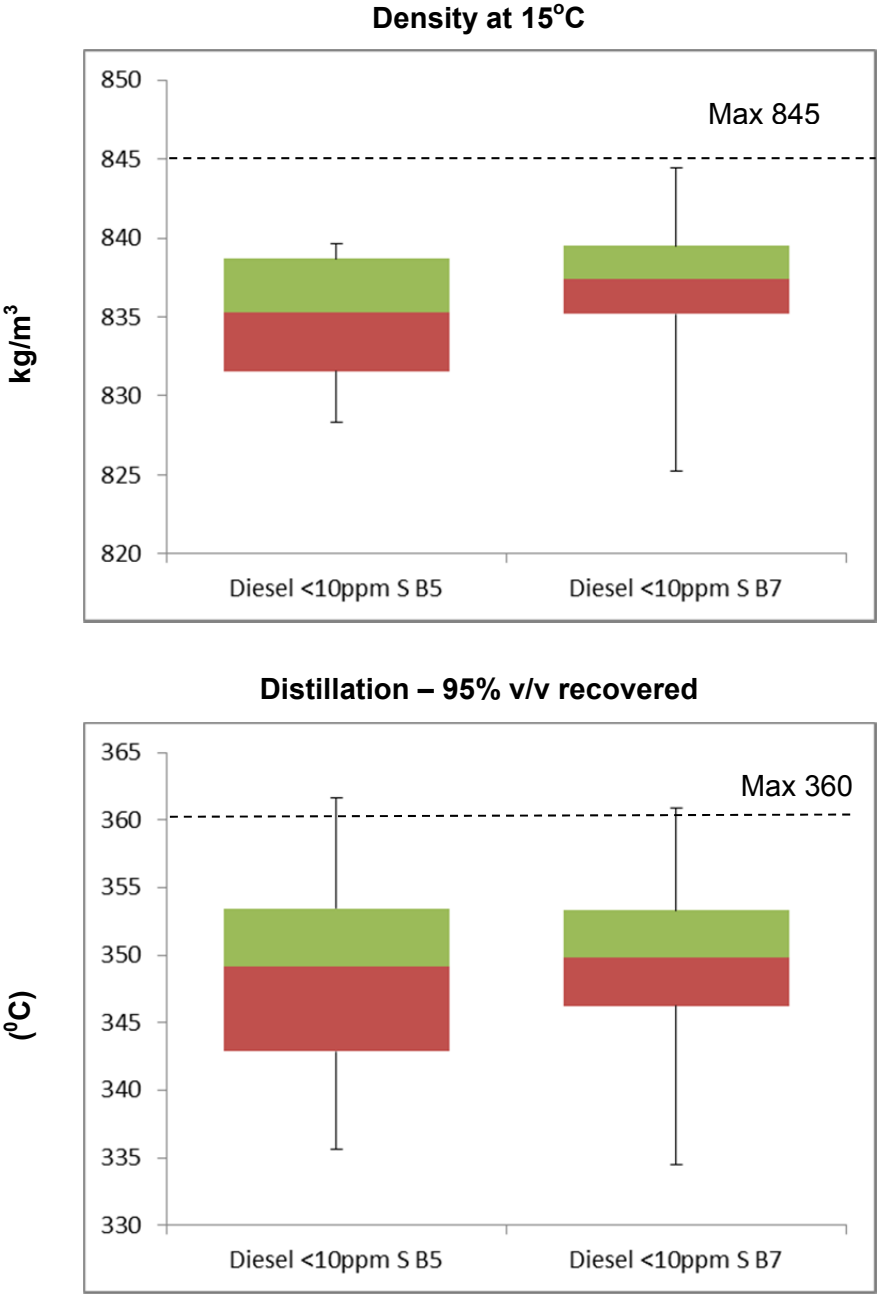
Figure 14-3: Petrol analysis (continued)



14.4.2 Diesel Analysis

Sample results for diesel demonstrate that sample results for the parameters are less tight to specification with a wider variation in density, exhibited by the widely spread coloured bands at the 25 and 75 quartile. Distillation results show a few samples exceed limit values, but are within tolerance limits.

Figure 14-4: Diesel analysis



14.5 Key Areas for Improvement

The following table summarises the main areas in which improvements could be made to the monitoring system, reporting or compliance with Directive limit values. The table includes key recommendations from the previous year to give an assessment of what action has been taken by the Member State to address any issues that may have been highlighted.

Key Areas for Improvement (3 years)		
	Monitoring	**Reporting**
2012	• Sampling requirements have not been met for RON=95 E10 either in summer or winter periods. Also the	The report was submitted 19th August in the EC approved

Key Areas for Improvement (3 years)		
	Monitoring	**Reporting**
	sampling requirement for RON 95 during the summer period was not met.	template provided.
2011	• Two different sampling methodologies have been used in 2011. Whilst this leads to uncertainty as to how many samples were actually taken, from the evidence supplied it appears that Germany has not complied with the minimum sampling requirements for petrol or diesel fuel grades.	The 2011 report was submitted within Member State deadline, though not in the EC approved template provided. Germany did not use the EC approved template, possibly due to the use of multiple methodologies as outlined above. They were one of only two Member States not to use the template in the 2011 reporting year.
2010	• No information provided on statistical equivalence of national system. • Slightly low sample quantities for fuels with higher market share.	• Report more than 3 months late. • Results not reported separately for summer and winter periods. • Report not provided in the EC approved template. • No additional detail provided in 2010 for further analysis.

15 Greece

15.1 Fuel Availability 2012

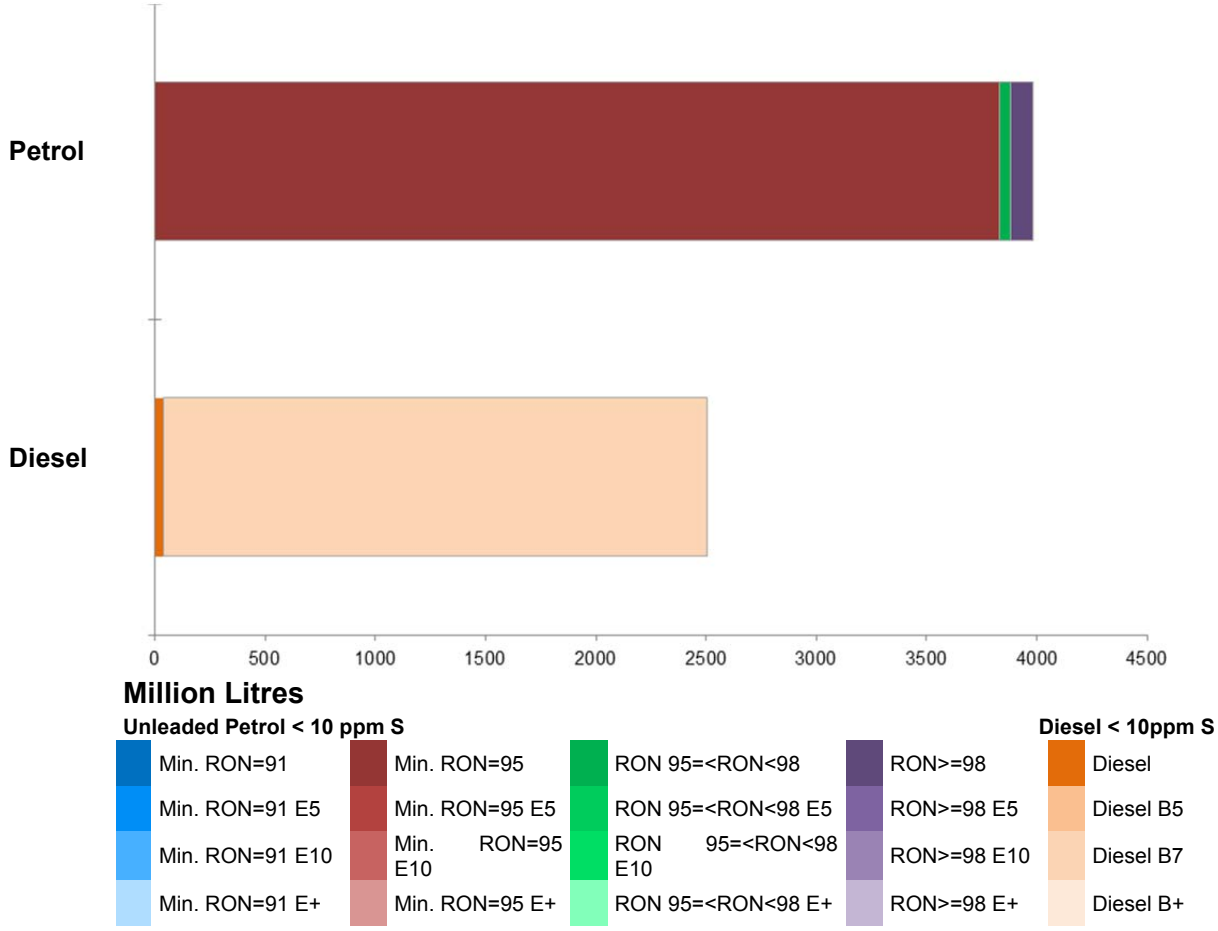
The following table lists the fuels that were reported to be available nationally in 2012.

Table 15-1: National fuel grade

Fuel grade	National fuel grade
Unleaded petrol (minimum RON = 95)	95 RON
Unleaded petrol (minimum 95 =< RON < 98)	LRP (96 RON)
Unleaded petrol (minimum RON >= 98)	Super unleaded (100 RON)
Diesel fuel B7	Diesel

15.1.1 Sales, sampling and reporting

Figure 15-1: Fuel Sales proportions by fuel type



During 2012 fuel sales in Greece were dominated by Petrol fuel sales, which is in stark contrast to most of the Member States; 3,935 million litres of petrol (all petrol grades combined) was sold in comparison to 2,506 million litres of diesel. Petrol fuel sales were mainly comprised (96.1%) of fuel grade RON 95.

Table 15-2: Fuel sales and sampling

Fuel type (Parent Grade)	Sales (Million litres)	Sales % total of fuel type	Samples (1) S	Samples (1) W	Samples (1) TR (2)	Separate S/W(3)	Para-meters measured (4)	Add. Notes
Unleaded petrol min. RON=95 (<10 ppm S)	3,831	96.15%	50	50	50	Yes	13 of 19	(a)
Unleaded petrol 95=<RON<98 (<10 ppm S)	52	1.30%	3	3	1	Yes	13 of 19	(a)
Unleaded petrol RON>=98 (<10 ppm S)	102	2.56%	5	5	2	Yes	13 of 19	(a)
Total Petrol	**3,985**	**100%**	**58**	**58**	**53**	**Yes**	**13 of 19**	
Diesel (<10 ppm sulphur)	39	1.57%	3	3	1	Yes	6 of 6	
Diesel (<10 ppm sulphur) B7	2,466	98.43%	50	50	50	Yes	6 of 6	
Total Diesel	**2,466**	**98.43%**	**53**	**53**	**51**	**Yes**	**6 of 6**	

(1) Samples — The actual number of samples taken by the Member State in the summer (s) and winter (w) periods

(2) TR — Total requirement per summer and winter period according to EN 14274. Brackets () show where a national model is being used, and the requirement is indicative to demonstrate equivalence with EN14274.

(3) Separate S & W? — Yes indicates separate summer & winter reporting, and No indicates full year sample results reporting only.

(4) Parameters measured — Currently 19 petrol parameters should be tested and reported by the Member States and 6 diesel parameters.

(a) Additional Notes — MMT is not added to fuels.
The only oxygenate added to petrol in refineries is MTBE.
Oxygenated substances in petrol such as Methanol, Iso-propyl alcohol, Tert-butyl alcohol, Iso-butyl alcohol are not detected by the mid-IR method used. Manganese not measured.

15.1.1.1 Petrol Samples

- Greece has not complied with the minimum sampling requirements for petrol fuel grades. The sampling requirement applies to fuel stations; only 73 of the 116 samples for petrol were taken from service stations.

15.1.1.2 Diesel Samples

- Greece has not complied with the minimum sampling requirements for diesel fuel grades. The sampling requirement applies to fuel stations; 53 of the 106 samples were taken from service stations.

15.2 Fuel Quality Monitoring 2012

15.2.1 Description of System

Responsible organisation(s)	General Chemical State Laboratory, Directorate of Petrochemicals
Fuel Quality Monitoring System (FQMS)	EN 14274 Statistical model A
Country Size	Small
Summer Period	Normal
Location(s) of sampling	Service stations and refineries
Time/frequency of sampling	Samples were taken throughout the year for RON 95 and diesel. Samples were taken over 6 months for RON 100 and LRP.
Specification of test methods	The laboratories monitor compliance with the requirements of the Decision No. 316/2010 relating to petrol and diesel fuels, based on analytical methods which are set out in the ELOT EN 228 and ELOT EN 590 standards respectively.
Collection of sales data	The Ministry of Environment Energy and Climate Change is responsible for reporting fuel sales.
Other details	

15.2.2 Fuel Quality Monitoring System

15.2.2.1 Sampling

Greece is classified as a small country under criteria in Article 3.2 of the ELOT EN 14274 standard, taking into account fuel sales levels. Model A applies to Greece. In order to plan fuel sampling activities, the country is divided into three geographical regions. Region A consists of Attica. Region B includes Thessaly, Macedonia, Epirus, Thrace and Thessaloniki. Region C includes Sterea, Ellada, Evia, the Ionian Islands, the Peloponnese, Crete and the Aegean Islands. For Region A the competent body for taking fuel samples is the Fuel Distribution & Storage Inspectorate (KEDAK) of the Ministry of the Environment, Energy & Climate Change. For Region B and C the competent bodies that take samples are mixed inspection teams from; the competent Chemical Services of the General Chemical State Laboratory, working in collaboration with the relevant regional directorates of the Fraud Squad (SDOE).

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

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

The number of samples to be tested in each period (summer and winter) for each fuel grade (if annual sales account for at least 10% of the fuel market) are calculated using the following formula:

N(χ) = where:

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

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

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

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

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

15.2.2.2 FQMS administration

The Competent Authority for the system of monitoring fuel quality (automotive petrol and diesel) is the Petrochemicals Directorate of the General Chemical State Laboratory. The system was designed using model A of the ELOT EN 14274 standard taking into account fuel sales levels. The Greek Organization for Standardisation (ELOT) has adopted EN 14274 standard without changes. The system was implemented in Greece with the State Supreme Chemical Council Decision No. 316/2010, (Government Gazette 501/B/2012). Fuel sampling is carried out by public authorities. Where non-compliant samples have been discovered the sampling authority is responsible for taking action. Failure to comply with the provisions of the legislation result in the sanctions specified in article 10 of the State Supreme Chemical Council Decision No. 316/2010, (Government Gazette 501/B/2012). In Greece there are 4 refineries and approximately 7000 refuelling stations.

15.2.2.3 National Legislation that transposed the FQD

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

15.2.2.4 Reporting periods

The System is implemented twice a year, once for the summer period from 1 May to 30 September and once for the winter period from 1 October to 30 April. No Arctic derogation has been granted.

15.2.3 Compliance with Fuel Quality Limit Values

Table 15-3: Petrol Fuel Grades

Petrol - Details of samples that exceed tolerance limits:
No samples were found to be out of compliance with Directive specifications.

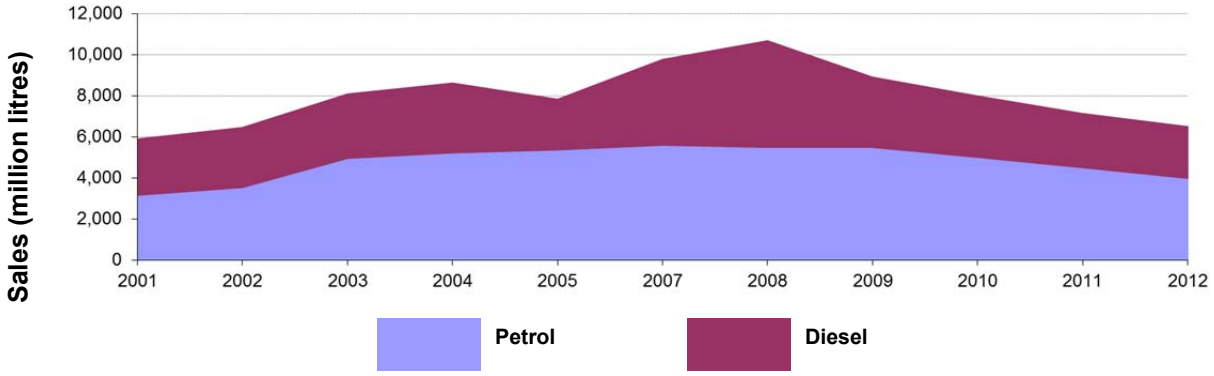
Table 15-4: Diesel Fuel Grades

Diesel - Details of samples that exceed tolerance limits:
No samples were found to be out of compliance with Directive specifications.

15.3 Temporal Trends

Figure 15-2 shows the trend in total fuel sales since 2001; fuels sales have fluctuated with petrol fuel sales increasing to 2007 then gradually falling and diesel sales fluctuating but remaining at similar levels of sales across the period. From 2001 to 2012 petrol sales have risen 828 million litres (20.8%), whilst diesel sales have fallen by 227 million litres (9.1%). In the period 2011 to 2012 petrol and diesel sales have fallen by 517 million litres (11.5%) and 122 million litres (4.6%) respectively.

Figure 15-2: Temporal trends in national sales of petrol and diesel (million litres)



15.4 Statistical Analysis

The following charts in this section are known as box-plots and they display the distribution of fuel characteristics per Member State by illustrating the:

- Sample minimum
- Lower 25% range
- Middle 50% range
- Median
- Upper 25% range
- Maximum

For a full explanation of the information presented in a Box Plot diagram, please see section 4.

Fuel sampling in Greece in 2012 recorded no test results out of specification with limit values. The analysis charts for petrol (Figure 15-3) and diesel (Figure 15-4) detail the distribution of sample results for the 5 selected parameters;

Petrol:

- Research Octane Number
- Motor Octane Number
- Summer Vapour Pressure

Diesel:

- Density at 15^{o}C
- Distillation – 95% v/v recovered

Sample results for these parameters have been depicted using box plots based on the reported sample minimum, lower quartile (Q1), median (Q2), upper quartile (Q3), and the maximum sample value.

15.4.1 Petrol Analysis

Sample results in 2012 have been presented in the following figures with limit values for the parameter (maximum or minimum) to demonstrate the skew of sample results. RON and MON sample results show that the fuels come close to tolerance limits but do not exceed them (with exception of RON 95 whereby insufficient data was available to conduct the MON analysis).

Summer vapour pressure analysis shows a wide distribution of samples, which are below the limit values. Only RON 98 comes close to limit values.

Figure 15-3: Petrol analysis

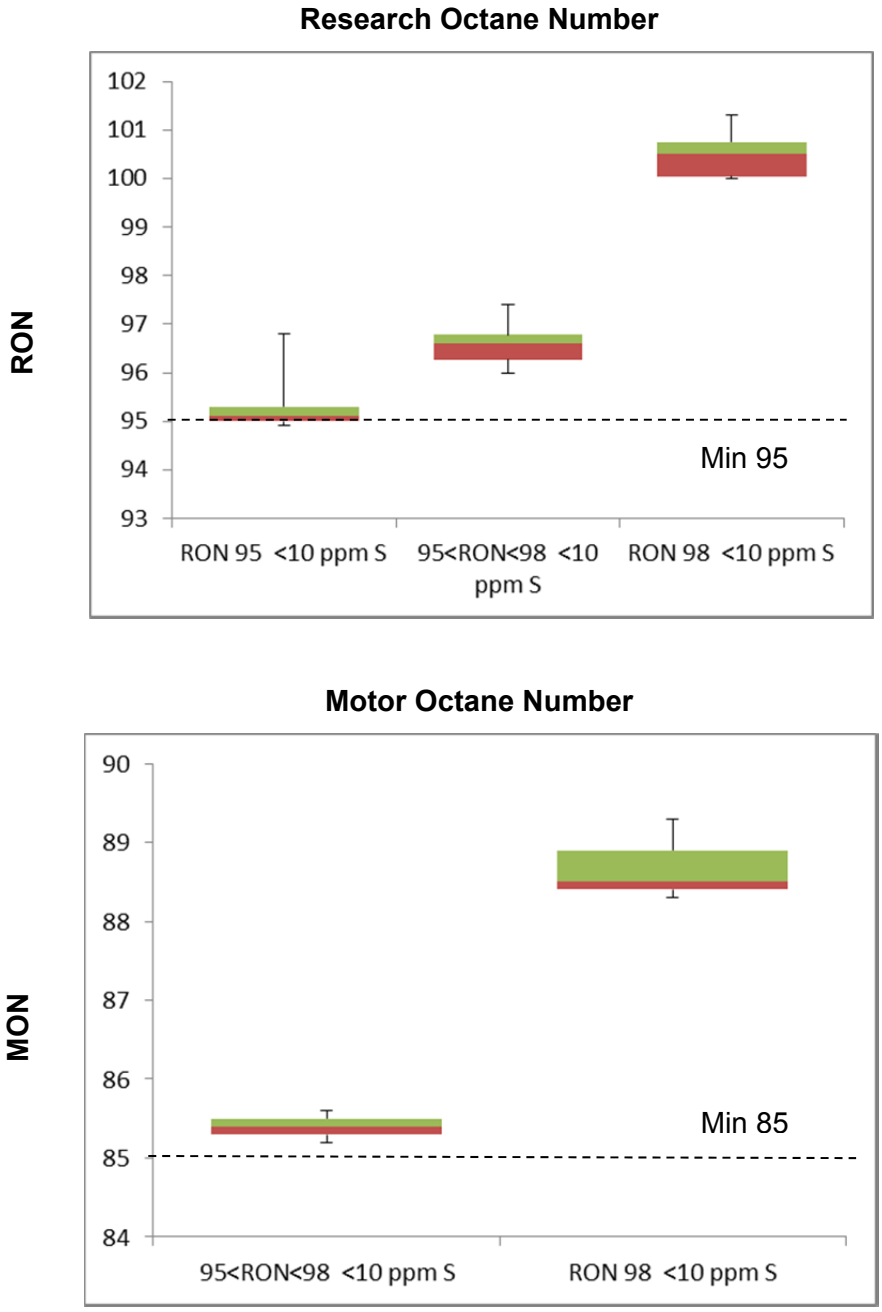
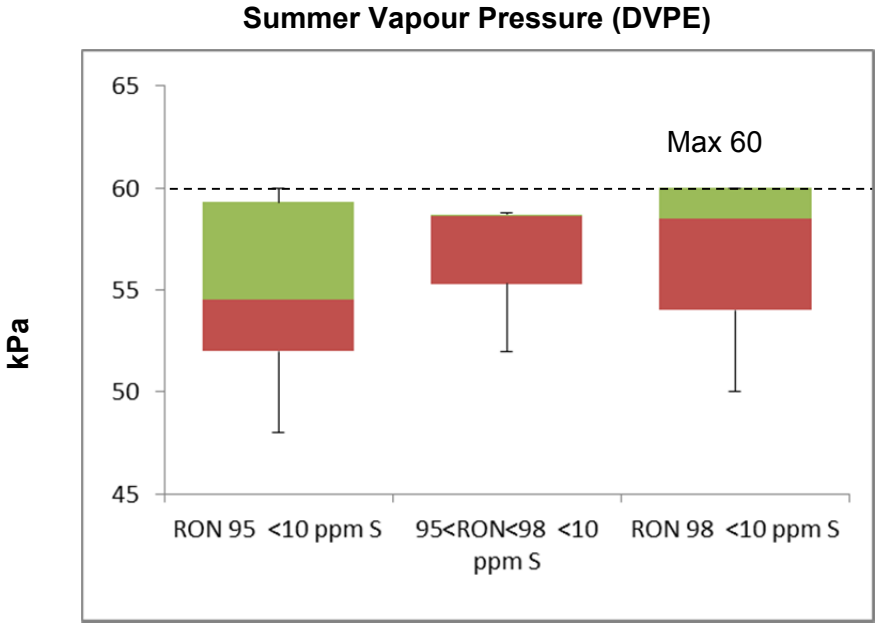


Figure 15-3: Petrol analysis (continued)



15.4.2 Diesel Analysis

The distribution of samples for Density and Distillation is fairly wide, and generally far from specification. There are some outliers in the Distillation analysis which exceed limit values, though these stay within tolerance limits, therefore the number of these samples are not documented. The majority of samples remain comfortably within specification.

Figure 15-4: Diesel analysis

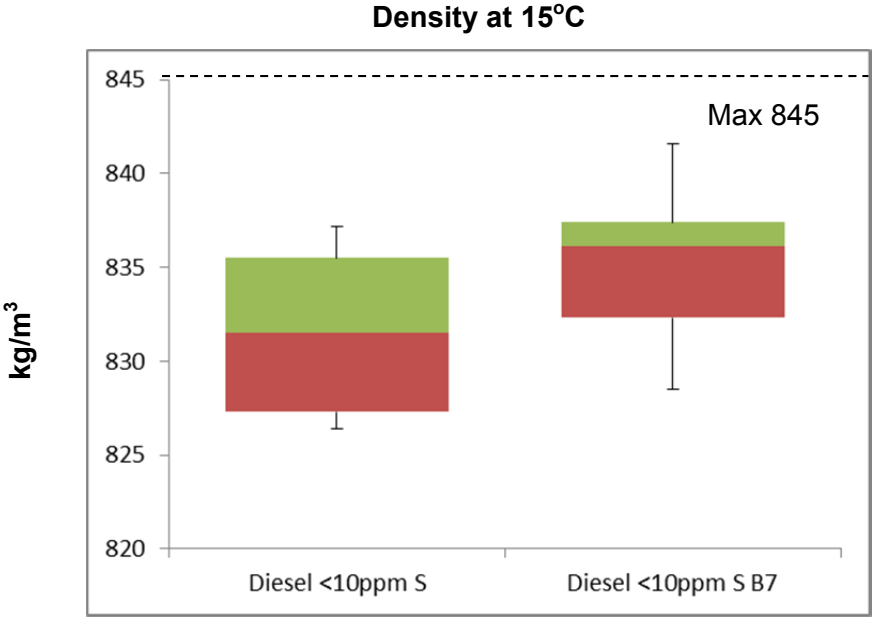
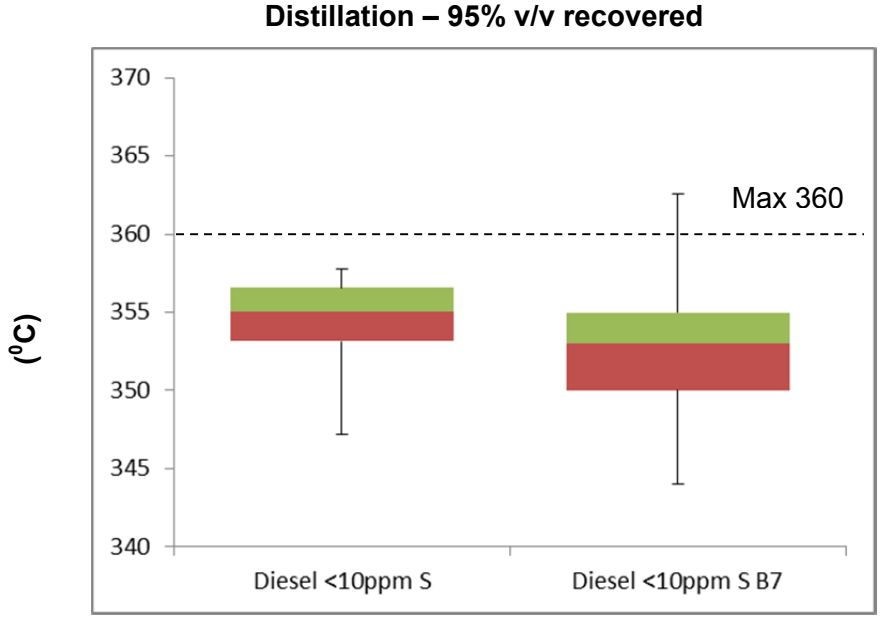


Figure 15-4: Diesel analysis (continued)



15.5 Key Areas for Improvement

The following table summarises the main areas in which improvements could be made to the monitoring system, reporting or compliance with Directive limit values. The table includes key recommendations from the previous year to give an assessment of what action has been taken by the Member State to address any issues that may have been highlighted.

Key Areas for Improvement (3 years)		
	Monitoring	**Reporting**
2012	• Greece has not complied with the minimum sampling requirements for petrol or diesel fuel grades. Only samples taken at service station locations can be used to fulfil the minimum sampling requirement. • Oxygenated substances in petrol such as Methanol, Iso-propyl alcohol, Tert-butyl alcohol, Iso-butyl alcohol are not detected by the mid-IR method used. • The number of samples over limit values have not been documented, which would improve future FQMS submissions.	The 2012 report was received on the 28th June, before the 30th June deadline
2011	• Greece has not complied with the minimum sampling requirements for petrol or diesel fuel grades. Only samples taken at service station locations can be used to fulfil the minimum sampling requirement. • Greece did not report parameter	The 2011 report was submitted within Member State deadline.

Key Areas for Improvement (3 years)		
	Monitoring	**Reporting**
	results for Manganese for all petrol fuel grades in 2011.	
2010	• Regional split of sales not provided as the responsible for reporting sales department has given the regional sales report after the deadline. • Not enough sampling has been taken at fuel stations.	Report submitted on the 26th of July - after the deadline of 30th June.

16 Hungary

16.1 Fuel Availability 2012

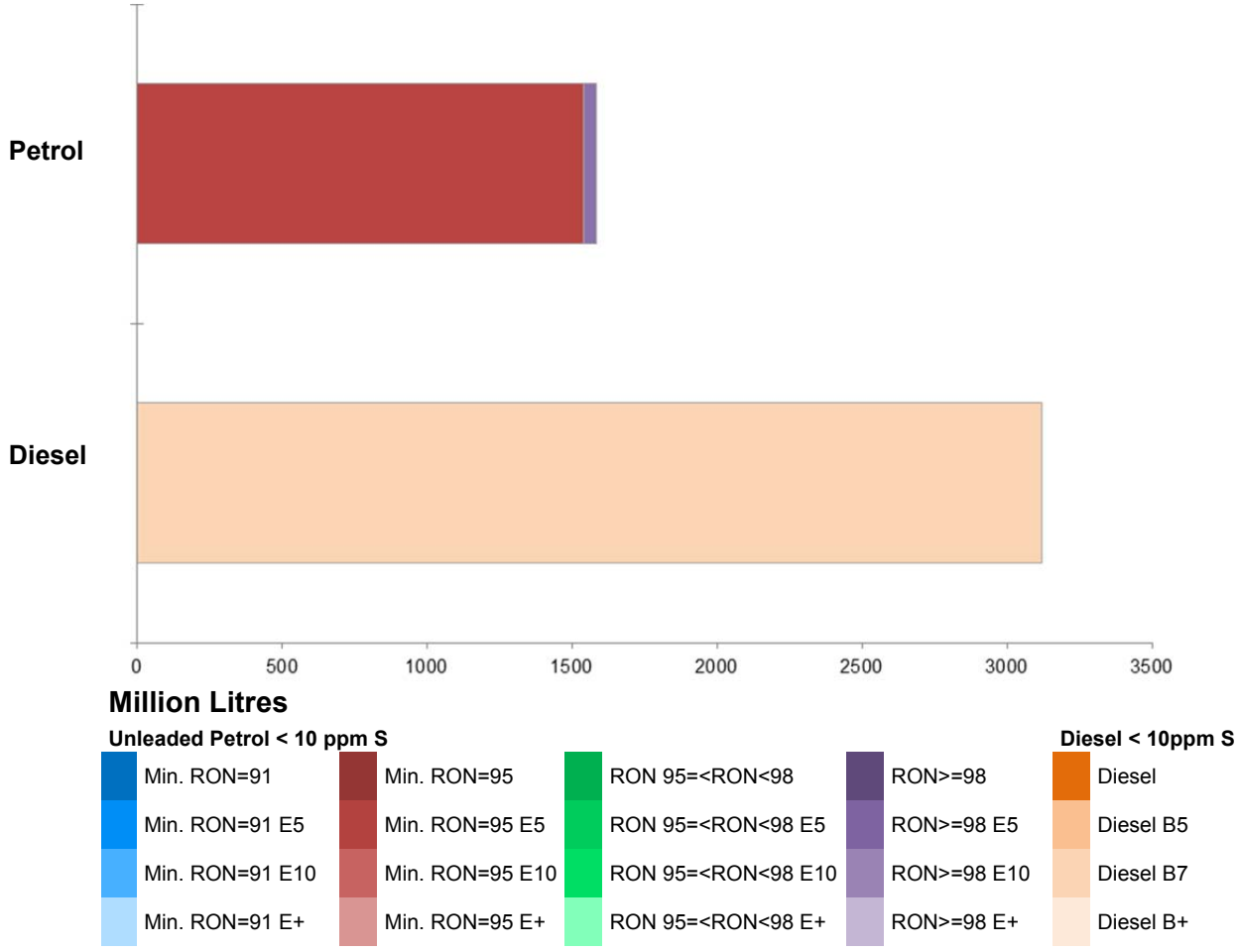
The following table lists the fuels that were reported to be available nationally in 2012.

Table 16-1: National fuel grade

Fuel grade	National fuel grade
Unleaded petrol (minimum RON = 95) E5	ESZ-95
Unleaded petrol (minimum RON >= 98) E5	ESZ-98
Diesel fuel B7	Diesel

16.1.1 Sales, sampling and reporting

Figure 16-1: Fuel Sales proportions by fuel type



During 2012 diesel fuel sales in Hungary were nearly twice as big as that of petrol fuel sales with sales of 3,121 million litres. All diesel fuel sold in Hungary was reported to contain up to a maximum of 7% biofuels. Petrol fuel grades RON 95 (with maximum 5% biofuel) and RON 98 (with up to 5% biofuel content) comprised 1,584 million litres in 2012, with proportions on fuel grades split according to 97.3% sales of RON 95 and 2.7% RON 98 petrol.

Table 16-2: Fuel sales and sampling

Fuel type (Parent Grade)	Sales (Million litres)	Sales % total of fuel type	Samples (1) S	Samples (1) W	Samples (1) TR (2)	Separate S/W(3)	Para-meters measured (4)	Add. Notes
Unleaded petrol min. RON=95 (<10 ppm S) E5	1,541	97.33%	50	50	50	Yes	19 of 19	
Unleaded petrol RON>=98 (<10 ppm S) E5	42	2.67%	10	10	2	Yes	19 of 19	
Total Petrol	**1,583**	**100.00%**	**60**	**60**	**52**	**Yes**	**19 of 19**	
Diesel (<10 ppm sulphur) B7	3,121	100.00%	60	60	50	Yes	6 of 6	
Total Diesel	**3,121**	**100.00%**	**60**	**60**	**50**	**Yes**	**6 of 6**	

(1)	Samples	The actual number of samples taken by the Member State in the summer (s) and winter (w) periods
(2)	TR	Total requirement per summer and winter period according to EN 14274. Brackets () show where a national model is being used, and the requirement is indicative to demonstrate equivalence with EN14274.
(3)	Separate S & W?	Yes indicates separate summer & winter reporting, and No indicates full year sample results reporting only.
(4)	Parameters measured	Currently 19 petrol parameters should be tested and reported by the Member States and 6 diesel parameters.

16.1.1.1 Petrol Samples

Hungary has complied with minimum sampling requirements for petrol fuel grade RON 95 E5 with all samples taken from service stations (fuel dispensing sites). Samples for fuel grade RON 98 have also complied with minimum requirements as fuel sales are less than 10% of the total petrol market, meaning the sampling requirement is reduced.

16.1.1.2 Diesel Samples

Diesel fuel samples tested in 2012 complied with the total minimum requirement of samples to be collected from service stations.

16.2 Fuel Quality Monitoring 2012

16.2.1 Description of System

Responsible organisation(s)	ÁMEI Petroleum Products Quality Inspection Company Limited By Shares
Fuel Quality Monitoring System (FQMS)	EN 14274 Statistical model C
Country Size	Small
Summer Period	Normal
Location(s) of sampling	Service stations

Time/frequency of sampling	Samples have been taken 9 months in the year 2012 for petrol and 9 months of the year for diesel.
Specification of test methods	The quality of petrol sold in Hungary is equivalent to the standard (EN 228), ethanol concentration is max. 5%, some petrol (mainly with octane number >=98) contains bioETBE (concentration is max. 15%) and the petrol fulfils the oxygen content requirement (max. 2.7%).
Collection of sales data	Sales volumes have been collected from the National Tax and Customs Administration (NAV) in 2012.
Other details	

16.2.2 Fuel Quality Monitoring System

16.2.2.1 Sampling

The organisation responsible for sampling, analysis and reporting is AMEI Petroleum Products Quality Inspection Company, which is in contract with the Ministry of National Development. Samples were taken from refuelling stations. Refuelling stations to be sampled randomly selected from the list of refuelling stations (1850 refuelling stations were in Hungary). The list was made by National Tax and Customs Administration (NAV).

Our system is equivalent of system proposed by CEN. On evaluating the system we determine all parameters requested by Directive.

All parameters requested in the Directive were measured (including manganese content).

There were 5 exceeding samples found (total sample number is 240), 3 of them are vapour pressure, 2 of them are aromatics content but the deviations are not high.

16.2.2.2 FQMS administration

In Hungary the Ministry of National Development is responsible for managing and implementing the FQM Directive. Fuel sampling has been managed and carried out by AMEI Petroleum Products Quality Inspection Company.

AMEI Petroleum Products Quality Inspection company provide annual data for the Ministry by 31st March.

The public body responsible for taking action where non-complaint samples are discovered is AMEI who have to inform the Ministry; the National Custom and Tax Administration and Hungarian Authority for Consumer Protection.

There is 1 refinery and 14 distribution terminals in Hungary. Because the "private" import is remarkable we were sampling the filling stations only.

16.2.2.3 National Legislation that transposed the FQD

There is a decree on the quality requirements of fuels in Hungary (30/2011. NFM) valid from 28. 06. 2011. This decree is based on the Directive.

16.2.2.4 Reporting periods

Summer – 1st May – 30th September

Winter – 15th November – 28th February

In Hungary the transition periods are: from 1st March to 30th April, and from 1st October to 14th November. During these periods no samples are taken.

16.2.3 Compliance with Fuel Quality Limit Values

Table 16-3: Petrol Fuel Grades

Unleaded petrol (minimum RON = 95) E5 - Details of samples that exceed tolerance limits:					
Parameter	**Limit Value**	**Tolerance Limit* (TL)**	**Max/Min value of samples tested**	**No samples outside TL**	**% samples outside TL**
Summer vapour pressure, kPa	60	61.8	63.3	3	6%
Aromatics, % V/V	35	36	37.2	2	2%
Member State notes No notes are provided as part of the submission to detail action for samples found to exceed tolerance limits					
Unleaded petrol (minimum RON >= 98) E5 - Details of samples that exceed tolerance limits:					
No samples found to be outside tolerance limits					

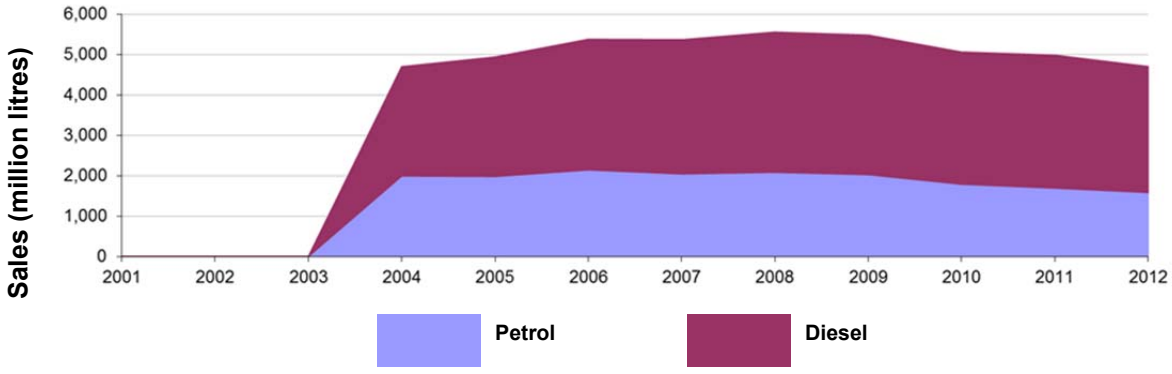
Table 16-4: Diesel Fuel Grades

Diesel - Details of samples that exceed tolerance limits:
No samples found to be outside tolerance limits

16.3 Temporal Trends

Figure 16-2 shows the trend in total fuel sales since 2004. Diesel sales in Hungary have decreased by 5% compared to 2011 sales figures. Petrol fuel sales have continued to decline and reduced by 6.4% in the period between 2011 and 2012. Overall and compared to sales figures reported in 2004, diesel fuel sales have risen by 13.2% (from 2,710 million litres in 2004 to 3,121 million litres in 2012). Petrol fuel sales figures have, in contrast, decreased by 25.8% in the same period, falling from 1,992 million litres in 2004 to 1,584 million litres in 2012.

Figure 16-2: Temporal trends in national sales of petrol and diesel (million litres)



16.4 Statistical Analysis

The following charts in this section are known as box-plots and they display the distribution of fuel characteristics per Member State by illustrating the:

- Sample minimum
- Lower 25% range
- Middle 50% range
- Median

- Upper 25% range
- Maximum

For a full explanation of the information presented in a Box Plot diagram, please see Section 4 of the wider report.

Fuel sampling in Hungary in 2012 recorded relatively few test results out of specification with limits. The analysis charts for petrol (Figure 16-3) and diesel (Figure 16-4) detail the distribution of sample results for the 5 selected parameters;

Petrol:

- Research Octane Number
- Motor Octane Number
- Summer Vapour Pressure

Diesel:

- Density at 15°C
- Distillation – 95% v/v recovered

Sample results for these parameters have been depicted using box plots based on the reported sample minimum, lower quartile (Q1), median (Q2), upper quartile (Q3), and the maximum sample value.

16.4.1 Petrol Analysis

Sample results in 2012 have been presented in the following figures with limit values for the parameter (maximum or minimum) to demonstrate the skew of sample results. No samples for either fuel exceeded the tolerance limits for RON according to Directive specifications. Summer Vapour pressure results demonstrate that samples are tight to specification – with three outliers for fuel grade ESZ-95 exceeding limit values.

Figure 16-3: Petrol analysis

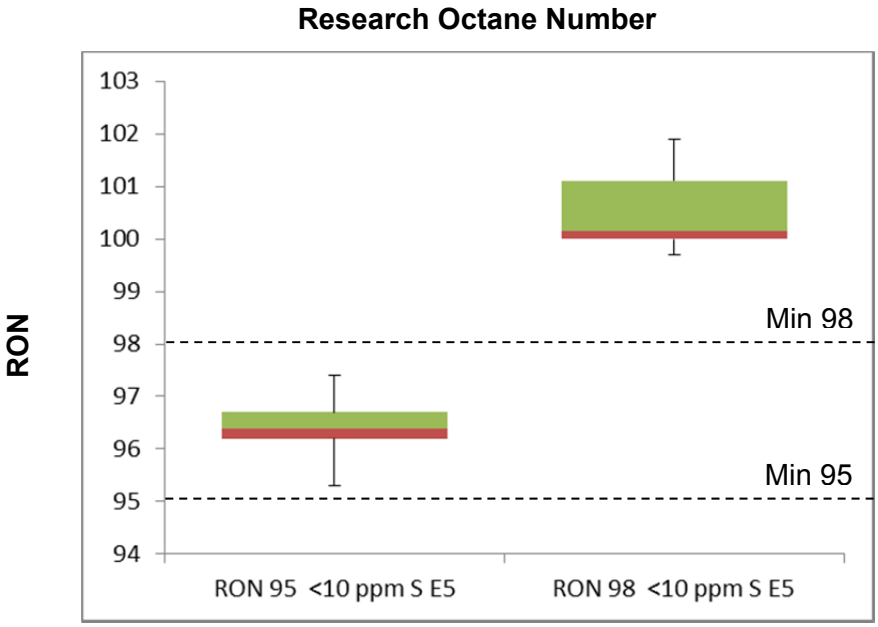
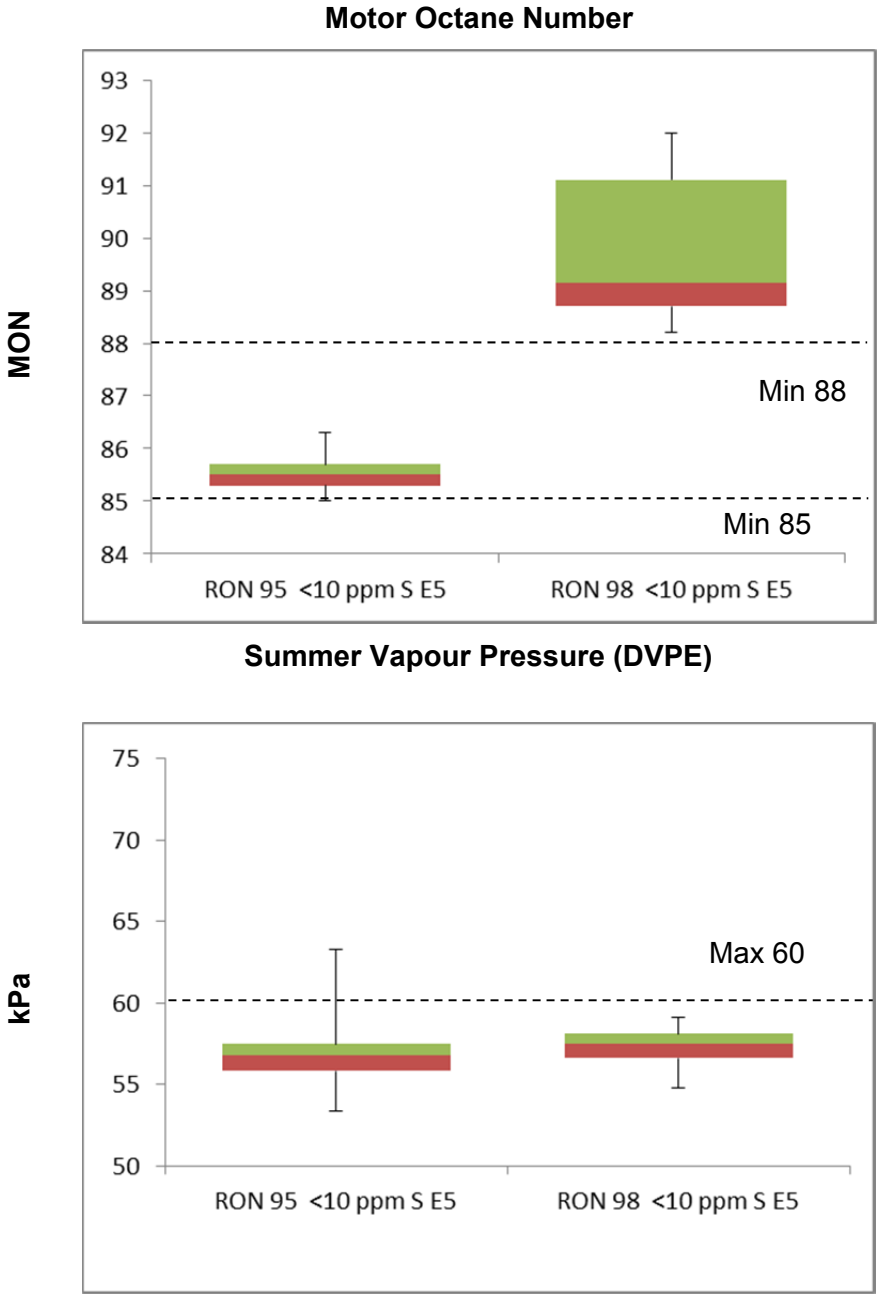


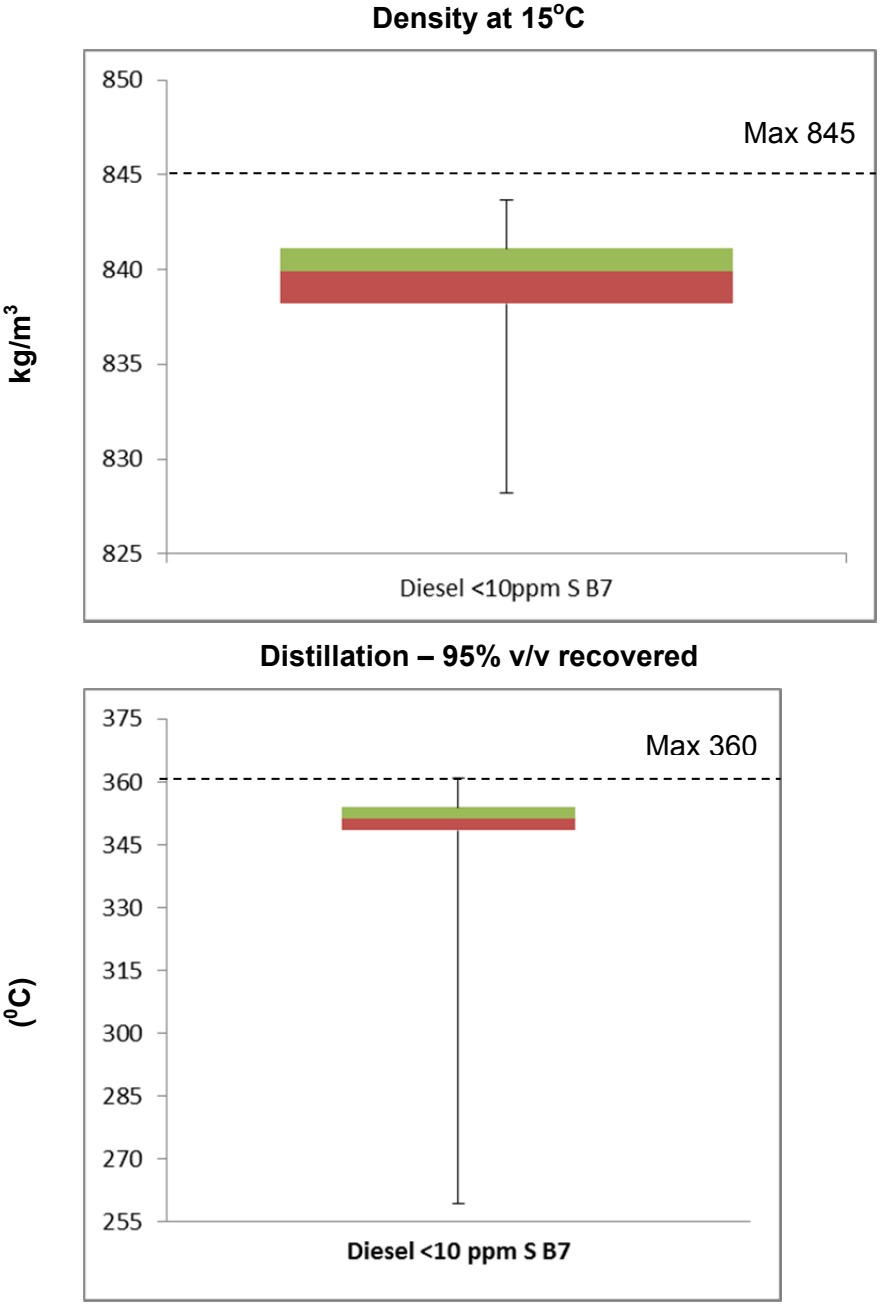
Figure 16-3: Petrol analysis (continued)



16.4.2 Diesel Analysis

Diesel sample results for Density at 15°C show little variation in samples - all samples in 2012 remained within limit values. Results for Distillation also demonstrated narrow banding of the bulk of samples.

Figure 16-4: Diesel analysis



16.5 Key Areas for Improvement

The following table summarises the main areas in which improvements could be made to the monitoring system, reporting or compliance with Directive limit values. The table includes key recommendations from the previous year to give an assessment of what action has been taken by the Member State to address any issues that may have been highlighted.

Key Areas for Improvement (3 years)		
	Monitoring	**Reporting**
2012	• No comments	• The report was received within the submission deadline and in the 2012 reporting template.

Key Areas for Improvement (3 years)		
	Monitoring	**Reporting**
2011	• Hungary did not report parameter results for Manganese for all petrol fuel grades in 2011 as alternative monitoring suggests there are no metallic additives in petrol fuels sold in Hungary. • Sample quantities meet the requirements of EN 14274 statistical model C for a small country.	• The report was received within the submission deadline and in the 2011 reporting template.
2010	• No regional spilt of sales provided.	• No comments

17 Ireland

17.1 Fuel Availability 2012

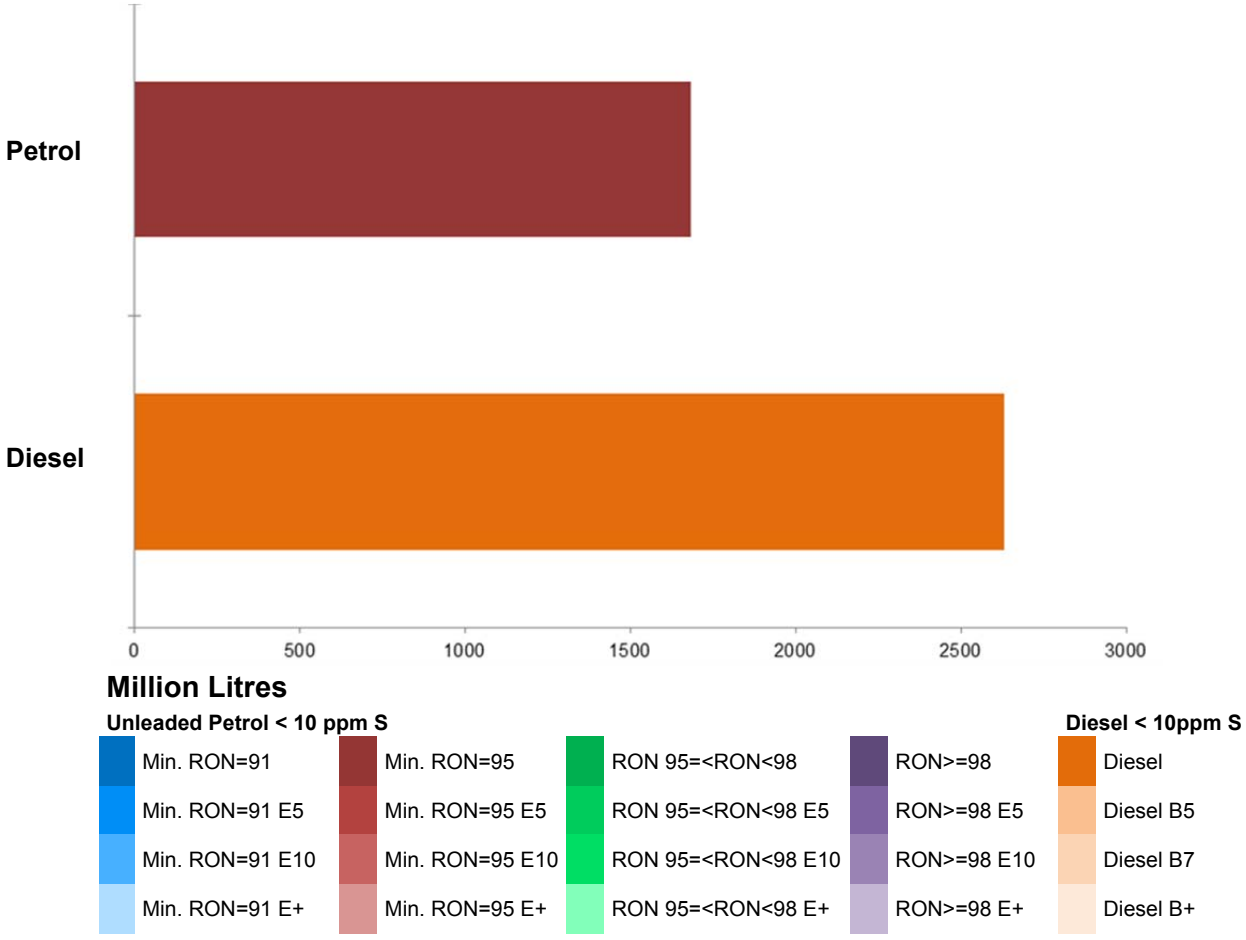
The following table lists the fuels that were reported to be available nationally in 2012.

Table 17-1: National fuel grade

Fuel grade	National fuel grade
Unleaded petrol (minimum RON = 95)	RON 95
Diesel fuel	Diesel

17.1.1 Sales, sampling and reporting

Figure 17-1: Fuel Sales proportions by fuel type



During 2012 all fuel sales recorded for Ireland were comprised of fuels with no biofuel content. As in previous years, diesel sales exceeded sales of petrol fuel grades. Over 2,600 million litres of diesel was sold in comparison to under 1,700 million litres of petrol fuel sales (petrol grade RON 95).

Table 17-2: Fuel sales and sampling

Fuel type (Parent Grade)	Sales (Million litres)	Sales % total of fuel type	Samples (1) S	Samples (1) W	Samples (1) TR (2)	Separate S/W(3)	Parameters measured (4)	Add. Notes
Unleaded petrol min. RON=95 (<10 ppm S)	1,684	100.00%	91	110	50	Yes	19 of 19	
Total Petrol	**1,684**	**100.00%**	**91**	**110**	**50**	**Yes**	**19 of 19**	
Diesel (<10 ppm sulphur)	2,630	100.00%	91	103	50	Yes	6 of 6	
Total Diesel	**2,630**	**100.00%**	**91**	**103**	**50**	**Yes**	**6 of 6**	

(1)	Samples	The actual number of samples taken by the Member State in the summer (s) and winter (w) periods
(2)	TR	Total requirement per summer and winter period according to EN 14274. Brackets () show where a national model is being used, and the requirement is indicative to demonstrate equivalence with EN14274.
(3)	Separate S & W?	Yes indicates separate summer & winter reporting, and No indicates full year sample results reporting only.
(4)	Parameters measured	Currently 19 petrol parameters should be tested and reported by the Member States and 6 diesel parameters.

17.1.1.1 Petrol Samples

Ireland complied with minimum sampling requirements for petrol in 2012, using EN 14274 statistical model C as a small country.

17.1.1.2 Diesel Samples

Ireland complied with minimum sampling requirements for diesel in 2012.

17.2 Fuel Quality Monitoring 2012

17.2.1 Description of System

Responsible organisation(s)	Department of the Environment, Community and Local Government
Fuel Quality Monitoring System (FQMS)	EN 14274 Statistical model C
Country Size	Small
Summer Period	Arctic
Location(s) of sampling	Service stations, terminals and refineries.
Time/frequency of sampling	Samples have been taken in every month throughout 2012 for petrol, whereas diesel had two months (Feb and Nov) whereby no samples were taken.

Specification of test methods	For Petrol samples, test methods used were as specified in either EN228:2004 or EN228:2008 with the following exceptions: • 101 RON samples of the 201 samples taken were analysed by an FTNIR method, • 101 MON samples of the 201 samples taken were also analysed by an FTNIR method. 6 • 8 of the 169 sulphur samples were analysed by EN 14596. • 101 of 151 Lead samples were analysed by an XRF method. • All Manganese samples were analysed by an XRF method. For diesel samples, test methods used were as specified in either EN590:2004 or EN590:2009 with the following exception: sulphur 100 of the 194 samples were analysed by EN 14596.
Collection of sales data	Sales figures for petrol and diesel are supplied by the Department of Communications, Energy and Natural Resources The Oil returns that come to the Department from Oil Companies & Consumers are rated as unleaded 95.

Other details

Under Commission Decision of 15.6.2011 on the request from Ireland for a derogation pursuant to Article 3(4) and (5) of Directive 98/70/EC, as amended by Directive 2009/30/EC, Ireland is permitted to place on the market (during the summer period) petrol with a maximum vapour pressure of 70kPa (derogation) until the end of 2020.

In 2012 the Department contracted an independent company to undertake sampling of fuel at forecourts around the country. Ireland has moved away from relying partly on Revenue samples which are collected at terminals and have moved towards increased independent sampling from forecourts.

17.2.2 Fuel Quality Monitoring System

17.2.2.1 Sampling

Samples of petrol and diesel are taken by the Office of the Revenue Commissioners, SGS Ireland Ltd and Inspection Services Ltd. Samples are analysed by the State Laboratory and SGS Ireland Limited. Reporting is the responsibility of the Department of the Environment, Community, and Local Government. Samples are taken from refineries, terminals and refuelling stations. Selection of sampling points is on a random basis and is carried out throughout the year. For Petrol samples, test methods used were as specified in either EN228:2004 or EN228:2008 with the following exceptions: 101 RON samples of the 201 samples taken were analysed by an FTNIR method, 101 MON samples of the 201 samples taken were also analysed by an FTNIR method. 68 of the 169 sulphur samples were analysed to the EN 14596 standard. 101 of 151 Lead samples were analysed by an XRF method. All Manganese samples were analysed by an XRF method. For diesel samples, test methods used were as specified in either EN590:2004 or EN590:2009 with the following exception: sulphur 100 of the 194 samples were analysed by EN 14596.

17.2.2.2 FQMS administration

Department of Environment, Community and Local Government have responsibility for managing and implementing the FQM Directive. Fuel sampling is carried out by both the Office of the Revenue Commissioners, a public body, and by Inspection Services Ltd and SGS Ireland both contracted privately. Annual data is provided by SGS Ireland Ltd for the winter period in January of each year and for the summer period in September of each year. Annual data is provided by Inspection Services Ltd and the Office of the Revenue Commissioners once they have been analysed by the State Laboratory. When non-compliant samples have been discovered it is the responsibility of the Department of Environment, Community and Local Government to report, manage and monitor the non-compliance. The Department writes to the Fuel Company involved asking them to explain the non-compliance. All non-compliances are reported on the annual Fuel Quality Data Report and follow up action also reported. Ireland uses EN 14274 statistical model C as a small country. Whitegate Oil Refinery in Co Cork is Ireland's only refinery. There are five distribution terminals in Ireland. There are no reasons why the annual Fuel Quality Monitoring data report cannot be provided by the annual deadline of 30th June.

17.2.2.3 National Legislation that transposed the FQD

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

17.2.2.4 Reporting periods

Summer period is June, July and August. Winter period is from September to May. An Arctic derogation has been granted.

17.2.3 Compliance with Fuel Quality Limit Values

Table 17-3: Petrol Fuel Grades

RON 95 Petrol - Details of samples that exceed tolerance limits:					
Parameter	**Limit Value**	**Tolerance Limit* (TL)**	**Max/Min value of samples tested**	**No samples outside TL**	**% samples outside TL**
Research Octane Number (RON)	95	94.6	93.3	6	2.98%
Olefins, % v/v	18	21.8	19.7	1	0.50%
Aromatics, % v/v	35	36	37.5	1	0.50%
Sulphur content mg/kg	10	11.8	12.9	2	1.18%
Member State notes For Olefins and Aromatics samples out of tolerance limits- The Department wrote to the company concerned. To date no reply has been received and follow up letters have issued. For Sulphur Content Breaches of tolerance levels- The Department wrote to the companies involved. One company is yet to respond while the other company supplied copies of certificates of quality which show that the Sulphur levels were within the tolerance limits.					

Table 17-4: Diesel Fuel Grades

Diesel - Details of samples that exceed tolerance limits:					
Parameter	**Limit Value**	**Tolerance Limit* (TL)**	**Max/Min value of samples tested**	**No samples outside TL**	**% samples outside TL**
Sulphur Content mg/kg	10	11.8	16	3	1.55%

Diesel - Details of samples that exceed tolerance limits:					
Parameter	**Limit Value**	**Tolerance Limit* (TL)**	**Max/Min value of samples tested**	**No samples outside TL**	**% samples outside TL**
FAME Content	7	7.3	8.4	1	0.57%

Member State notes

For Sulphur Content Breaches of tolerance levels: The Department wrote to the companies concerned. One of the companies supplied documentation which showed that Sulphur content for that product was 8.8mg/kg. The company concerned the discrepancy in the results is caused by different test methods being used. The Department is awaiting reply from other company concerned.

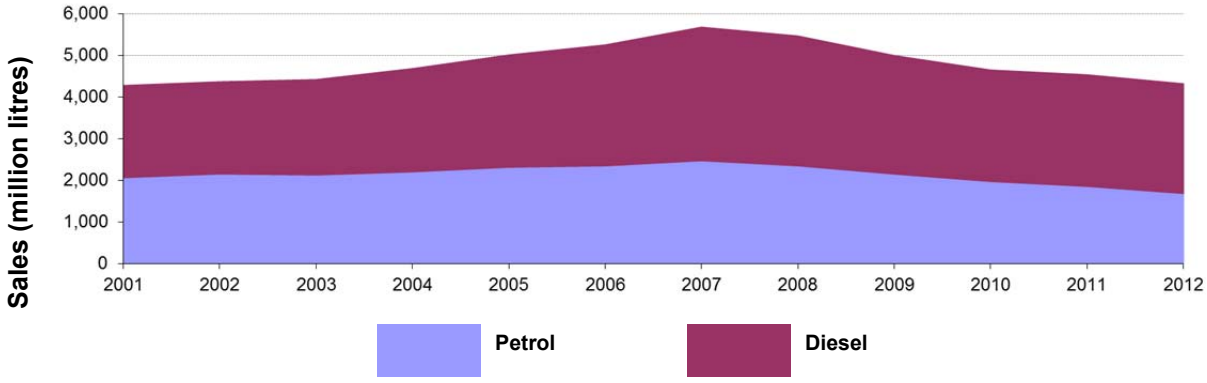
For FAME Content Breaches of tolerance levels: The Department wrote to the company concerned on 13/3/2013 asking them to explain the exceedance. No reply has been received to date. The Department has written to company again asking them to explain the exceedance.

17.3 Temporal Trends

Figure 17-2 shows the trend in total fuel sales since 2001. There has been a reduction in the quantity of fuel sold between 2011 and 2012, with 1,684 million litres of petrol sold in 2011 compared to 1,856 million litres in 2011 (representing a decrease of 9.3%). Diesel fuel sales remained reasonably static with a marginal decrease from 2,675 million litres in 2011 to 2,630 million litres in 2012 (decrease of 1.7%).

In the period since 2001, fuel sales in Ireland have fluctuated, with both fuel types peaking in 2007. Overall, the change in fuel sales since 2001 is a decrease in petrol fuel sales of nearly 23% and an increase in diesel fuels sales of 16.1%.

Figure 17-2: Temporal trends in national sales of petrol and diesel (million litres)



17.4 Statistical Analysis

The following charts in this section are known as box-plots and they display the distribution of fuel characteristics per Member State by illustrating the:

- Sample minimum
- Lower 25% range
- Middle 50% range
- Median
- Upper 25% range
- Maximum

For a full explanation of the information presented in a Box Plot diagram, please see Section 4 of the wider report.

Fuel sampling in Ireland in 2012 recorded relatively few test results out of specification with limits. The analysis charts for petrol (Figure 17-3) and diesel (Figure 17-4) detail the distribution of sample results for the 5 selected parameters;

Petrol:

- Research Octane Number
- Motor Octane Number
- Summer Vapour Pressure

Diesel:

- Density at 15°C
- Distillation – 95% v/v recovered

Sample results for these parameters have been depicted using box plots based on the reported sample minimum, lower quartile (Q1), median (Q2), upper quartile (Q3), and the maximum sample value.

17.4.1 Petrol Analysis

Sample results in 2012 have been presented in the following figures with limit values for the parameter (maximum or minimum) to demonstrate the skew of sample results.

Research Octane Number and Motor Octane Number results show that petrol sold in Ireland has little variation in RON – whilst remaining close to specifications.

A significant proportion (over half) of samples tested for summer vapour pressure exceeded the limit value (70 kPa) for the parameter in a country with arctic climatic conditions derogation. However all of the samples that exceeded 70 kPa remained within the tolerance limit. This demonstrates that vapour pressure in fuels sold in Ireland are very tight to the specification for the parameter.

Figure 17-3: Petrol analysis

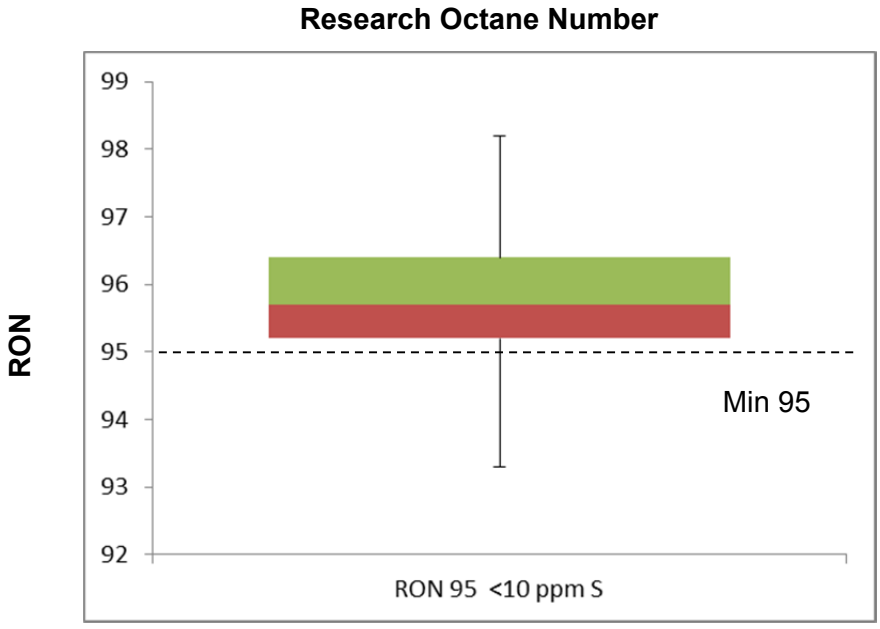
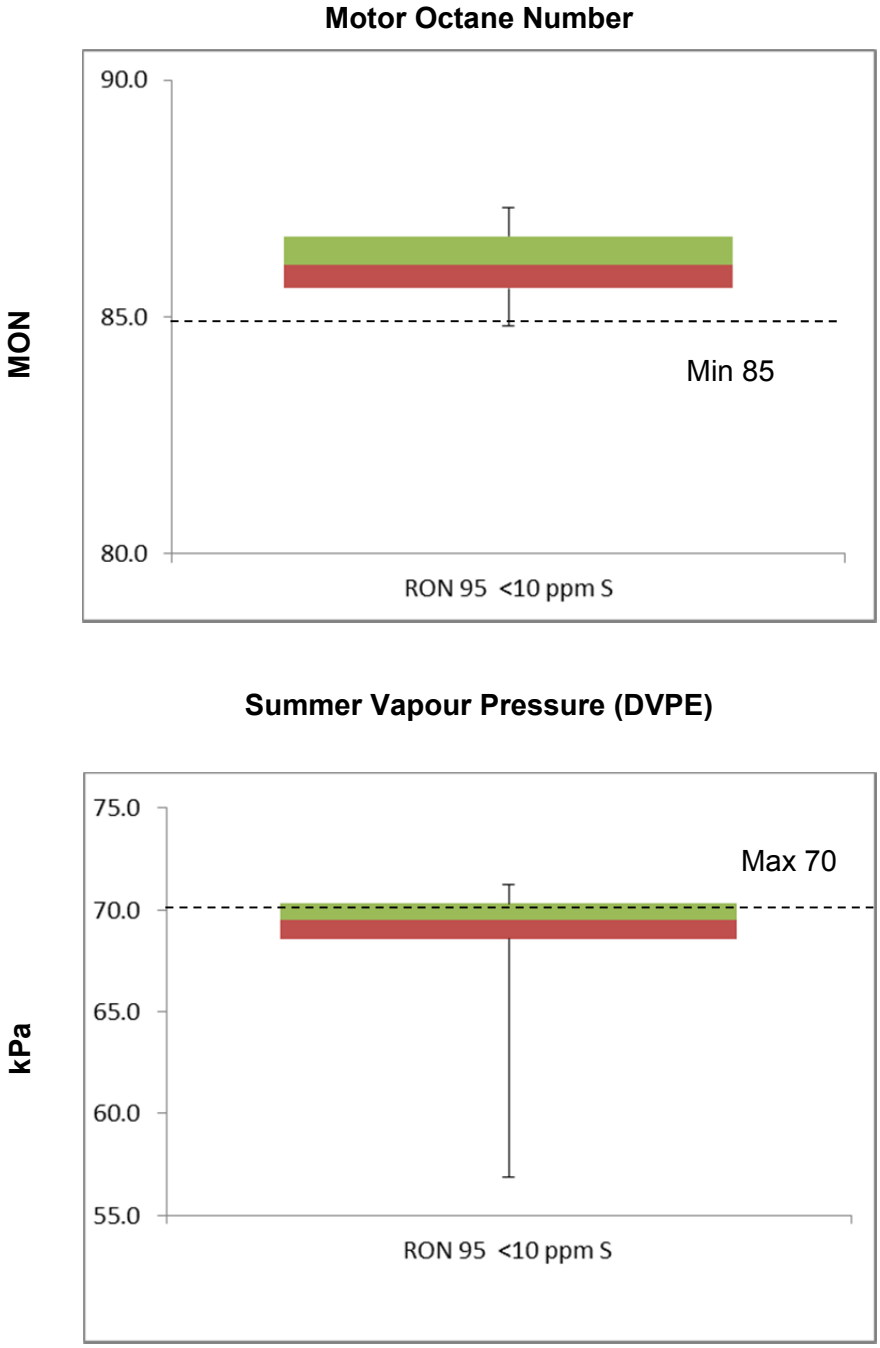


Figure 17-3: Petrol analysis (continued)



17.4.2 Diesel Analysis

Density shows a slightly wider variation in results, exhibited by the widely spread coloured bands at the 25 and 75 quartile – similar to results for the fuel type in 2010. Distillation shows that the fuel grade is skewed towards the maximum specification.

Figure 17-4: Diesel analysis

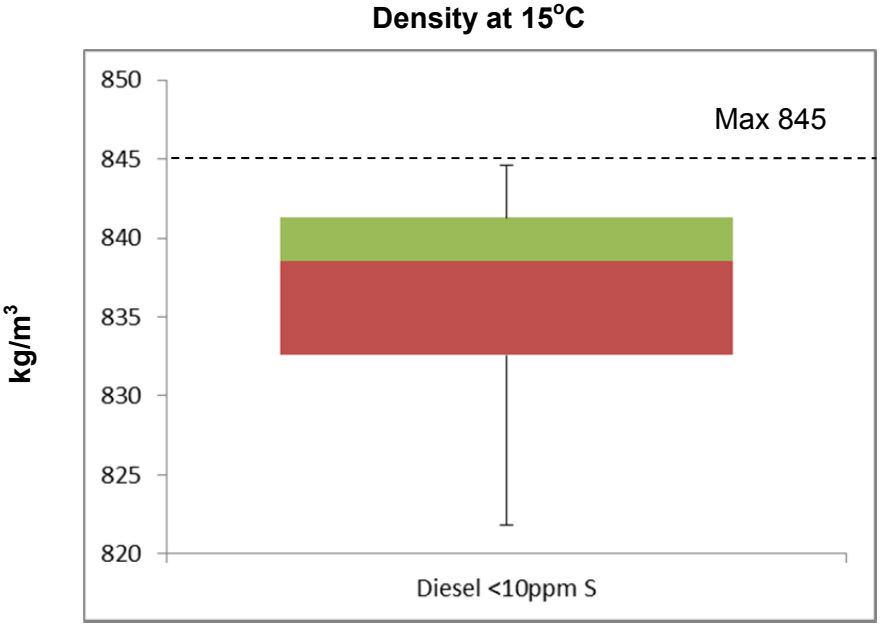
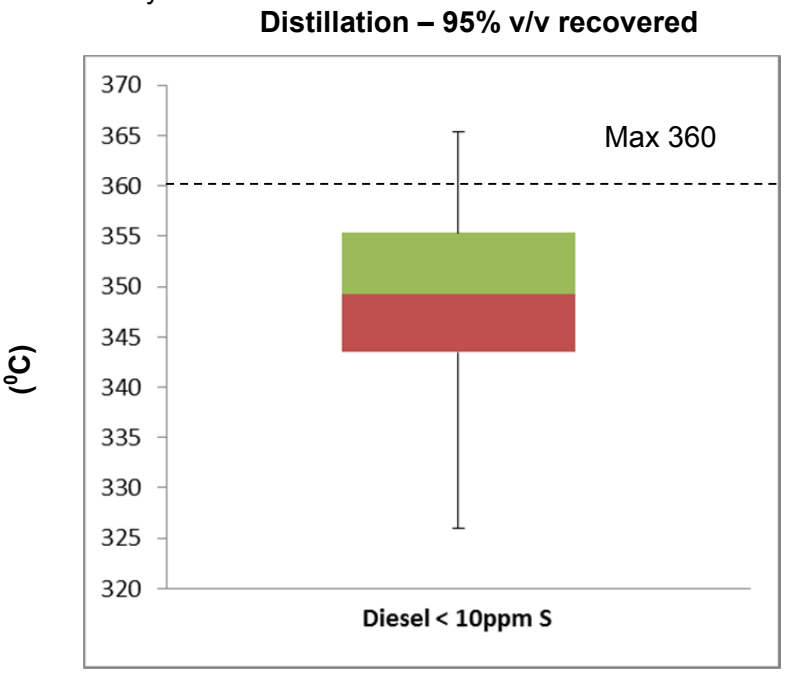


Figure 17-4: Diesel analysis



17.5 Key Areas for Improvement

The following table summarises the main areas in which improvements could be made to the monitoring system, reporting or compliance with Directive limit values. The table includes key recommendations from the previous year to give an assessment of what action has been taken by the Member State to address any issues that may have been highlighted.

Key Areas for Improvement (3 years)	
Monitoring	**Reporting**

Key Areas for Improvement (3 years)		
	Monitoring	**Reporting**
2012	• No comment	• The report from Ireland was received on time and in the requested template.
2011	• Sample quantities are almost compliant; however a minimum of 50 samples should be taken per fuel grade per period at service stations in order to fully comply with the Directive requirements for the statistical model chosen. Ireland did not achieve this level of service station sampling (although they were very close). • Ireland did not report parameter results for Oxygen content for petrol fuel grade RON 95 in 2011.	• The report from Ireland was received on time and in the requested template.
2010	• Insufficient sampling at service stations.	• No comment.

18 Italy

18.1 Fuel Availability 2012

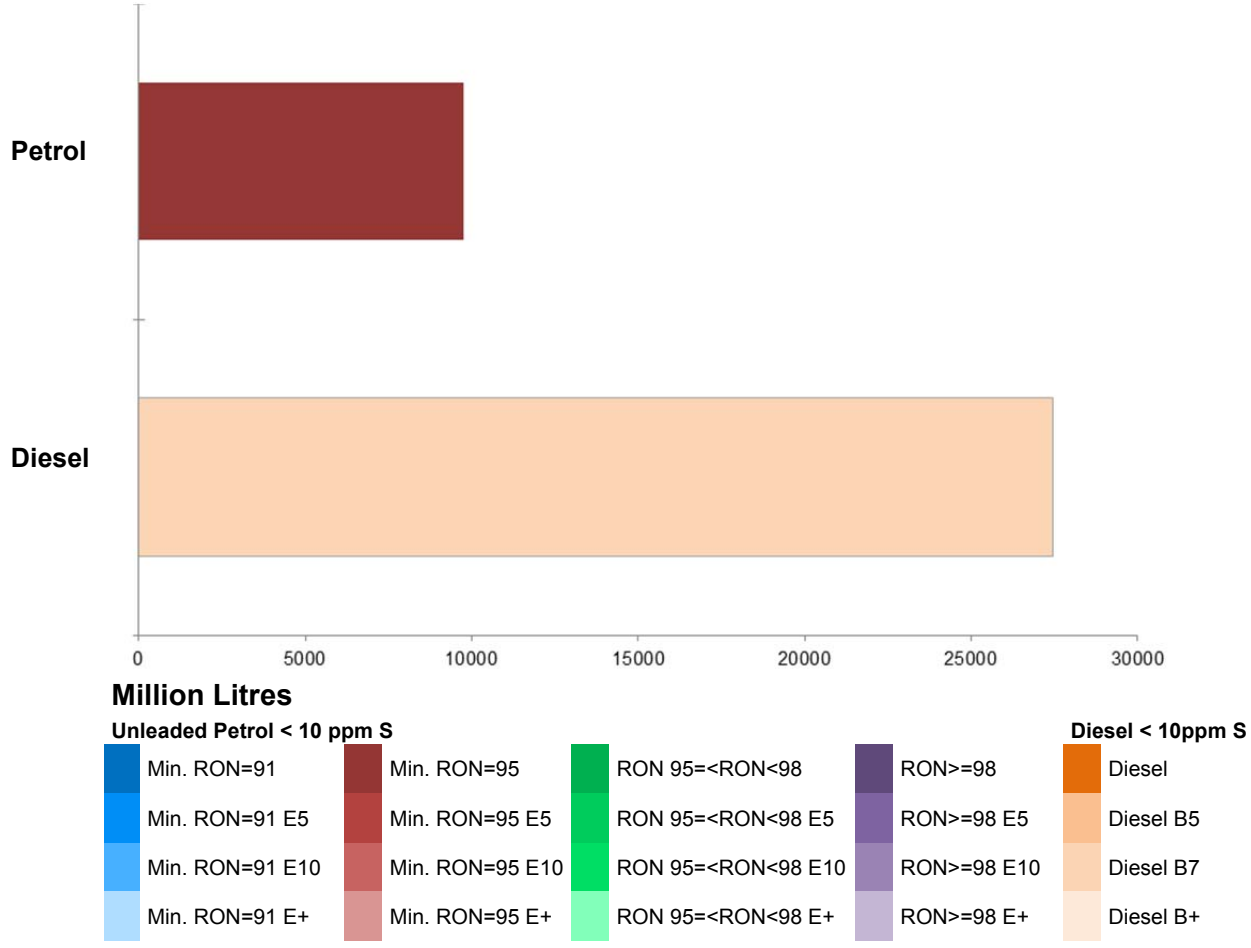
The following table lists the fuels that were reported to be available nationally in 2012.

Table 18-1: National fuel grade

Fuel grade	National fuel grade
Unleaded petrol (minimum RON = 95)	RON 95
Diesel fuel B7	Diesel

18.1.1 Sales, sampling and reporting

Figure 18-1: Fuel Sales proportions by fuel type



During 2012 diesel sales recorded far exceeded petrol sales. Over 27,445 million litres of diesel was sold in comparison to 9,750 million litres of petrol fuel sales (petrol grade RON 95).

Table 18-2: Fuel sales and sampling

Fuel type (Parent Grade)	Sales (Million litres)	Sales, % total of fuel type	Samples (1) S	Samples (1) W	Samples (1) TR (2)	Separate S/W(3)	Parameters measured (4)	Add. Notes
Unleaded petrol min. RON=95 (<10 ppm S)	9,750	100.00%	100	100	100	Yes	15 of 19	(a)
Total Petrol	**9,750**	**100.00%**	**100**	**100**	**100**	**Yes**	**15 of 19**	
Diesel	27,445	100.00%	100	100	100	Yes	6 of 6	
Total Diesel	**27,445**	**100.00%**	**100**	**100**	**100**	**Yes**	**6 of 6**	

(1)	Samples	The actual number of samples taken by the Member State in the summer (s) and winter (w) periods
(2)	TR	Total requirement per summer and winter period according to EN 14274. Brackets () show where a national model is being used, and the requirement is indicative to demonstrate equivalence with EN14274.
(3)	Separate S & W?	Yes indicates separate summer & winter reporting, and No indicates full year sample results reporting only.
(4)	Parameters measured	Currently 19 petrol parameters should be tested and reported by the Member States and 6 diesel parameters.
(a)	Additional notes	Results for the parameters Iso-propyl alcohol, Tert-butyl alcohol, Iso-butyl alcohol were not reported for petrol fuel grades.

18.1.1.1 Petrol Samples

Italy has complied with minimum sampling requirements for all petrol fuel grades. However, Italy has not taken samples of each parameter. Iso-propyl alcohol, Tert-butyl alcohol, Iso-butyl alcohol were not reported.

18.1.1.2 Diesel Samples

Diesel fuel samples tested in 2012 complied with the total minimum requirement.

18.2 Fuel Quality Monitoring 2012

18.2.1 Description of System

Responsible organisation(s)	Ministry of Environment, Territory and Sea
Fuel Quality Monitoring System (FQMS)	Statistical Model A
Country Size	Large
Summer Period	Normal
Location(s) of sampling	Service stations
Time/frequency of sampling	Samples have been taken in seven months of the year.
Specification of test methods	Italy established a fuel quality monitoring system, in accordance with the requirements of the European standard EN 14274:2003, by decree 3 February 2005.

Collection of sales data	Sales data in 2012 was collected by Ministry of Industry through an electronic questionnaire compiled by oil companies.

Other details:

- The national legislation (D.LGS. 31/03/2011 n. 55) specifies that fuels with MMT content should be labelled at the pump with the words: "Contiene additivi metallici. Solo per veicoli compatibili"
- An appropriate label shall be attached at sale outlets where petrol with a maximum ethanol content of 10% is made available to consumers. Moreover in the official web site of Italian Ministry of Environment, Territory and Sea is available the updated list of vehicles which are compatible with such petrol.

18.2.2 Fuel Quality Monitoring System

18.2.2.1 Sampling

Samples were taken monthly in each Winter and Summer period (Summer period for petrol: 1st May to 30th September). The 2012 monitoring system was set up using the statistical model A of EN 14274 (large country framework, five macro-regions). 200 petrol samples and 200 diesel fuel samples were analysed. The distribution of samples throughout the national territory was: 27% North-West, 21,25% North-East, 25,25% Centre, 16,25% South and 10,25% Islands.

The test methods required for fuel quality monitoring were performed by laboratories that regularly participate in one or more national inter-laboratory proficiency testing schemes, and that are accredited according to EN ISO 17025 or certified according to ISO 9000 standards. The proficiency testing schemes include all test methods listed in the FQMS. According to the requirements of EN 14274, analytical results for petrol and diesel fuel were reported separately for each season and for each grade.

18.2.2.2 FQMS administration

Italy established a fuel quality monitoring system, in accordance with the requirements of the European standard EN 14274:2003, by decree 3 February 2005. The 2012 national report had been drawn up on the base of a monitoring system at sale outlets distributed throughout the Italian territory. The monitoring system (sampling and measurements) was carried out by independent supervisory bodies on behalf of the main oil companies.

18.2.2.3 National Legislation that transposed the FQD

The Fuel Quality Directive was transposed by the Legislative Decree on 21 March 2005, n. 66 to the national law.

18.2.2.4 Reporting periods

Summer: 1st May – 30th September

Winter: 16th November – 15th March

18.2.3 Compliance with Fuel Quality Limit Values

Table 18-3: Petrol Fuel Grades

Unleaded Petrol (minimum RON 95) - Details of samples that exceed tolerance limits:					
Parameter	**Limit Value**	**Tolerance Limit* (TL)**	**Max/Min value of samples tested**	**No samples outside TL**	**% samples outside TL**
RON	95	94.6	94	1	0.52%
Vapour pressure kPa	60	61.3	61.6	2	2.20%
Aromatics	35	36	38.1	3	1.88%
Member State notes No details have been provided on actions taken by Italy in regards to non-compliant samples.					

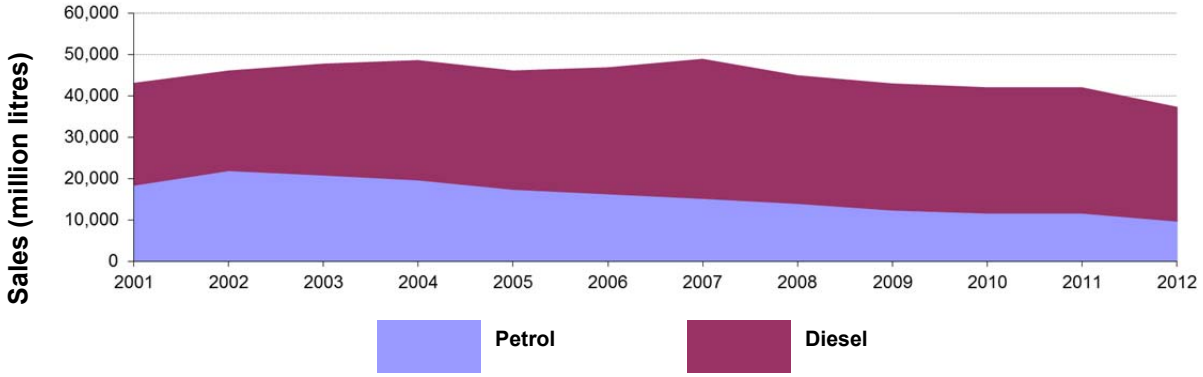
Table 18-4: Diesel Fuel Grades

Diesel Fuel B7- Details of samples that exceed tolerance limits:					
Parameter	**Limit Value**	**Tolerance Limit* (TL)**	**Max/Min value of samples tested**	**No samples outside TL**	**% samples outside TL**
Sulphur Content	10	11.8	21	2	1%
FAME Content	7	7.3	7.4	1	0.53%
Member State notes No details have been provided on actions taken by Italy in regards to non-compliant samples.					

18.3 Temporal Trends

Figure 18-2 shows the overall trend in total fuel sales for Italy since 2001. Overall, sales of both fuel grades have decreased since 2002, with some minor fluctuations (Diesel sales in 2007). Fuel sales since 2011 have continued to decrease; 9.2% (2,786 million litres) for diesel, and 16.5% (1,928 million litres) for petrol.

Figure 18-2: Temporal trends in national sales of petrol and diesel (million litres)



18.4 Statistical Analysis

The following charts in this section are known as box-plots and they display the distribution of fuel characteristics per Member State by illustrating the:

- Sample minimum
- Lower 25% range
- Middle 50% range
- Median
- Upper 25% range
- Maximum

For a full explanation of the information presented in a Box Plot diagram, please see section 4.

Fuel sampling in Italy in 2012 recorded no test results out of specification with limits. The analysis charts for petrol (Figure 18-3) and diesel (Figure 18-4) detail the distribution of sample results for the 5 selected parameters;

Petrol:

- Research Octane Number
- Motor Octane Number
- Summer Vapour Pressure

Diesel:

- Density at 15^{o}C
- Distillation – 95% v/v recovered

Sample results for these parameters have been depicted using box plots based on the reported sample minimum, lower quartile (Q1), median (Q2), upper quartile (Q3), and the maximum sample value.

18.4.1 Petrol Analysis

Sample results in 2012 have been presented in the following figures with limit values for the parameter (maximum or minimum) to demonstrate the skew of sample results. RON and MON sample results show that the fuels available in Italy have reasonably small variation in Octane levels, and the majority of samples are within limit values. Summer Vapour pressure results are mostly within limit values and show slightly more variation between samples.

Figure 18-3: Petrol analysis

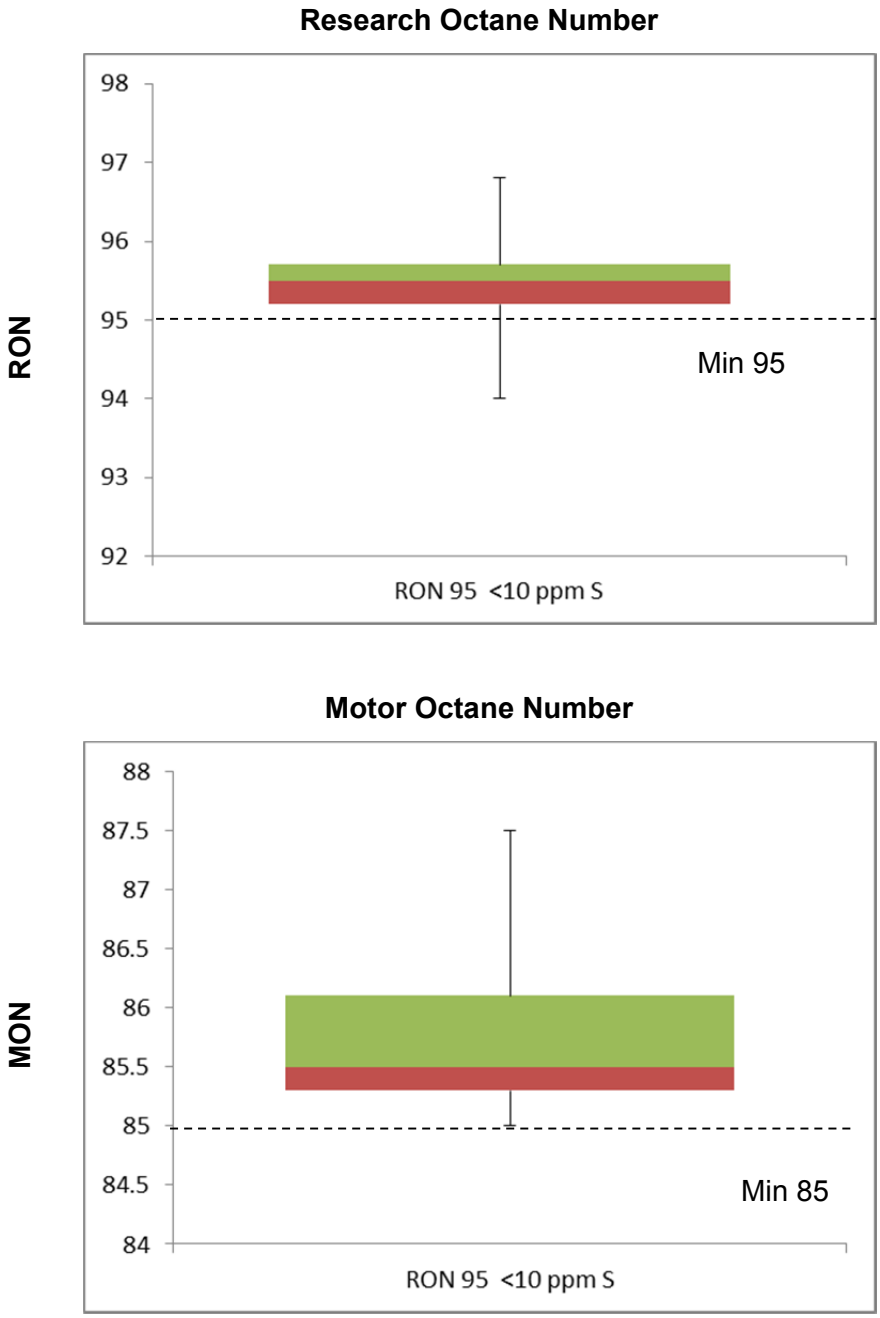
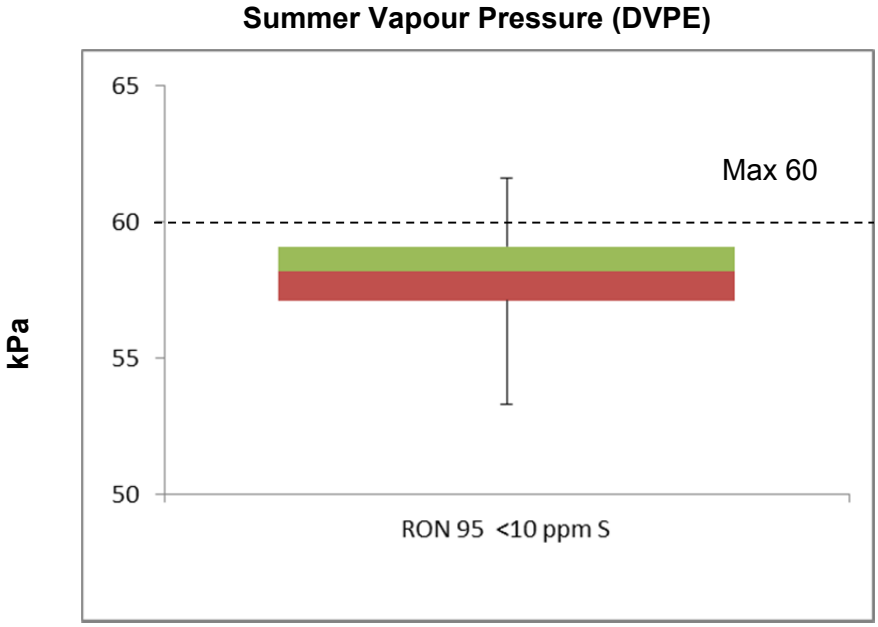


Figure 18-3: Petrol analysis (continued)



18.4.2 Diesel Analysis

Results for density and distillation show even distribution of samples, with only distillation samples showing majority distribution near to the tolerance levels and some non-compliant samples.

Figure 18-4: Diesel analysis

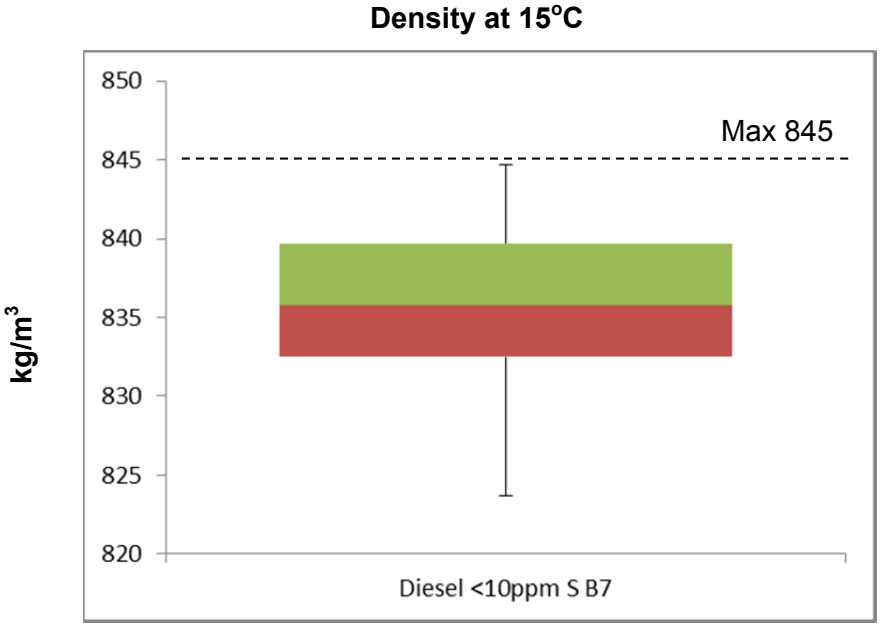
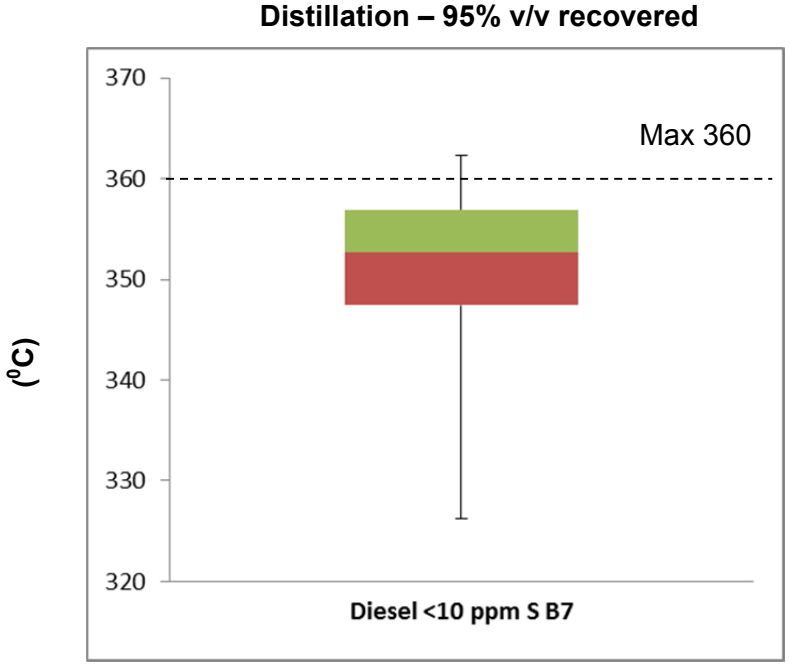


Figure 18-4: Diesel analysis (continued)



18.5 Key Areas for Improvement

The following table summarises the main areas in which improvements could be made to the monitoring system, reporting or compliance with Directive limit values. The table includes key recommendations from the previous year to give an assessment of what action has been taken by the Member State to address any issues that may have been highlighted.

Key Areas for Improvement (3 years)		
	Monitoring	**Reporting**
2012	• Italy did not report parameter results for Iso-propyl alcohol, Tert-butyl alcohol, Iso-butyl alcohol for petrol fuel grade RON 95 in 2012.	The 2012 submission was delivered on the 3rd July; received after the 30th June deadline
2011	• Italy did not report parameter results for Methanol, Iso-propyl alcohol, Tert-butyl alcohol, Iso-butyl alcohol, other oxygenates, Lead Content or Manganese for petrol fuel grade RON 95 in 2011.	The 2011 report was submitted within the reporting deadline.
2010	• 17 of 18 parameters tested. Lead content not measured.	The 2010 report was submitted after the Member State reporting deadline

19 Latvia

19.1 Fuel Availability 2012

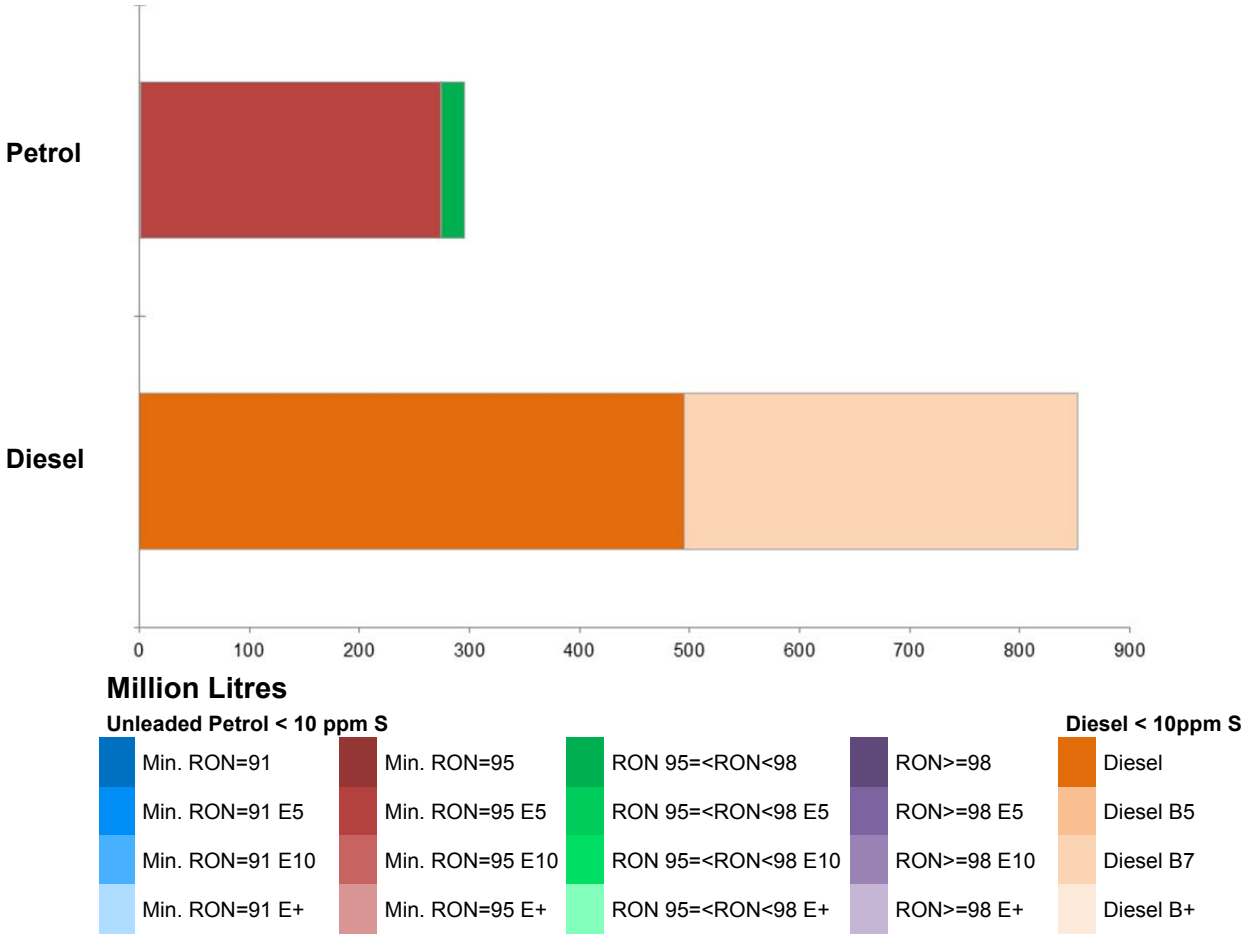
The following table lists the fuels that were reported to be available nationally in 2012.

Figure 19-1: National fuel grade

Fuel grade	National fuel grade
Unleaded petrol (minimum 95 =< RON < 98)	A-95
Unleaded petrol (minimum RON = 95) E5	A-95 E5
Unleaded petrol (minimum RON = 95) E+[2]	E85
Unleaded petrol (minimum RON >= 98)	A-98
Diesel fuel	DD
Diesel fuel B7[3]	DD B5

19.1.1 Sales, sampling and reporting

Figure 19-1: Fuel Sales proportions by fuel type



During 2012 fuel sales in Latvia were dominated by diesel fuel sales; 852 million litres of diesel (all diesel grades combined) was sold in comparison to 295 million litres of petrol fuel sales (all petrol grades combined). 92.6% of petrol fuel sales were comprised of fuel grade RON 95=<RON<98. Diesel fuel sales were almost a direct split between Diesel and Diesel B7, with 50.9% comprising of the Diesel Fuel Grade.

Table 19-1: Fuel sales and sampling

Fuel type (Parent Grade)	Sales (Million litres)	Sales, % total of fuel type	Samples [1] S	Samples [1] W	Samples [1] TR [2]	Separate S/W[3]	Parameters measured [4]	Add. Notes
Unleaded petrol min. RON=95 (<10 ppm S)	0.5	0.17%	0	0	(1)			
Unleaded petrol min. RON=95 (<10 ppm S) E5	273.2	92.65%	23	84	(50)	Yes	19 of 19	(a)
Unleaded petrol min. RON=95 (<10 ppm S) E+	0.1	0.05%	0	0	(1)			
Unleaded petrol 95=<RON<98 (<10 ppm S)	21.1	7.14%	10	41	(4)	Yes	19 of 19	
Total Petrol	**294.9**	**100.00%**	**33**	**125**	**(56)**	**Yes**	**19 of 19**	
Diesel (<10 ppm sulphur)	495	58.09%	0	101	(50)	Yes	6 of 6	
Diesel (<10 ppm sulphur) B5	357	41.91%	61	82	(50)	Yes	6 of 6	
Total Diesel	**852.3**	**100.00%**	**61**	**183**	**(100)**	**Yes**	**6 of 6**	

(1)	Samples	The actual number of samples taken by the Member State in the summer (s) and winter (w) periods
(2)	TR	Total requirement per summer and winter period according to EN 14274. Brackets () show where a national model is being used, and the requirement is indicative to demonstrate equivalence with EN14274.
(3)	Separate S & W?	Yes indicates separate summer & winter reporting, and No indicates full year sample results reporting only.
(4)	Parameters measured	Currently 19 petrol parameters should be tested and reported by the Member States and 6 diesel parameters. Latvia has reported results for all parameters in all fuel grades.
(a)	Additional Notes	Petrol fuel has been sampled and reported in combination with Petrol RON 95 and Diesel fuel has been sampled and reported in combination with Diesel B7.

19.1.1.1 Petrol Samples

Latvia has complied with minimum sampling requirements for all petrol fuel grades, but has reported parameter results for a number of grades together.

19.1.1.2 Diesel Samples

Diesel fuel samples tested in 2012 complied with the total minimum requirement for Diesel fuels. Latvia is using the national system and met the required 50 samples for summer and winter periods for Diesel fuel B5 as required for models A and C. However Latvia did not sample Diesel (<10 ppm sulphur) during the summer period.

19.2 Fuel Quality Monitoring 2012

19.2.1 Description of System

Responsible organisation(s)	Ministry of Economics of the Republic of Latvia
Fuel Quality Monitoring System (FQMS)	National system
Country Size	Small
Summer Period	Arctic
Location(s) of sampling	In 2012, 245 fuel samples (81 A-95 samples, 38 A-98 samples, 57 DD and 69 DD B5) have been collected from service stations and 157 fuel samples (26 A-95 samples, 13 A-98 samples, 44 DD and 77 DD B5) have been collected from terminals.
Time/frequency of sampling	Samples have been taken in every month throughout the year.
Specification of test methods	In compliance with Directive 98/70/EC.
Collection of sales data	State Revenue Service of Latvia.

Other details

The State Revenue Service is responsible for supervision of the fuel market in accordance with the article 24 of Consumer Rights Protection Law, Article 15 of Cabinet Regulation No 332 adopted on 26 September 2000. Requirements for Conformity Assessment of Petrol and Diesel Fuel" and Article 27 of Cabinet Regulation No 772 adopted on 18 October 2005 "Regulations Regarding Requirements for Biofuel Quality, Conformity Assessment, Market Supervision and Procedures for Consumer Information".

Latvia has been using petrol with a vapour pressure of 70kPa historically and such petrol is currently in use. The Commission raises no objection to the notification from the Republic of Latvia to permit the sale of petrol with a maximum vapour pressure of 70kPa (derogation), during the summer period, until the end of 2020.

19.2.2 Fuel Quality Monitoring System

19.2.2.1 Sampling

Organisation(s) responsible for sampling, analysis and reporting: Ministry of Economics of the Republic of Latvia and the State Revenue Service.

Location(s) of sampling: terminals and refuelling stations.

Time/frequency of sampling: samples have been taken in every month throughout the year.

Test methods: in compliance with Directive 98/70/EC.

19.2.2.2 FQMS Administration

The Ministry of Economics of the Republic of Latvia is responsible for managing and implementing the FQM Directive.

The State Revenue Service is responsible for the supervision of the fuel market, in accordance with the article 24 of Consumer Rights Protection Law, Article 15 of Cabinet Regulation No 332, adopted on 26 September 2000. Requirements for Conformity are determined by; "Assessment of Petrol and Diesel Fuel" and Article 27 of Cabinet Regulation

No 772 adopted on 18 October 2005 “Regulations Regarding Requirements for Biofuel Quality, Conformity Assessment, Market Supervision and Procedures for Consumer Information”.

The fuel circulation supervision institutions supervise the fuel conformity according to the test methods specified in the standards EN 228:2013 ”Automotive fuels - Unleaded petrol - Requirements and test methods” and EN 590+A1:2011 “Automotive fuels - Diesel - Requirements and test methods”, as well as the requirements of Cabinet Regulation No 332.

Fuel circulation supervision institutions, which perform the supervision of the fuel market, accordance with regulatory enactments, shall submit to the State Revenue Service information regarding detected infringements once a month. If the State Revenue Service needs additional information for ensuring the supervision of fuel market, it shall be provided upon written request of the State Revenue Service.

The importer, producer, wholesaler or retailer shall present documents attesting conformity of fuel upon request of fuel circulation supervision institution.

19.2.2.3 National Legislation that Transposed the FQD

Republic of Latvia Cabinet Regulation No 332 Adopted 26 September 2000 Requirements for Conformity Assessment of Petrol and Diesel Fuel. This determines technical specifications, on health and environmental grounds, for fuels which are placed on the Latvian market to be used with spark and compression ignition engines of motor vehicles, non-road mobile machinery (including inland waterway vessels when not at sea), agricultural and forestry tractors, and recreational craft when not at sea, taking account of the technical requirements of those engines).

Republic of Latvia Cabinet Regulation No 772 Adopted 18 October 2005 Regulations Regarding Requirements for Biofuel Quality, Conformity Assessment, Market Supervision and Procedures for Consumer Information: Prescribes the quality requirements for biofuel, the procedures by which the conformity assessment of biofuel and the transfer thereof for processing shall be carried out. The procedures by which the production of biofuel and blending thereof with fossil fuel shall be controlled. The procedures by which biofuel not conforming to quality requirements shall be dealt with. The procedures by which consumers shall be informed regarding the content of biofuel present at points of sale and the conformity thereof with quality requirements.

Republic of Latvia Cabinet Regulation No 545 Adopted 5 July 2011 Regulation Regarding the Sustainability Criteria for Biofuels and Bio-liquids, determines the mechanism for introducing thereof, and the procedure by Which they Shall Be Supervised and monitored.

19.2.2.4 Reporting Periods

According to Directive 98/70/EC Member States with low ambient summer temperatures are classified as Arctic country. Latvia was classified as the Arctic country.

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

There is no the transition periods between summer and winter grade fuels. Samples have been taken in every month throughout the year.

19.2.3 Compliance with Fuel Quality Limit Values

Table 19-2: Petrol Fuel Grades

Petrol - Details of samples that exceed tolerance limits:
No samples found to be out of compliance with Directive specifications.

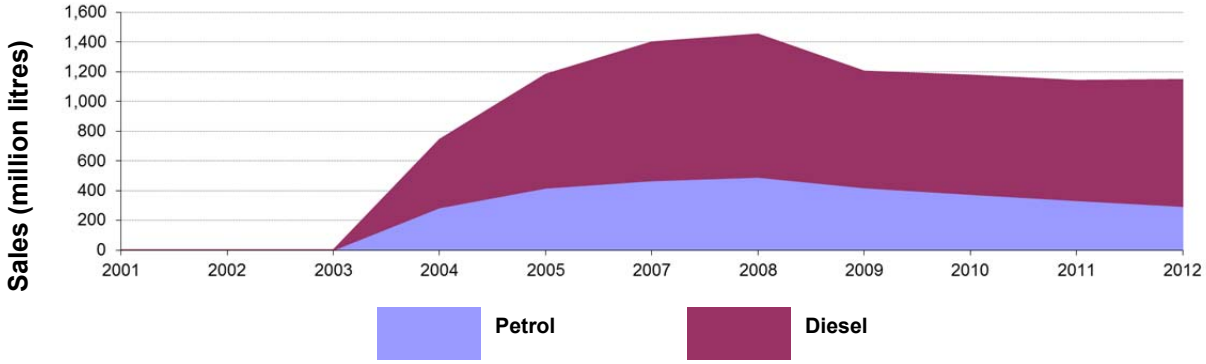
Table 19-3: Diesel Fuel Grades

Diesel - Details of samples that exceed tolerance limits:
No samples found to be out of compliance with Directive specifications.

19.3 Temporal Trends

Figure 19-2 shows the trend in total fuel sales since 2004; fuel sales rose until 2008 and then fell. Diesel and Petrol fuel sales have both increased since 2004; petrol sales only marginally by 9 million litres (3.1%), diesel sales increased dramatically by 304 million litres (46.2%). In the period 2011 to 2012 petrol sales fell by 39 million litres (11.7%), with diesel sales increasing by 45 million litres (5.6%).

Figure 19-2: Temporal trends in national sales of petrol and diesel (million litres)



19.4 Statistical Analysis

The following charts in this section are known as box-plots and they display the distribution of fuel characteristics per Member State by illustrating the:

- Sample minimum
- Lower 25% range
- Middle 50% range
- Median
- Upper 25% range
- Maximum

For a full explanation of the information presented in a Box Plot diagram, please see Section 4 of the wider report.

Fuel sampling in Latvia in 2012 recorded no test results out of specification with limits. The analysis charts for petrol (Figure 19-3) and diesel (Figure 19-4) detail the distribution of sample results for the 5 selected parameters;

Petrol:

- Research Octane Number
- Motor Octane Number
- Summer Vapour Pressure

Diesel:

- Density at 15^{o}C

- Distillation – 95% v/v recovered

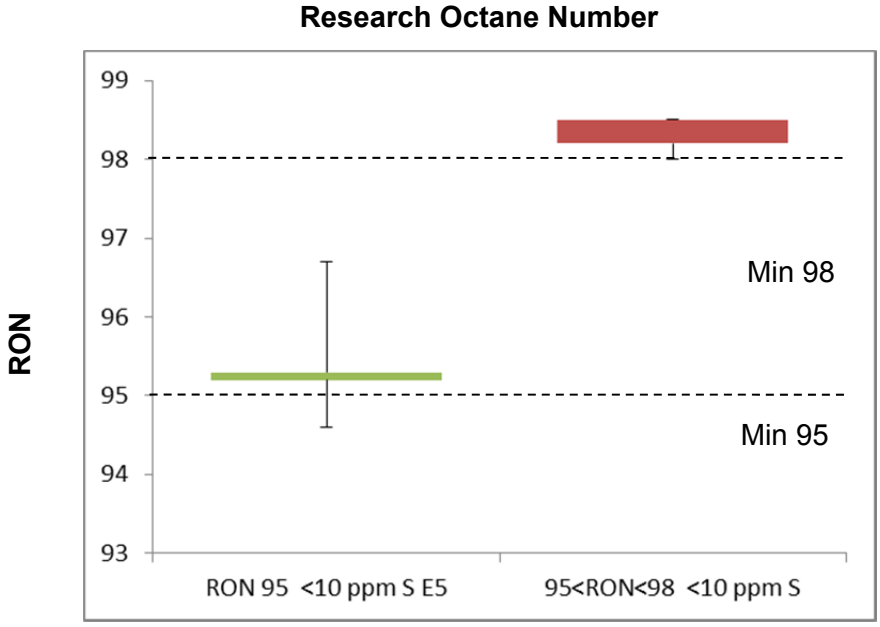
Sample results for these parameters have been depicted using box plots based on the reported sample minimum, lower quartile (Q1), median (Q2), upper quartile (Q3), and the maximum sample value.

19.4.1 Petrol Analysis

Sample results in 2012 have been presented in the following figures with limit values for the parameter (maximum or minimum) to demonstrate the skew of sample results. Analysis of octane levels shows for both the RON and MON tests the samples show very little variability. There are some samples of RON 95 which fall below limit values for the RON test but these are within limit values.

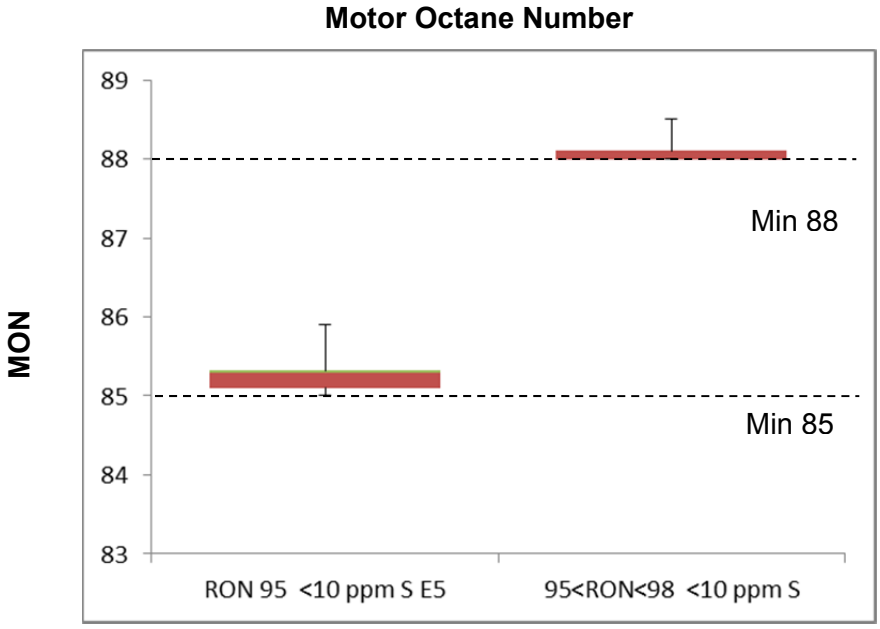
Latvia has been using petrol with a vapour pressure of 70kPa due to being classified as an arctic country. Analysis of samples for the summer vapour pressure tests shows an extraordinarily tight distribution considering the number of samples with only RON 95 being near tolerance levels (but with outlying samples being within tolerance limits).

Figure 19-3: Petrol analysis

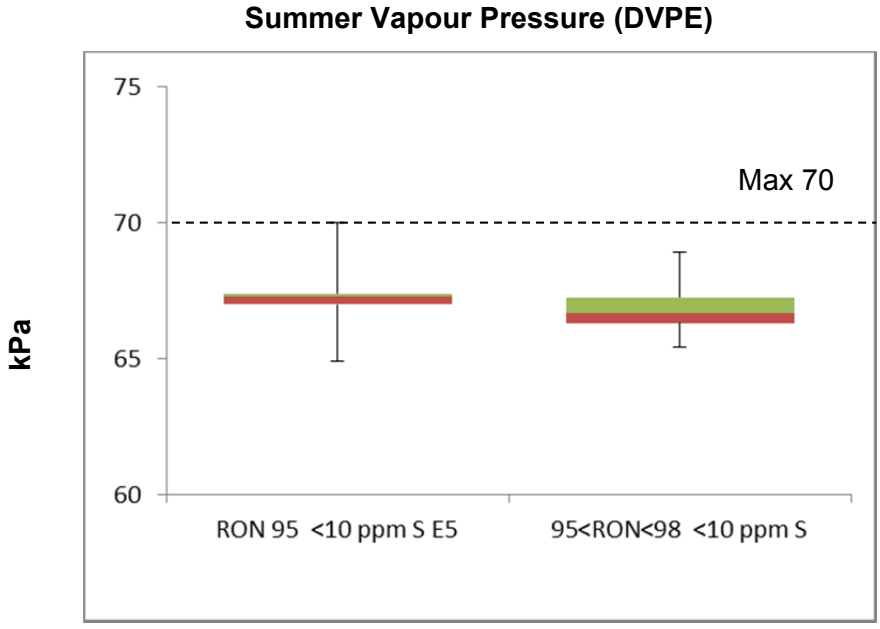


Note: Median and 25% of Sample Value equal 95.2 for RON for fuel grade A-95.
Median and 75% of Sample Value and maximum equal 98.5 for RON for fuel grade A-98

Figure 19-3: Petrol analysis (continued)



Note: Minimum and 25% of Sample Value equal 88 for MON for fuel grade A-95.



19.4.2 Diesel Analysis

Samples of diesel tested by the Density at 15°C and Distillation 95% v/v recovered, show a fairly normal distribution, which is away from limit values. Outliers remain close to limit values but well within tolerance limits.

Figure 19-4: Diesel analysis

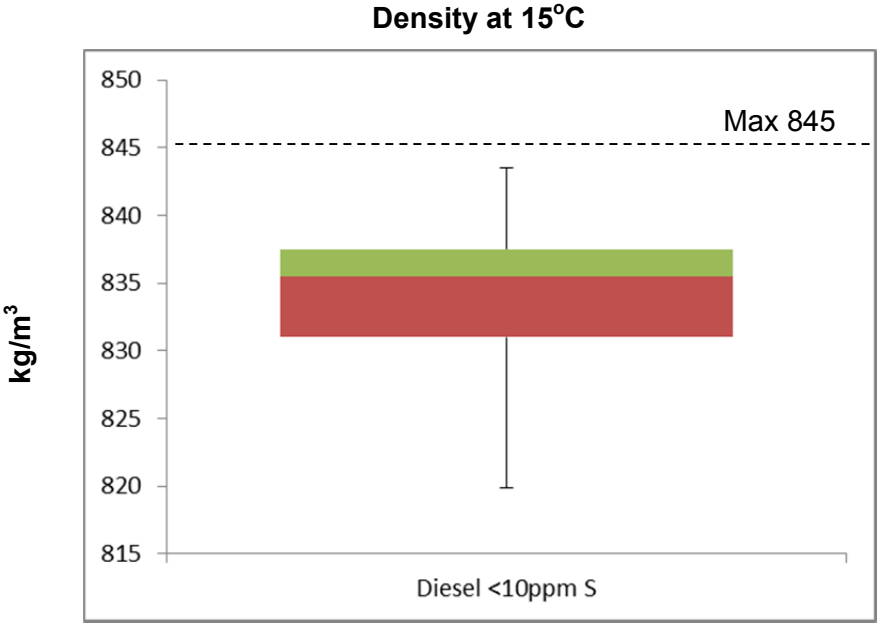
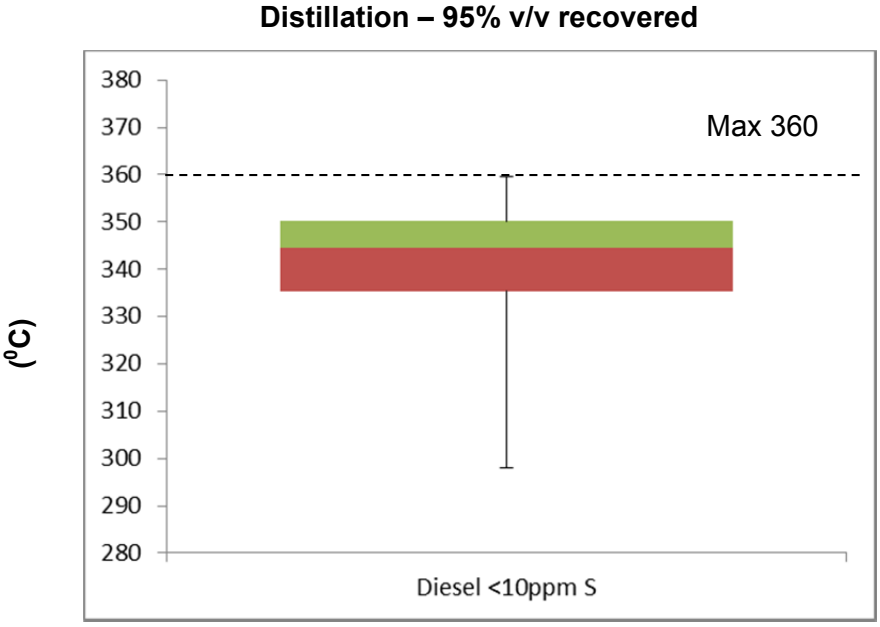


Figure 19-4: Diesel analysis (continued)



19.6 Key Areas for Improvement

The following table summarises the main areas in which improvements could be made to the monitoring system, reporting or compliance with Directive limit values. The table includes key recommendations from the previous year to give an assessment of what action has been taken by the Member State to address any issues that may have been highlighted.

Key Areas for Improvement (3 years)		
Year	**Monitoring**	**Reporting**
2012	• The number of samples did not meet minimum requirement to comply with EN 14274; 50 samples are required for each period, which Latvia did not provide.	The file was received on the 3rd July, after the 30th June deadline.
2011	• No comment.	The 2011 report was submitted within Member State deadline.
2010	• No detail is given on the split of samples taken so cannot determine if sampling at fuel stations is sufficient. • No breakdown of sales by region.	No details provided on the number of samples which have exceeded the tolerance limit. The source of sales data for 2010 has not been provided.

20 Lithuania

20.1 Fuel Availability 2012

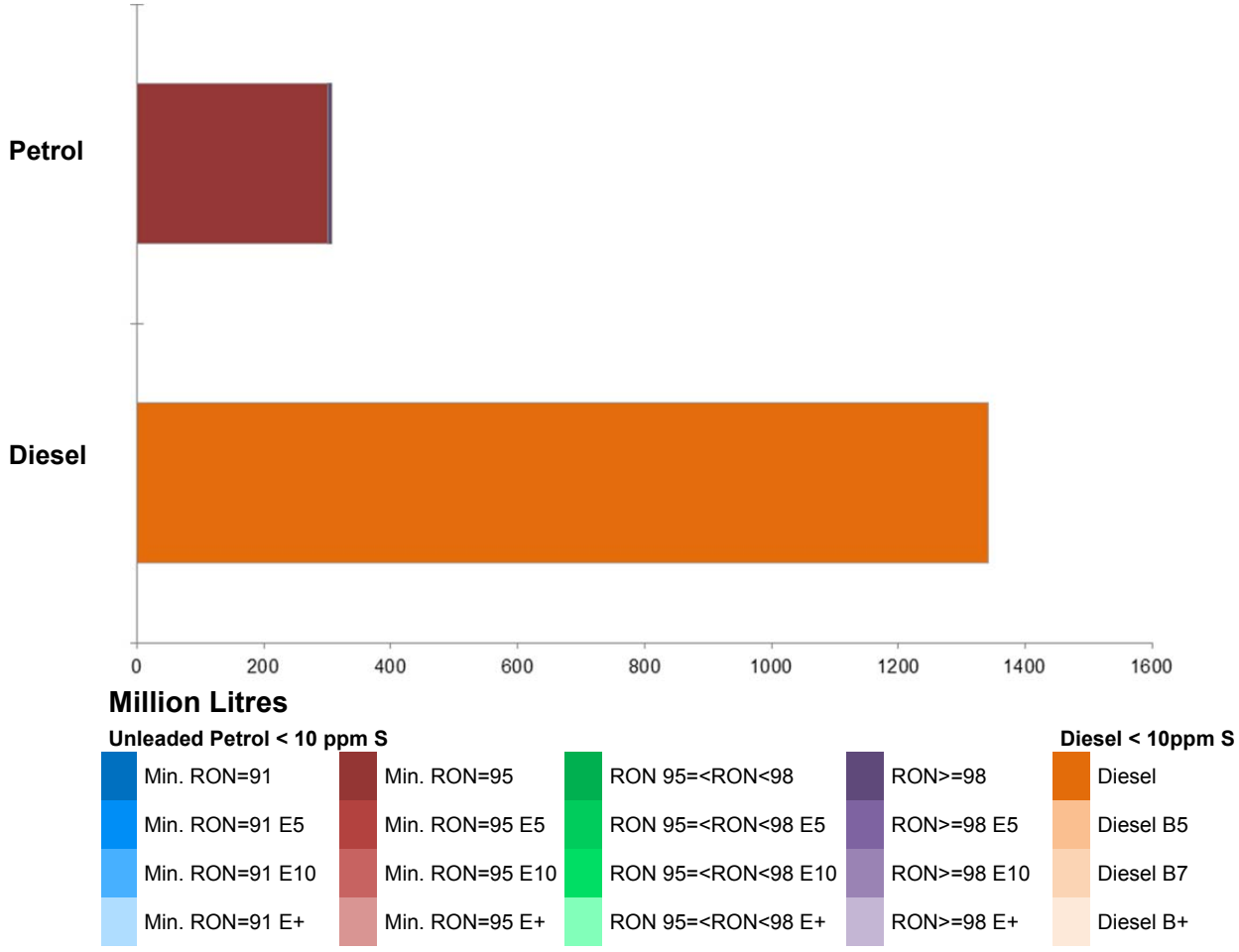
The following table lists the fuels that were reported to be available nationally in 2012.

Table 20-1: National fuel grade

Fuel grade	National fuel grade
Unleaded petrol (minimum RON = 95)	A-95 (RON 95)
Unleaded petrol (minimum RON >= 98)	A-98 (RON 98)
Diesel fuel	Diesel

20.1.1 Sales, sampling and reporting

Figure 20-1: Fuel Sales proportions by fuel type



During 2012 fuel sales in Lithuania were dominated by diesel fuel sales. Over 1,300 million litres of diesel was sold in comparison to just over 300 million litres petrol fuel sales (all petrol grades combined). Petrol fuel sales were mainly comprised of fuel grade RON 95 with a small proportion (2.0%) of RON 98.

According to European Directive 2009/28/EC and national legislation in Lithuania, it is obligatory to blend biofuel with petrol and diesel. Petrol A-95 sold in Lithuania must contain 5 % to 10 % v/v ethanol. Mandatory part of ethanol in petrol A-95 must be 5%. Ethanol blend mean in petrol – 4.788 % v/v. There is no requirement of blending as regards petrol A-98.

Diesel sold in Lithuania must contain 7 % v/v FAME. FAME blend mean in diesel – 5.01 % v/v.

Table 20-2: Fuel sales and sampling

Fuel type (Parent Grade)	Sales (Million litres)	Sales % total of fuel type	Samples (1) S	Samples (1) W	Samples (1) TR (2)	Separate S/W(3)	Para-meters measured (4)	Add. Notes
Unleaded petrol min. RON=95 (<10 ppm S)	300	97.83%	50	50	50	Yes	18 of 19	(a)
Unleaded petrol RON>=98 (<10 ppm S)	7	2.17%	4	2	2	Yes	18 of 19	
Total Petrol	**307**	**100.00%**	**54**	**52**	**52**	**Yes**	**18 of 19**	
Diesel (<10 ppm sulphur)	1,342	100.00%	50	50	50	Yes	6 of 6	
Total Diesel	**1,342**	**100.00%**	**50**	**50**	**50**	**Yes**	**6 of 6**	

(1)	Samples	The actual number of samples taken by the Member State in the summer (s) and winter (w) periods
(2)	TR	Total requirement per summer and winter period according to EN 14274. Brackets () show where a national model is being used, and the requirement is indicative to demonstrate equivalence with EN14274.
(3)	Separate S & W?	Yes indicates separate summer & winter reporting, and No indicates full year sample results reporting only.
(4)	Parameters measured	Currently 19 petrol parameters should be tested and reported by the Member States and 6 diesel parameters.
(a)	Additional Notes	Lithuania started testing the levels of Manganese in unleaded petrol min RON=95 (<10 ppm S) from November 2012. There were 11 samples tasted for Manganese.

20.1.1.1 Petrol Samples

- Lithuania has almost fully complied with minimum sampling requirements for all petrol fuel grades in 2012; however 100 samples are required from service stations but only 87 had been taken.
- A small country using statistical model C, Lithuania have taken 50 samples in both summer and winter periods for all fuels that exceed 10% total market share.

20.1.1.2 Diesel Samples

- Diesel sampling did not quite comply with minimum sampling requirements as 87 samples were taken from service stations, not 100.

20.2 Fuel Quality Monitoring 2012

20.2.1 Description of System

Responsible organisation(s)	Ministry of Energy of the Republic of Lithuania

Fuel Quality Monitoring System (FQMS)	EN 14274 Statistical Model C
Country Size	Small
Summer Period	Normal – However, Lithuania report to 70kPa for summer vapour pressure which is more in line with an artic summer period. This has been agreed previously with the Commission. Lithuania has provided the derogation on summer vapor pressure limit of 70kPa, which they had received from the European Commission.
Location(s) of sampling	Samples of fuel A-95 taken: 87 samples - at fuel stations, 12 - at terminals, 1 - at refinery; Samples of diesel taken: 89 samples at fuel stations, 10 - at terminals, 1 - at refinery. There is 1 national refinery and 23 distribution terminals in the country. Samples were taken at every month during the year. Samples are selected and taken according to the standard LST EN 14274:2004 which fully corresponds to the requirements of standard EN 14274:2003
Time/frequency of sampling	Monthly throughout the year, with the exception of fuel grade A-98 which has been sampled six months out of the year, in January, March, May, July and September.
Specification of test methods	FQMS implementation is based essentially on test methods situated in international standards EN 228 and EN 590. Other FQMS test methods in Lithuania are not used. In Lithuania the Lithuanian standard LST EN 14274:2004 which has been fully taken over from the European standard EN 14274:2003 is in use.
Collection of sales data	Source of sales data for 2012 has not been specified.

Other details

Vapour pressure waiver has been granted for Lithuania by the European Commission Directorate-General, Climate Action, CLIMA.C.2 - Transport and Ozone by the Note No. CLIMA/CPO/SS/nv Ares (2011).

The public body responsible for managing and implementing the FQM Directive is the Ministry of Energy. Fuel sampling is carried out by the State Non Food Products Inspectorate under the Ministry of Economy. The State Non Food Products Inspectorate under the Ministry of Economy is responsible for taking action where non-compliant samples have been discovered. The system has been designed using the model C from standard EN 14274. There is 1 national refinery and 23 distribution terminals in the country.

20.2.2 Fuel Quality Monitoring System

20.2.2.1 Sampling

The organisation responsible for sampling and analysis is the State Non Food Products Inspectorate under the Ministry of Economy. The organisation responsible for reporting is the Ministry of Energy. Samples of fuel A-95 taken: 87 samples - at fuel stations, 12 - at terminals, 1 - at refinery; Samples of diesel taken: 89 samples at fuel stations, 10 - at

terminals, 1 - at refinery. There is 1 national refinery and 23 distribution terminals in the country. One sample per year is taken from a specific location. Samples are selected and taken according to the standard LST EN 14274:2004 which fully corresponds to the requirements of standard EN 14274:2003.

20.2.2.2 FQMS administration

The public body responsible for managing and implementing the FQM Directive is the Ministry of Energy. Fuel sampling is carried out by the State Non Food Products Inspectorate under the Ministry of Economy. The State Non Food Products Inspectorate under the Ministry of Economy is responsible for taking action where non-compliant samples have been discovered. The system has been designed using the model C from standard EN 14274. There is 1 national refinery and 23 distribution terminals in the country.

20.2.2.3 National Legislation that transposed the FQD

Standards of fuel EN 228 and diesel EN 590 are transposed to national legal acts. All acts are related to research of parameters of fuel and diesel samples and are fully transposed to the Lithuanian legislation. EN 14274:2003 corresponds to the LST EN 14274:2004; EN 14275:2003 corresponds to the LST EN 14275:2004; EN ISO 3170:2004 corresponds to the LST EN ISO 3170:2004; EN ISO 5164:2005 corresponds to the LSTEN ISO 5164:2006; EN ISO 5163:2005 corresponds to the LST EN ISO 5163:2006; EN 13016-1:2007 corresponds to the LST EN 13016-1:2007; EN ISO 3405:2011 corresponds to the LST EN ISO 3405:2011; EN ISO 22854:2008 corresponds to the LST EN ISO 22854:2009; EN 13132:2000 corresponds to the LST EN 13132:2001; EN ISO 20846:2011 corresponds to the LST EN ISO 20846:2012; EN 237:2004 corresponds to the LST EN 237:2004; EN 16135:2011 corresponds to the LST EN 16135:2012; EN 15195:2007 corresponds to the LST EN 15195:2007; EN 116:1997 corresponds to the LST EN :1999; EN 12916:2006 corresponds to the LST EN 12916:2006; EN 14078:2009 corresponds to the LST EN 14078:2010.

20.2.2.4 Reporting periods

Summer period: 1st May – 30th September

Winter period: 1st October – 30th April

There are two transition periods: between 1st October – 30th of November and between 1st - 30th of March. Samples taken during transition periods are reported as winter samples as there are no filtering and cloud temperatures.

20.2.3 Compliance with Fuel Quality Limit Values

Table 20-3: Petrol Fuel Grades

Petrol – A-95 - Details of samples that exceed tolerance limits:
No samples have exceeded specifications.
Petrol – A-98 - Details of samples that exceed tolerance limits:
No samples have exceeded specifications.

Table 20-4: Diesel Fuel Grades

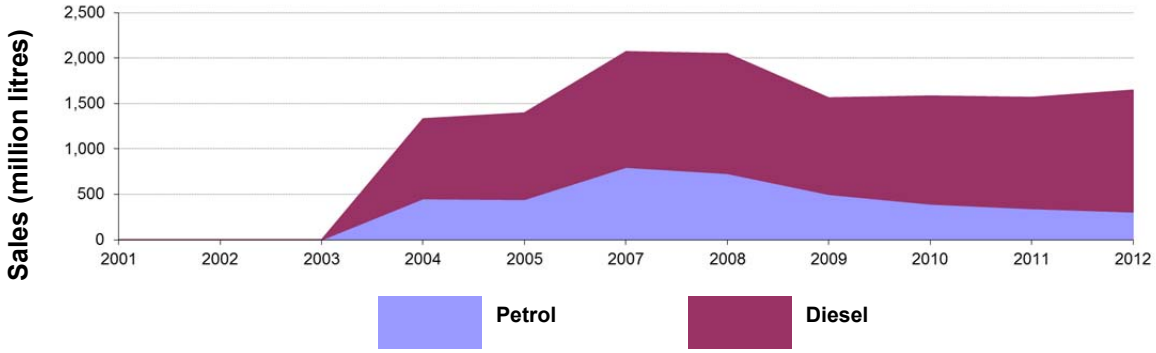
Diesel - Details of samples that exceed tolerance limits:
No samples have exceeded specifications.

20.3 Temporal Trends

Figure 20-2 shows the trend in total fuel sales since 2003. Since 2011 diesel sales in Lithuania have increased by 9.6%, with an increase of 34.4% since 2004. Petrol fuel sales

have reduced by 10.7% in the period between 2011 and 2012, with an overall reduction of 47.6% in the period 2004-2012.

Figure 20-2: Temporal trends in national sales of petrol and diesel (million litres)



20.4 Statistical Analysis

The following charts in this section are known as box-plots and they display the distribution of fuel characteristics per Member State by illustrating the:

- Sample minimum
- Lower 25% range
- Middle 50% range
- Median
- Upper 25% range
- Maximum

For a full explanation of the information presented in a Box Plot diagram, please see Section 4 of the wider report.

Fuel sampling in Lithuania in 2012 recorded no test results out of specification with tolerance limits. The analysis charts for petrol (Figure 20-3) and diesel (Figure 20-4) detail the distribution of sample results for the 5 selected parameters;

Petrol:

- Research Octane Number
- Motor Octane Number
- Summer Vapour Pressure

Only four samples have been taken for petrol grade RON 98 – as a result it is not possible to perform statistical analysis on this fuel grade, Figure 21-3 therefore only gives details for grade RON 95.

Diesel:

- Density at 15^{o}C
- Distillation – 95% v/v recovered

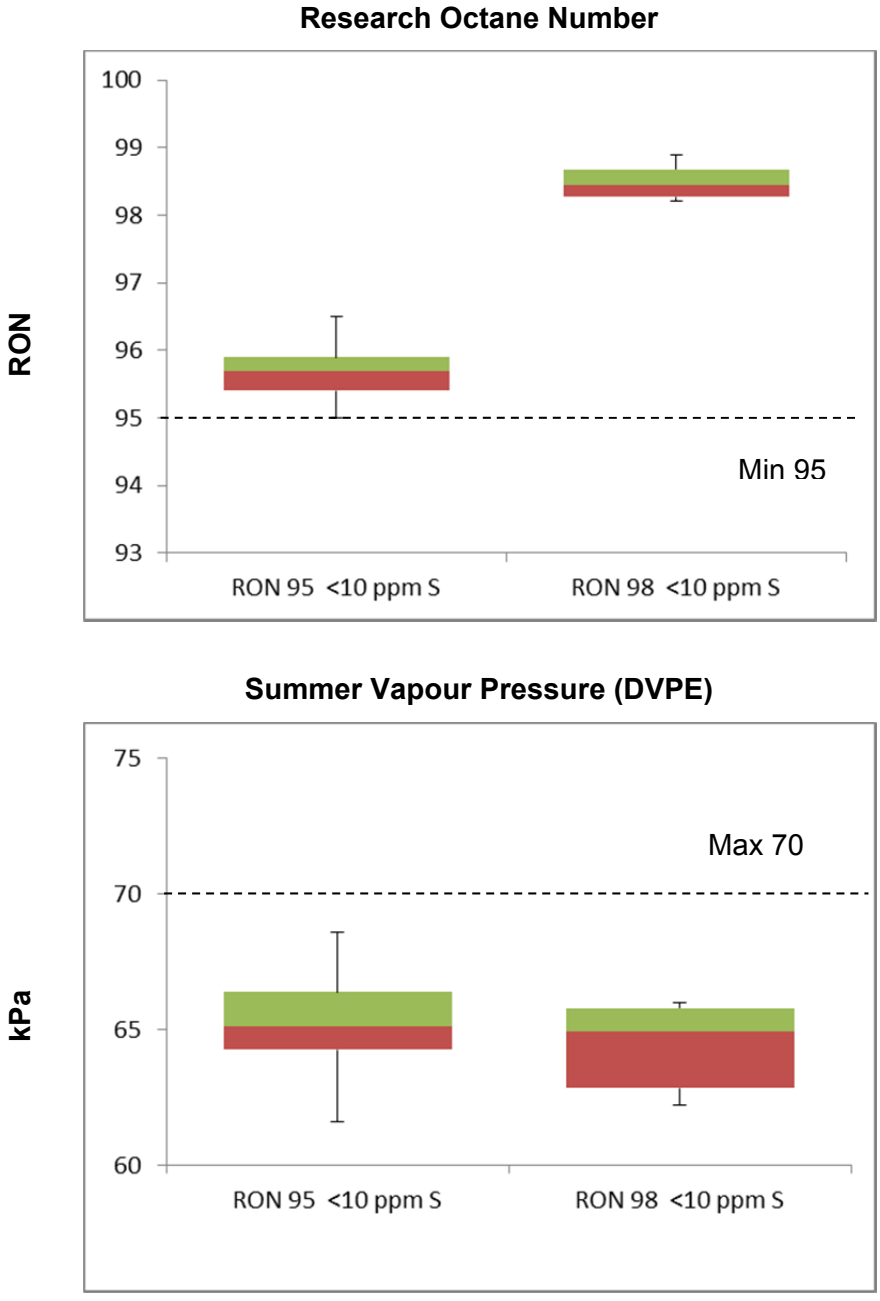
Sample results for these parameters have been depicted using box plots based on the reported sample minimum, lower quartile (Q1), median (Q2), upper quartile (Q3), and the maximum sample value.

20.4.1 Petrol Analysis

Sample results in 2012 have been presented in the following figures with limit values for the parameter (maximum or minimum) to demonstrate the skew of sample results. Some of Lithuanian's statistical results show anomalies (e.g. median value larger than 75% sample value), which have prevented box plots being shown for all fuel grades and parameters. It also meant that MON results cannot be shown.

Lithuania reported using the maximum limit value of 70kPa for summer vapour pressure following receipt of derogation on summer vapour pressure limit from the Commission. Vapour pressure results show that most samples remain well within the 70kPa maximum tolerance limit with no outlying samples actually exceeding the limit values.

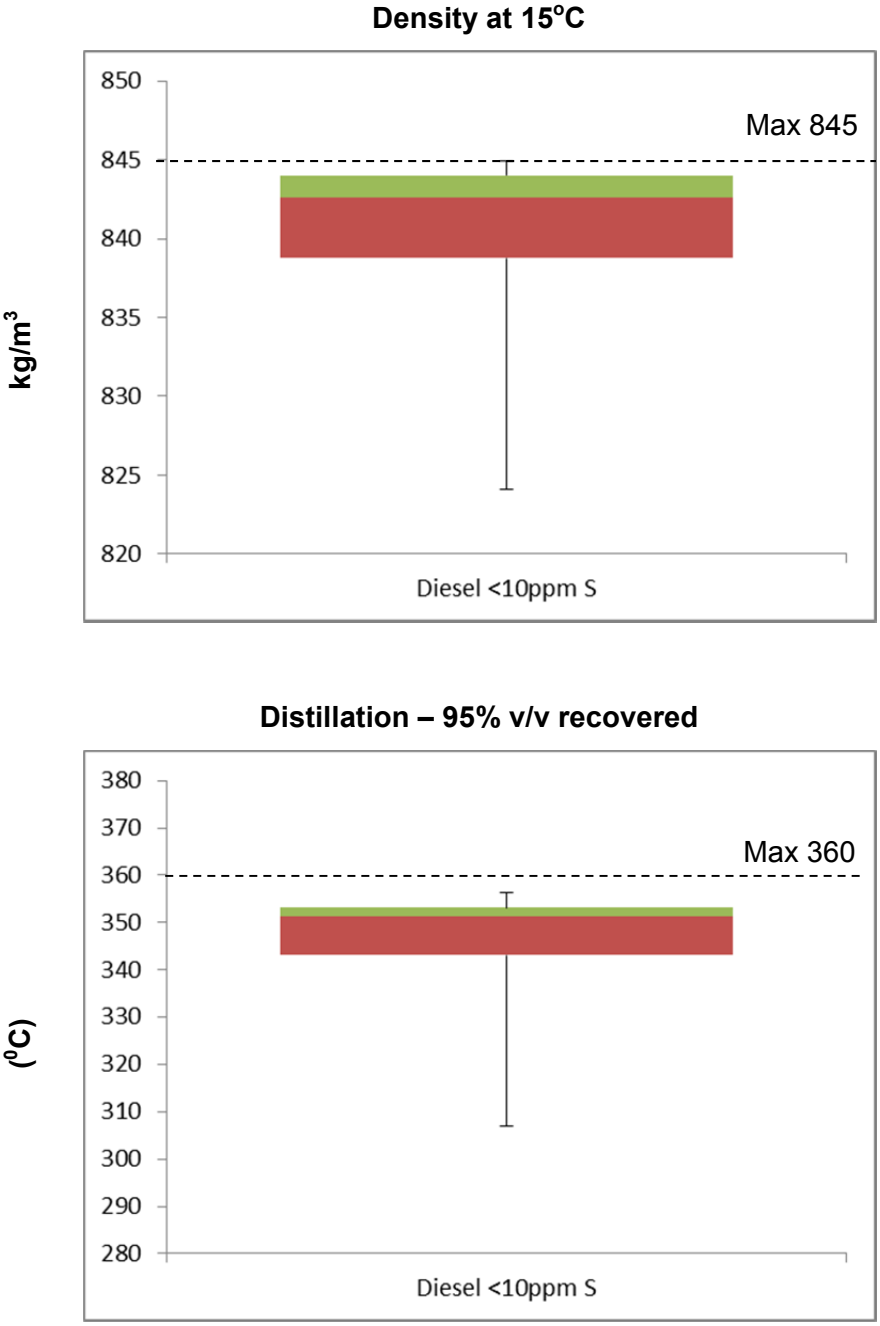
Figure 20-3: Petrol analysis



20.4.2 Diesel Analysis

All diesel sample results remained within the maximum limiting values for the two parameters analysed. Whilst the outliers – maximum and minimum values were tight to specification, the majority of samples reported remained comfortably within maximum limiting values.

Figure 20-4: Diesel analysis



20.5 Key Areas for Improvement

The following table summarises the main areas in which improvements could be made to the monitoring system, reporting or compliance with Directive limit values. The table includes key recommendations from the previous year to give an assessment of what action has been taken by the Member State to address any issues that may have been highlighted.

Key Areas for Improvement (3 years)		
	Monitoring	**Reporting**
2012	• As in 2010 and 2011, Lithuania is nearly fully compliant with sampling requirements, however take just short of the minimum number of required samples from service stations. Any samples taken in terminals or from refineries should be taken in addition to the minimum requirement from fuel dispensing sites (service stations). • The check of manganese has been started since November 2012. The manganese content in petrol has been checked in 11 samples. According to the Directive 2009/30/EC until January 1, 2014 the permissive norm is 6 mg/l. The permissive norms haven‘t been exceeded.	• Lithuania reported on the 7th June, well within the stipulated deadline of 30th June
2011	• As in 2010, Lithuania is nearly fully compliant with sampling requirements, however take just short of the minimum number of required samples from service stations. Any samples taken in terminals or from refineries should be taken in addition to the minimum requirement from fuel dispensing sites (service stations). • Lithuania did not report parameter results for Manganese in any petrol grade in 2011.	• Only fuels with no biofuel content have been reported in Lithuania in 2011. • Lithuania has not reported any sampling or results for manganese in 2011.
2010	• Lithuania are nearly fully compliant with a small country using statistical Model C, however any samples taken from terminals or refineries should be taken in addition to the minimum number of samples from service stations.	• Only one sample was found to be non-compliant in Lithuania in 2010 – Lithuania has provided almost all detail required, however have not provided information about the non-compliant sample (sample location/ when the sample was taken or why the sample exceeded specifications – if an investigation was carried out.

21 Luxembourg

21.1 Fuel Availability 2012

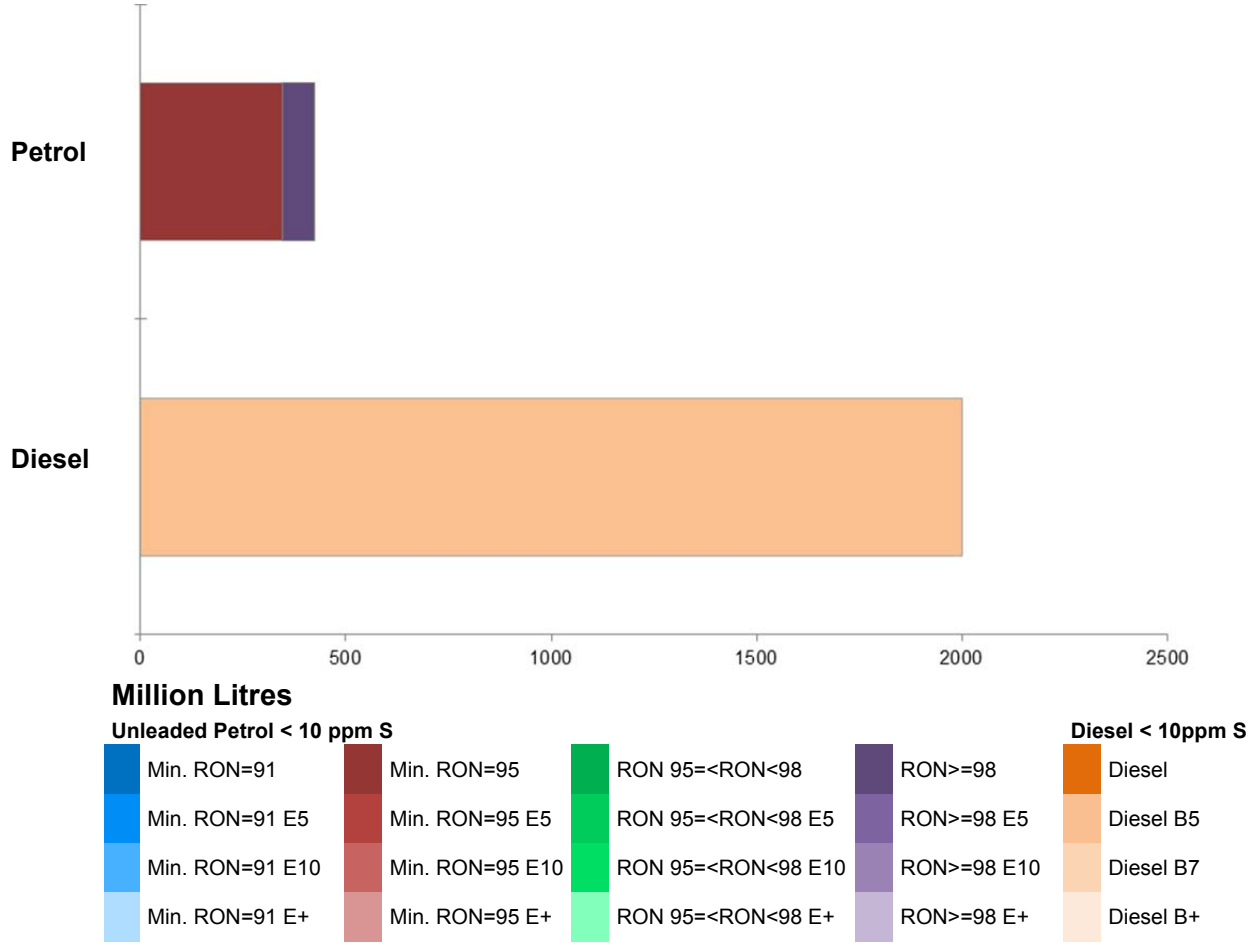
The following table lists the fuels that were reported to be available nationally in 2012.

Table 21-1: National fuel grade

Fuel grade	National fuel grade
Unleaded petrol (minimum RON = 95) E5	EURO 95
Unleaded petrol (minimum RON >= 98) E5	EURO 98
Diesel fuel B5	Diesel fuel

21.1.1 Sales, sampling and reporting

Figure 21-1: Fuel Sales proportions by fuel type



In 2012 fuel sales in Luxembourg were heavily dominated by diesel fuel sales. More than 2,000 million litres of diesel was sold in comparison to just over 420 million litres petrol fuel sales (all petrol grades combined). All fuels sold in Luxembourg in 2012 contained a maximum biofuel content of 5% and petrol fuel sales were mainly comprised of fuel grade RON 95 (81.8%).

Table 21-2: Fuel sales and sampling

Fuel type (Parent Grade)	Sales (Million litres)	Sales % total of fuel type	Samples (1) S	Samples (1) W	Samples (1) TR (2)	Separate S/W(3)	Para-meters measured (4)	Add. Notes
Unleaded petrol min. RON=95 (<10 ppm S)	347	81.85%	34	21	(50)	Yes	19 of 19	
Unleaded petrol RON>=98 (<10 ppm S)	77	18.15%	19	6	(50)	Yes	18 of 19	(a)
Total Petrol	**424**	**100.00%**	**53**	**27**	**(100)**	**Yes**		
Diesel (<10 ppm sulphur)	2,001	100.00%	60	22	(50)	Yes	6 of 6	
Total Diesel	**2,001**	**100.00%**	**60**	**22**	**(50)**	**Yes**	**6 of 6**	

(1)	Samples	The actual number of samples taken by the Member State in the summer (s) and winter (w) periods
(2)	TR	Total requirement per summer and winter period according to EN 14274. Brackets () show where a national model is being used, and the requirement is indicative to demonstrate equivalence with EN14274.
(3)	Separate S & W?	Yes indicates separate summer & winter reporting, and No indicates full year sample results reporting only.
(4)	Parameters measured	Currently 19 petrol parameters should be tested and reported by the Member States and 6 diesel parameters.
(a)	Add. Notes	Luxembourg did not report results for Manganese in petrol fuel grade RON98.

21.1.1.1 Petrol Samples

Luxembourg did not comply with the equivalent minimum sampling requirements in 2012. For a Member State classified as 'small' (with fuel sales of less than 15 million tonnes) using a National system with no regional sampling breakdown, to demonstrate statistical equivalence with EN 14274 requirements, there should be a minimum of 50 samples tested and reported for each fuel grade with a market share of over 10% per summer and winter period. The Luxembourg national monitoring system has not demonstrated equivalence in sampling quantity for any of the fuel grades sold in 2012.

21.1.1.2 Diesel Samples

Diesel fuel samples taken in the summer period did not comply with the minimum sampling requirement to demonstrate equivalence with EN14274 standards. Winter sampling figures have exceeded the minimum requirement of 50 samples, but summer sampling figures did not.

21.2 Fuel Quality Monitoring 2012

21.2.1 Description of System

Responsible organisation(s)	Administration de l'environnement (The Luxembourg Environnemental Administration)
Fuel Quality Monitoring System (FQMS)	National Model
Country Size	Small
Summer Period	Normal

Location(s) of sampling	Mainly service stations, some terminal sampling
Time/frequency of sampling	Petrol sampling: 8 samples for each period (summer and winter) were taken directly at the depot in Bertrange. 25 samples for each period were be taken randomly at different petrol stations. Diesel sampling: 3 samples for each period should be taken at each of the six fuel stations at Aire de Berchem, Aire de Capellen and Aire de Wasserbillig (covering 50 % of the total diesel sales in Luxembourg) (36 samples); 25 samples for each period taken randomly at the other filling stations (50 samples).
Specification of test methods	Every company or laboratory willing to take samples or willing to analyse the fuel samples need to be accredited by the Environmental Administration. A list of all these companies can be found on the website of the Administration.
Collection of sales data	The source of sales data in 2012 has not been provided.

Other details

Model C of the EN 14274 requires that small countries should take at least 50 samples for each grade of petrol (RON 95; RON 98) and 50 samples for diesel. In total, Luxembourg must therefore take at least 250-300 samples per year (depending on the outcome of the calculation method). In 2009, the Luxembourgish Environmental Administration worked out, in collaboration with the Austrian federal Environment Agency, determined a concept to improve sampling, and respectively established a national fuel quality monitoring system. A two day workshop was held with the intention to bring all stakeholders together and to discuss different proposals as well as to create a possible way forward. Beside the project partners, various representatives (from the mineral oil industry, fuels laboratories or other EU countries where a FQMS was already established), attended the meeting.
The main outcome was:
-It's possible to reduce the number of samples for diesel to a minimum amount of 86 samples a year instead of 100 (EN 14274);
-It's possible to reduce the number of samples for petrol grades (RON 95, RON 98) to a minimum amount of 66 samples instead of 2 x 100 (EN 14274) without degrading the informative value and quality of the monitoring system.
Special circumstances allow Luxembourg to lower the amount of samples required by the EN 14274. The following points shall help to comprehend the reasoning of how the total amount of only 152 samples, instead of 250-300, can be obtained.

21.2.2 Fuel Quality Monitoring System

21.2.2.1 Sampling

Fuels have to fulfil the requirements of the FQD, annexe I to III. Test methods are those specified in EN 228 and EN 590. The samples have to be taken in accordance to the methods described in the European standards:
- EN 14275, if taken at the fuel station and
- EN ISO 3170, if taken at the terminal.

The number of samples is determined by a national system in an approach to the European standard EN 14274.

21.2.2.2 FQMS administration

The Environment Agency (Administration de l'environnement), technical department of the Ministry of sustainable development and infrastructures sets up the national FQMS and is in charge of the fuel quality monitoring.

21.2.2.3 National Legislation that transposed the FQD

The grand-ducal ordinance 16 March 2012 *on the quality of petrol and diesel fuels used and sustainable use of biofuels* transposes the FQD in national law. (Règlement grand-ducal du 16 mars 2012 *concernant la qualité de l'essence et des carburants diesel et l'utilisation durable des biocarburants*, Mém. A - 55 du 26.03.2013, p. 626, www.legilux.lu)

21.2.2.4 Reporting periods

Article 9 of the ordinance requires that fuel suppliers introduce for the 1st march, at the latest of each year, a report containing the total volume of each type of fuel put on the market between the 1st January and 31st December of the previous year, including the point(s) of purchase as well as the origin of the products. Article 15 additionally requires that suppliers report on an annual basis all the fuel stations they supplied and, within the realms of possibility, give information about the chain of supply of these fuel stations.

Summer period: 1st May – 15th September

Winter period: 1st October – 15th April

There is a transition period from 16th September to 30th September and 16th April to 30th April to allow the transition from summer to winter quality and vice versa.

21.2.3 Compliance with Fuel Quality Limit Values

Table 21-3: Petrol Fuel Grades

E95 Petrol - Details of samples that exceed tolerance limits:					
Parameter	**Limit Value**	**Tolerance Limit* (TL)**	**Max/Min value of samples tested**	**No samples outside TL**	**% samples outside TL**
RON	95	94.5	94.3	5	9.10%
Member State notes With regard to samples found to be out of compliance with specifications, an item of written comment had to be delivered by the operating company.					
E98 Petrol - Details of samples that exceed tolerance limits:					
Parameter	**Limit Value**	**Tolerance Limit* (TL)**	**Max/Min value of samples tested**	**No samples outside TL**	**% samples outside TL**
Summer vapour pressure, kPa	60	61.3	66.1	3	15.79%
Member State notes With regard to samples found to be out of compliance with specifications, an item of written comment had to be delivered by the operating company.					

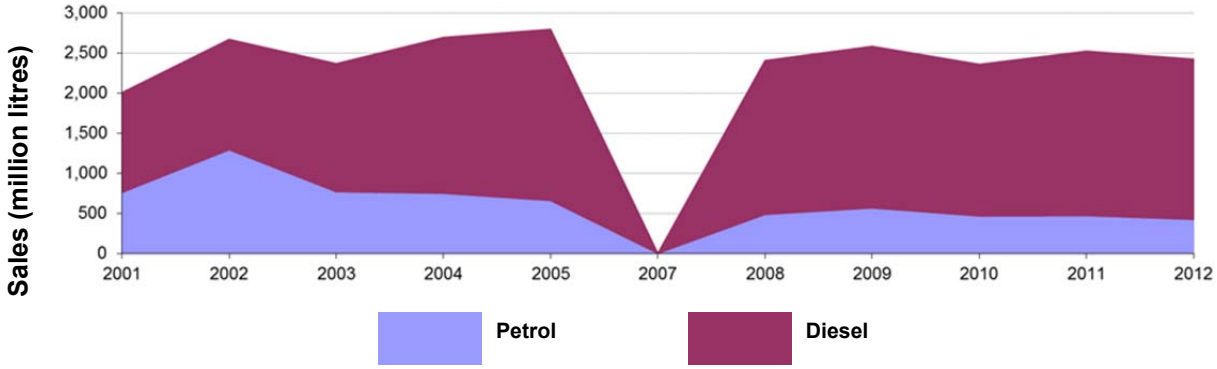
Table 21-4: Diesel Fuel Grades

Diesel - Details of samples that exceed tolerance limits:
No non compliances were found in samples taken.

21.3 Temporal Trends

Figure 21-2 shows the trend in total fuel sales in Luxembourg since 2001; showing an overall increase in diesel sales and decrease in petrol sales. Sales of both petrol and diesel have decreased in the period 2011 to 2012, with a 9.9% decrease of petrol sold (47 million litres) and a 2.6% decrease of diesel sold (53 million litres). Since 2001, diesel sales have increased by 754 million litres, whilst petrol sales have decreased significantly by 336 million litres (423 from 759 million litres).

Figure 21-2: Temporal trends in national sales of petrol and diesel (million litres)



21.4 Statistical Analysis

The following charts in this section are known as box-plots and they display the distribution of fuel characteristics per Member State by illustrating the:

- Sample minimum
- Lower 25% range
- Middle 50% range
- Median
- Upper 25% range
- Maximum

For a full explanation of the information presented in a Box Plot diagram, please see Section 4.

Fuel sampling in Luxembourg in 2012 recorded relatively few test results out of specification with limits – however low sample figures mean that these non-compliances formed 5.6% of petrol sampling and 1% diesel sampling – which is proportionally high. The analysis charts for petrol (Figure 21-3) and diesel (Figure 21-4) detail the distribution of sample results for the 5 selected parameters;

Petrol:

- Research Octane Number
- Motor Octane Number
- Summer Vapour Pressure

Diesel:

- Density at 15^{o}C
- Distillation – 95% v/v recovered

Sample results for these parameters have been depicted using box plots based on the reported sample minimum, lower quartile (Q1), median (Q2), upper quartile (Q3), and the maximum sample value.

21.4.1 Petrol Analysis

Sample results reported for 2012 have been presented in the following figures with limit values for the parameter (maximum or minimum) to demonstrate the skew of results.

RON and MON sample results show that the fuels available in Luxembourg have reasonably small variation in Octane levels – however both parameters have been exceeded by one or more sample in 2012.

Luxembourg reports according to 'normal' climactic conditions and therefore Summer Vapour limit value is 60 kPa. RON 95 fuel grade demonstrated non-compliant samples for the parameter.

Figure 21-3: Petrol analysis

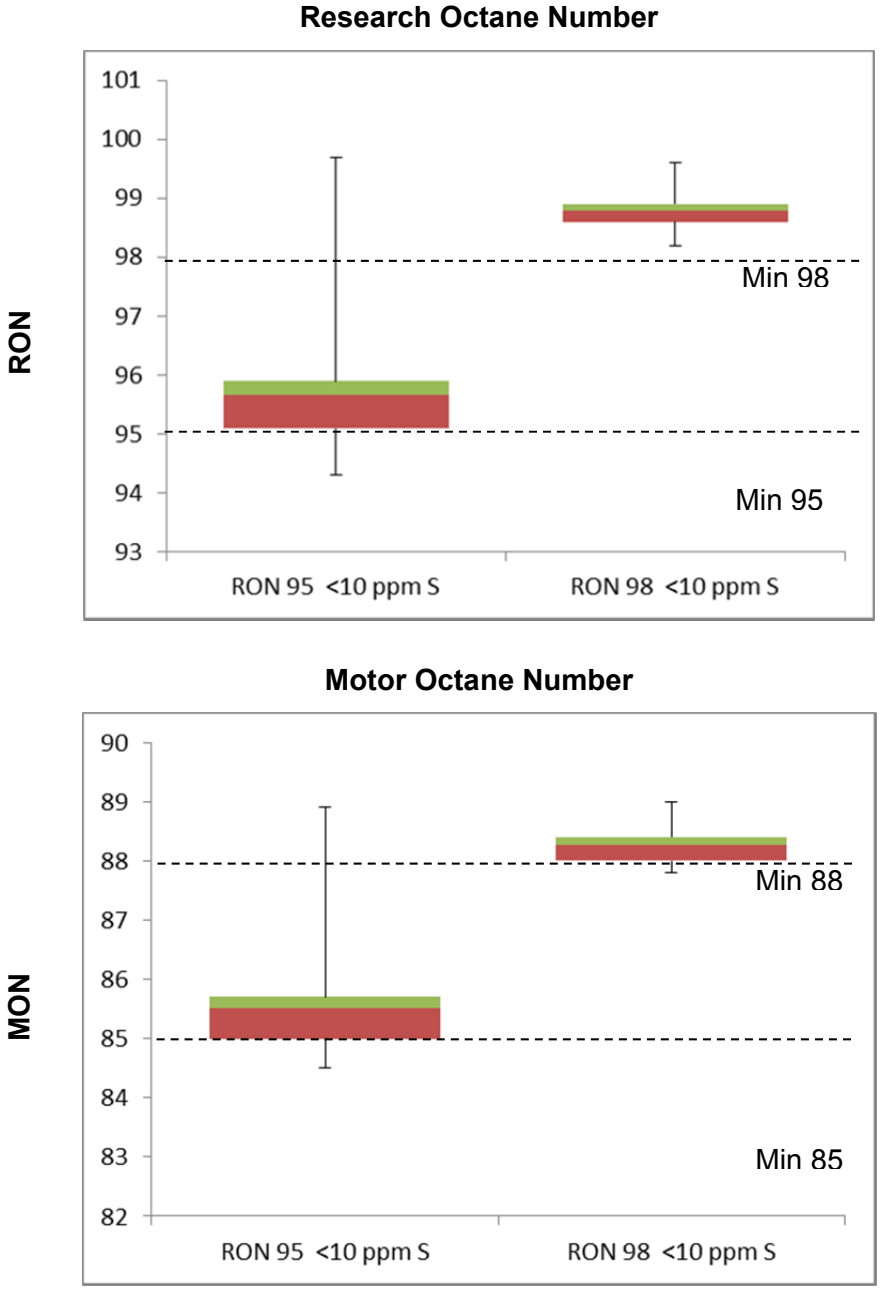
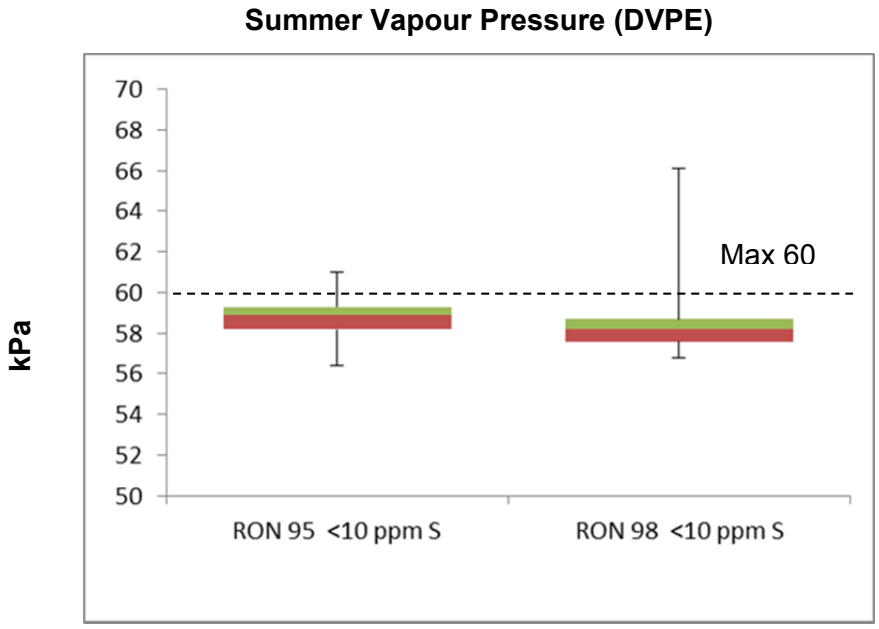


Figure 21-3: Petrol analysis (continued)



21.4.2 Diesel Analysis

Diesel sample results for Density and Distillation show a slightly wider variation in density, exhibited by the widely spread coloured bands at the 25 and 75 quartile – in comparison to the tight bands shown in the petrol analysis box plots. Both tests show some samples near compliance limits.

Figure 21-4: Diesel analysis

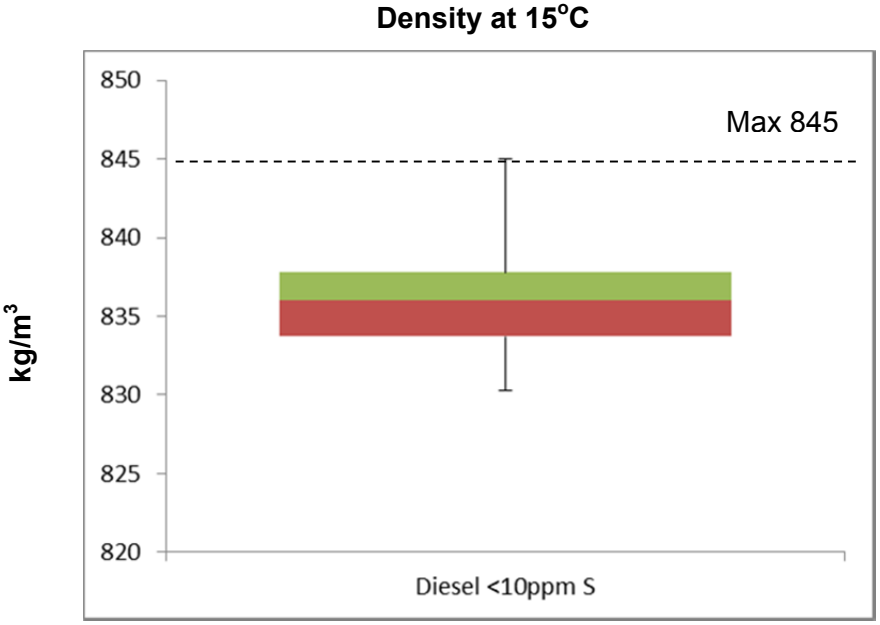
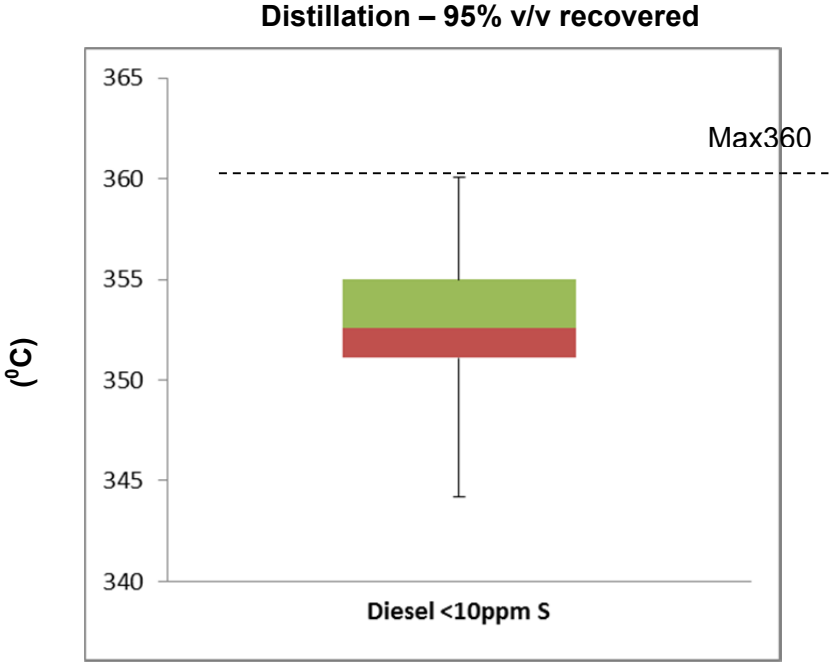


Figure 21-4: Diesel analysis (continued)



21.5 Key Areas for Improvement

The following table summarises the main areas in which improvements could be made to the monitoring system, reporting or compliance with Directive limit values. The table includes key recommendations from the previous year to give an assessment of what action has been taken by the Member State to address any issues that may have been highlighted.

Key Areas for Improvement (3 years)		
	Monitoring	**Reporting**
2012	• Too few samples were taken for all fuel grades, which may be improved. • Manganese in petrol fuel grades is recommended to be reported upon.	The report was received on the 25th June, before the deadline of the 30th June.
2011	• Luxembourg have not broken sampling down by region and therefore to demonstrate equivalence with models outlined in EN 14274 a minimum of 50 samples should be taken per summer and winter period for all fuel grades that exceed 10% market share. Too few samples have been taken in 2011. • Luxembourg did not report parameter results for Manganese in petrol fuel grades for RON 98 in 2011.	The Luxembourg report contains some inconsistent data – which has had to be queried with the Member State to ensure accuracy of reporting and analysis. Full details of the Luxembourg monitoring system have been reported to the Commission previously – however details have not been provided for the purposes of this monitoring report which hinders an assessment of compliance.

Key Areas for Improvement (3 years)		
	Monitoring	**Reporting**
2010	• Not enough sampling done in winter summer periods to meet minimum requirements. • No breakdown of sales by region.	Report was not submitted by the deadline.

22 Malta

22.1 Fuel Availability 2012

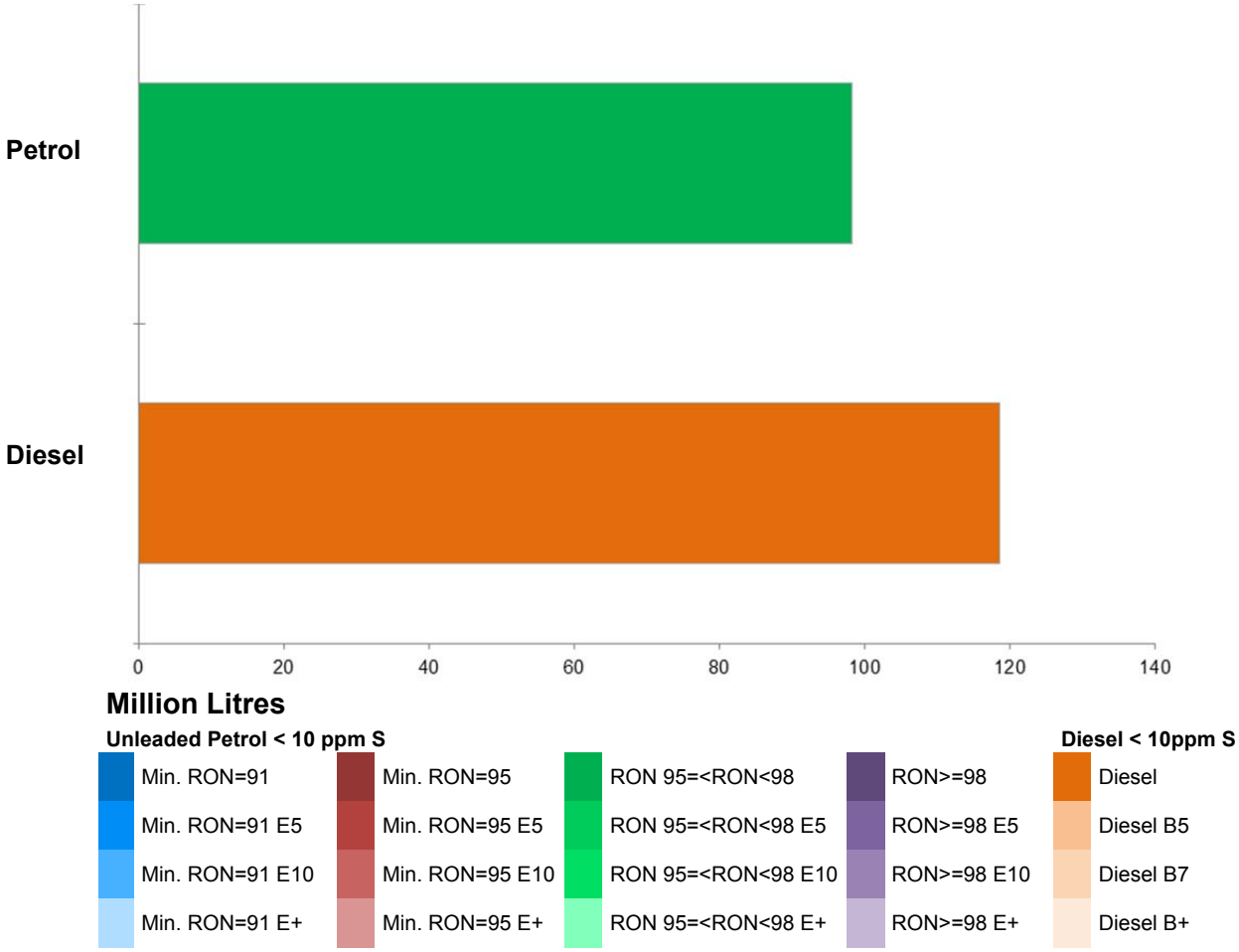
The following table lists the fuels that were reported to be available nationally in 2012.

Table 22-1: National fuel grade

Fuel grade	National fuel grade
Unleaded petrol (minimum 95 =< RON < 98)	EN 228
Diesel fuel	EN 590

22.1.1 Sales, sampling and reporting

Figure 22-1: Fuel Sales proportions by fuel type



Fuel sales in Malta were split relatively evenly between diesel and petrol fuel sales. In 2012, 119 million litres of diesel was sold in comparison to 98 million litres petrol fuel sales. Petrol fuel sales were comprised only of fuel grade RON 95=<RON<98 and no petrol fuels on the market in Malta in 2012 were reported to have biofuel content, although it should be noted that diesel contained biodiesel in the range of 0.0 % to 7.0%.

Table 22-2: Fuel sales and sampling

Fuel type (Parent Grade)	Sales (Million litres)	Sales % total of fuel type	Samples (1) S	Samples (1) W	Samples (1) TR (2)	Separate S/W(3)	Parameters measured (4)	Add. Notes
Unleaded petrol 95=<RON<98 (<10 ppm S)	98	100.00%	19	17	(50)	Yes	19 of 19	
Total Petrol	**98**	**100.00%**	**19**	**17**	**(50)**	**Yes**	**19 of 19**	
Diesel (<10 ppm sulphur)	119	100.00%	17	20	(50)	Yes	6 of 6	(a)
Total Diesel	**119**	**100.00%**	**17**	**20**	**(50)**	**Yes**	**6 of 6**	

(1)	Samples	The actual number of samples taken by the Member State in the summer (s) and winter (w) periods
(2)	TR	Total requirement per summer and winter period according to EN 14274. Brackets () show where a national model is being used, and the requirement is indicative to demonstrate equivalence with EN14274.
(3)	Separate S & W?	Yes indicates separate summer & winter reporting, and No indicates full year sample results reporting only.
(4)	Parameters measured	Currently 19 petrol parameters should be tested and reported by the Member States and 6 diesel parameters.
(a)	Add. Notes	Malta has reported Cetane Index rather than Cetane Number.
	Additional Information	Malta currently reports the number of samples for petrol and diesel as indicated in the Twinning Report mentioned in section 22.2.1.

22.1.1.1 Petrol Samples

Although Malta use a national system, and as such have no minimum sampling requirements they should undertake equivalent sampling to the EN 14274 recommended statistical models. As a small country with low fuel sales, Malta should report 50 samples per fuel grade, per period in order to demonstrate equivalence with EN 14274 requirements.

22.1.1.2 Diesel Samples

The number of samples taken by Malta is low. As above, diesel fuels should be sampled 50 times in each summer and winter period in order to demonstrate equivalence with EN 14274.

22.2 Fuel Quality Monitoring 2012

22.2.1 Description of System

Responsible organisation(s)	Malta Resources Authority (MRA)
Fuel Quality Monitoring System (FQMS)	National System
Country Size	Small
Summer Period	Normal
Location(s) of sampling	Petroleum Filling Stations
Time/frequency of sampling	Samples for petrol and diesel are taken throughout the year.

Specification of test methods	Malta reports according to test methods EN 228 for petrol and EN 590 for diesel fuels. Malta reports Cetane number instead of the Cetane index. During the design and implementation, the small size of fuel and throughput of fuel have been taken into consideration. This is coupled with the small number of petrol stations (around 80) on the archipelago. This National System was established by the Mission Report of the Twinning Project between Germany and Malta entitled: *Strengthening the capacity of the MRA in the implementation of the liberalisation of the petroleum market* with reference number MT2006-IB-OT-07 TL (07.9262.2-002.00) in 2009.
Collection of sales data	The data on fuel sold inland is extracted from the monthly oil balance reports submitted to the National Statistics Office and as required by the Eurostat. This monthly report consists of aggregated data on the importation, stock position and sales carried out by each of the authorized importers/wholesalers during the particular month. This individual data is subsequently aggregated and validated using a number of verification checks.

Other details

Malta will keep using the National System. There were no derogations received since the last detailed FQMS report except that this is the last year that Malta will be reporting the Cetane index instead of Cetane number. As from next year the Cetane number will be reported from the Market samples lifted. There were no changes to sampling quantities or location. Since April 2012, Manganese was included in the testing of all petrol fuel. Now all the petrol parameters are being measured.

22.2.2 Fuel Quality Monitoring System

22.2.2.1 Sampling

The organisation responsible for sampling and reporting is the MRA. Analysis is carried out by a local laboratory which is independent and commissioned by the MRA.

Sampling is carried out at refuelling stations only (there are no refineries in Malta). However import certificates are also requested from the supplier and these are included in the report. The frequency of sampling is distributed evenly throughout the year. The selection of sampling points is by random sampling and based on the places where fuel is dispensed to vehicles.

The sample size is representative of the population of dispensing sites at the 95 % confidence level as established in Annex Section A.2 of EN 14274:2013. The test methods used to sample the different parameters are as requested in the Directive or proven to be exactly equivalent to the standard quoted in this template.

22.2.2.2 FQMS administration

The Malta Resources Authority has the responsibility for managing and implementing the FQM Directive.

MRA's Compliance Officers lift samples from the petroleum filling stations. The annual data includes the Fuel Quality Certificates from the suppliers. This annual data required is usually provided by the Importers within the first 60 days of the following (new) year. The MRA is responsible for taking action when non-compliant samples have been discovered. The MRA has a procedure in place so that all non-compliances are investigated and acted upon well. The Police Force assists the MRA in the investigations and in Court.

During the design and implementation, the small size of fuel and throughput of fuel have been taken into consideration. This is coupled with the small number of petrol stations (around 80) on the archipelago. This National System was established by the Mission Report of the Twinning Project between Germany and Malta entitled: Strengthening the capacity of the MRA in the implementation of the liberalisation of the petroleum market with reference number MT2006-IB-OT-07 TL (07.9262.2-002.00) in 2009.

There are no national refineries and two distribution terminals.

22.2.2.3 National Legislation that transposed the FQD

The Quality of fuels in Malta is regulated through the Quality of Fuels Regulations, LN 44 of 2008 as amended.

This regulation reflects the Articles of Directive 98/70/EC and 1999/32/EC, as respectively amended. These regulations specify:

- the environmental specifications of petrol and diesel,
- the sulphur content of gas oil and fuel oil and,
- the sulphur content and sampling procedures in the marine fuel sector.

22.2.2.4 Reporting periods

Malta uses Normal seasonal periods. Samples are occasionally lifted and tested also during the transition period. Samples taken during the transition period are reported within the annual fuel quality report and a reason of seasonality is given if there is a non-conformance. This fuel is usually used up within two weeks of the changeover dates.

22.2.3 Compliance with Fuel Quality Limit Values

Table 22-3: Petrol Fuel Grades

Unleaded Petrol RON 95 ≤ RON <98(EN 228)- Details of samples that exceed tolerance limits:					
Parameter	**Limit Value**	**Tolerance Limit* (TL)**	**Max/Min value of samples tested**	**No samples outside TL**	**% samples outside TL**
Summer vapour pressure, kPa	60	61.8	75.1	2	10.53%
Aromatics	35	37.2	36.5	2	5.56%
Member State notes For Summer vapour pressure: The unleaded fuel sampled was from the winter period since that particular station had not yet exhausted its last winter consignment. For Aromatics: No action was taken; One value exceeds tolerance limit by 0.5					

Table 22-4: Diesel Fuel Grades

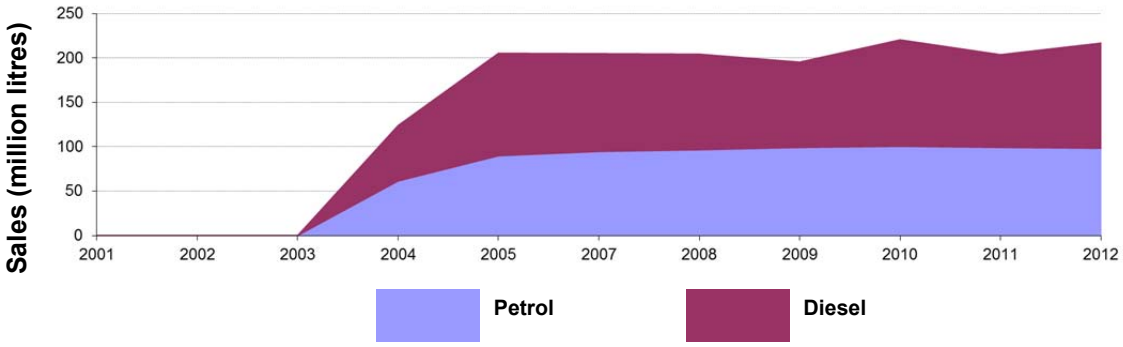
Diesel - Details of samples that exceed tolerance limits:					
Parameter	**Limit Value**	**Tolerance Limit* (TL)**	**Max/Min value of samples tested**	**No samples outside TL**	**% samples outside TL**
Density at 15°C	845	845.7	847	3	0.36%
Polycyclic aromatic hydrocarbons	11	12.1	10	2	5.41%
Sulphur content (mg/kg)	10	11.2	11	1	2.70%
FAME content	7	7.3	11	2	5.41%
Member State notes For Density at 15°C, Polycyclic aromatic hydrocarbons and FAME content: Legal Action was taken. For Sulphur content: within tolerance limits					

22.3 Temporal Trends

Figure 22-2 shows the trend in total fuel sales since 2004. Diesel fuel sales have reduced by 13% from 120 million litres to 105 million litres in the period 2010 to 2011. Petrol fuel sales have fallen by only 1% from 100 million litres to 99 million litres in the same period. However, overall, fuel sales remain 40% (diesel) and 38.1% (petrol) greater than first reported in 2004.

Please note that although there is not a report for Malta for 2006, official figures of sales for petrol and diesel in 2006 are 83,673,354 million litres for petrol (18,399,023 for LRP and 65,274,331 for Unleaded) and 84,292,796 million litres for diesel.

Figure 22-2: Temporal trends in national sales of petrol and diesel (million litres)



22.4 Statistical Analysis

The following charts in this section are known as box-plots and they display the distribution of fuel characteristics per Member State by illustrating the:

- Sample minimum
- Lower 25% range
- Middle 50% range
- Median

- Upper 25% range
- Maximum

For a full explanation of the information presented in a Box Plot diagram, please see Section 4.

Fuel sampling in Malta in 2012 recorded relatively few test results out of specification with limits – however low sample figures mean that these non-compliances formed 5.6% of petrol sampling and 1% diesel sampling – which is proportionally high. The analysis charts for petrol (Figure 22-3) and diesel (Figure 22-4) detail the distribution of sample results for the 5 selected parameters;

Petrol:

- Research Octane Number
- Motor Octane Number
- Summer Vapour Pressure

Diesel:

- Density at 15^{o}C
- Distillation – 95% v/v recovered

Sample results for these parameters have been depicted using box plots based on the reported sample minimum, lower quartile (Q1), median (Q2), upper quartile (Q3), and the maximum sample value.

22.4.1 Petrol Analysis

Sample results show that even with relatively small sample number the RON, MON and Summer Vapour pressure results show little variance. RON has no samples that have exceeded tolerance limits whilst both MON and Summer vapour have samples close to tolerance limits (samples that have exceed Summer vapour pressure have been justified).

Figure 22-3: Petrol analysis

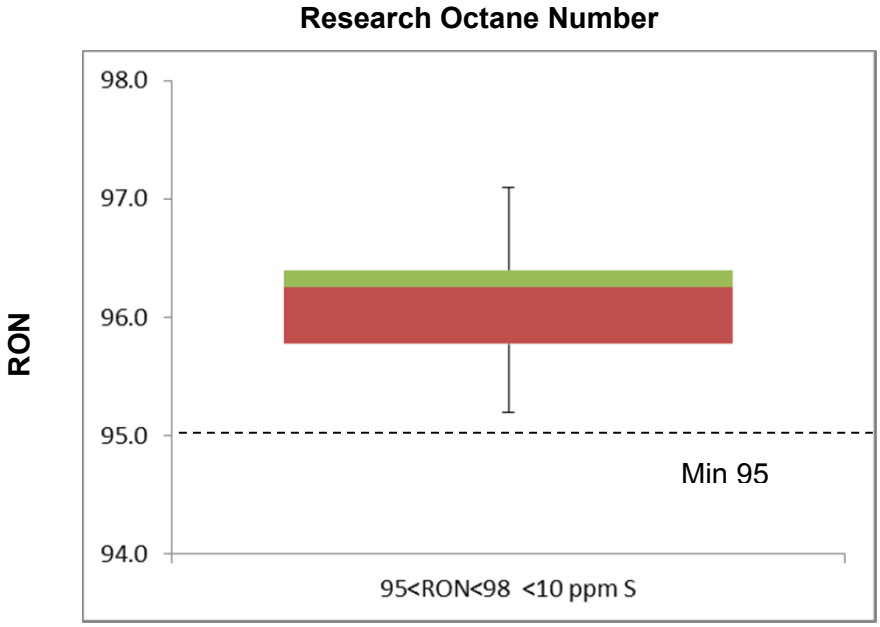
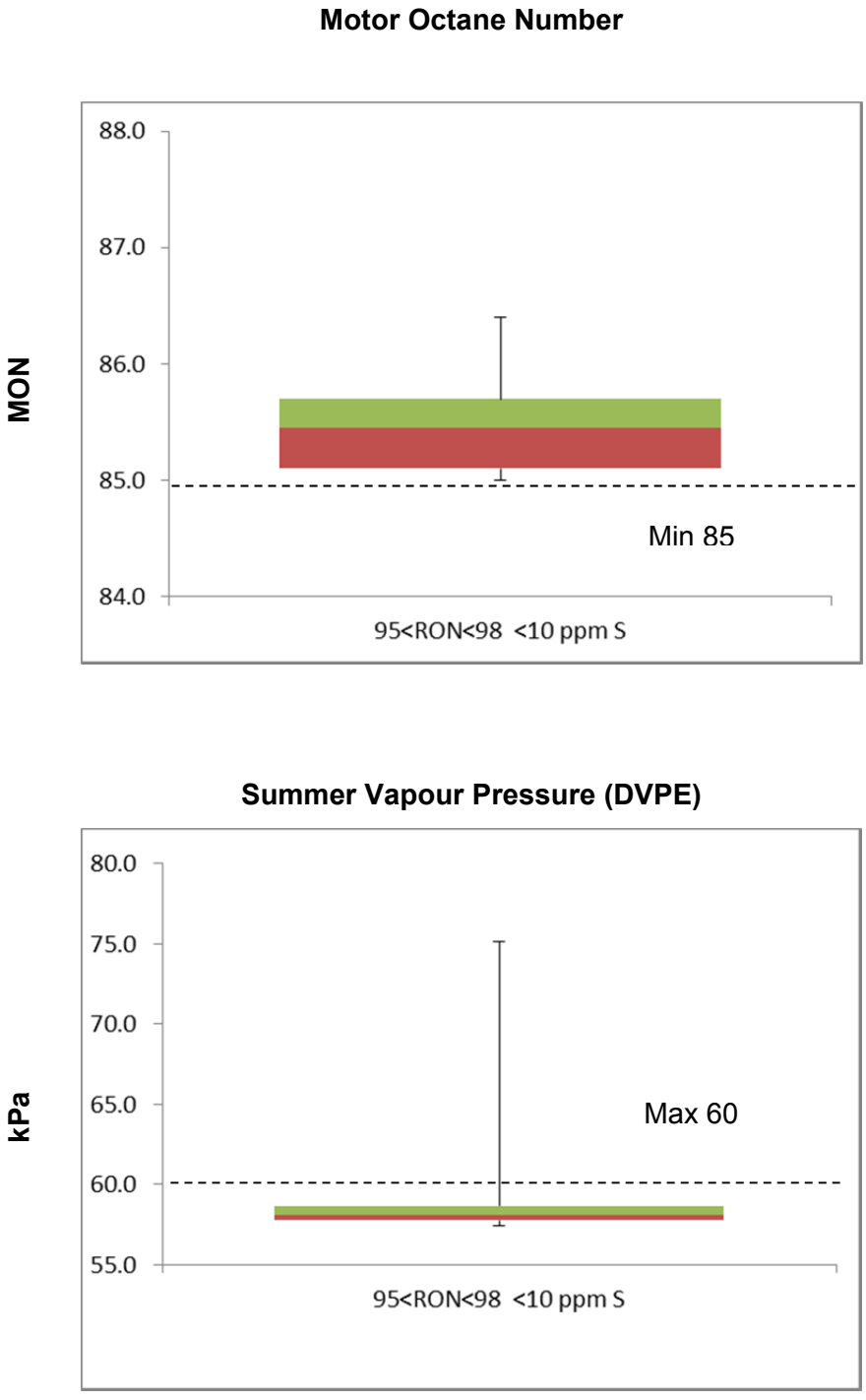


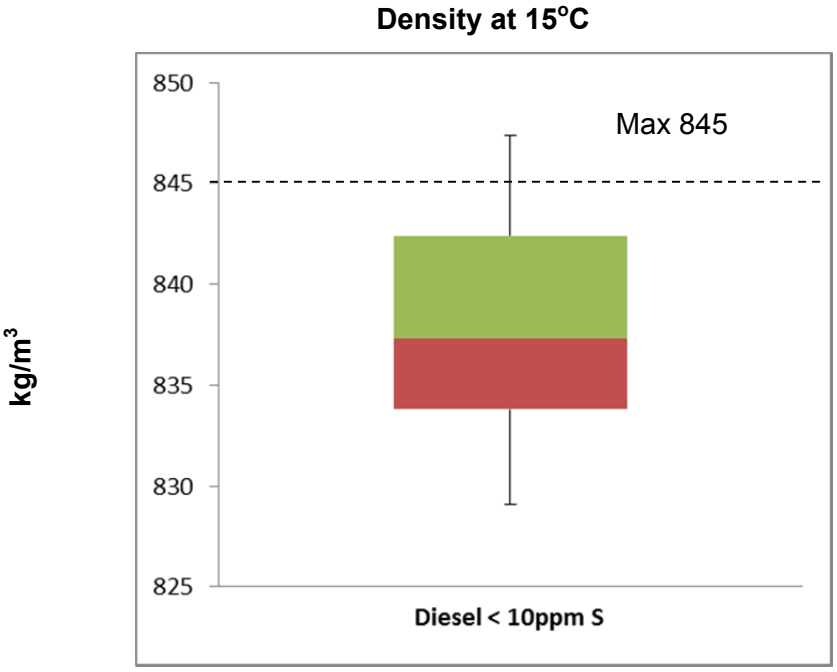
Figure 21-3: Petrol analysis (continued)

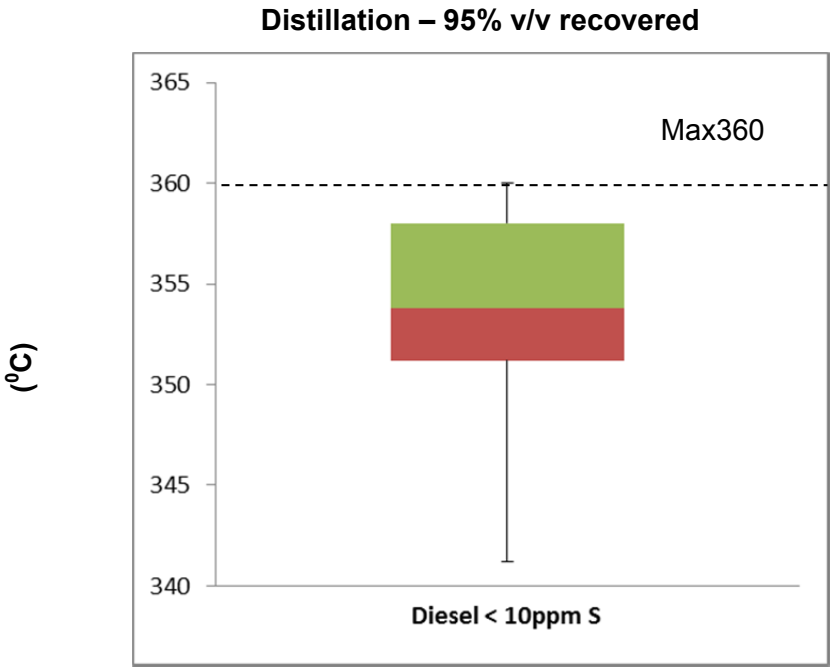


22.4.2 Diesel Analysis

Diesel sample results for Density and Distillation show a slightly wider variation in density, exhibited by the widely spread coloured bands at the 25 and 75 quartile – in comparison to the tight bands shown in the petrol analysis box plots. Density shows samples exceeding tolerance limits whilst samples are very close to tolerance for distillation.

Figure 22-4: Diesel analysis





22.5 Key Areas for Improvement

The following table summarises the main areas in which improvements could be made to the monitoring system, reporting or compliance with Directive limit values. The table includes key recommendations from the previous year to give an assessment of what action has been taken by the Member State to address any issues that may have been highlighted.

Key Areas for Improvement (3 years)		
	Monitoring	**Reporting**
2012	• Very low sample quantities do not demonstrate equivalence with statistical models detailed in EN 14274. Malta has advised that the Mission Report entitled FQMS Activity A4 under the Twinning Light Project: Strengthening the Capacity of the MRA in the implementation of the liberalisation of the petroleum Market REF MT 2006-IB-OT-07 TL (07.9262.2-002.00) demonstrates Malta's equivalence with EN 14274. • These small sample size reflect badly on the non-compliances, which are high in comparison to sample size. • Malta have reported cetane index – not Cetane Number again in 2012. Malta has advised that this is due to no laboratories in Malta offering the service to test for Cetane number and thus a Cetane index according to EN 590 is reported.	• The report was received early on the 14 June, in the correct format.
2011	• Very low sample quantities do not demonstrate equivalence with statistical models detailed in EN 14274. Malta has advised that the Mission Report entitled FQMS Activity A4 under the Twinning Light Project: Strengthening the Capacity of the MRA in the implementation of the liberalisation of the petroleum Market REF MT 2006-IB-OT-07 TL (07.9262.2-002.00) demonstrates Malta's equivalence with EN 14274. • All non-compliant samples found at fuel dispensing sites (service stations) which could indicate contamination in the supply chain. • Malta have reported cetane index – not Cetane Number again in 2011. Malta has advised that this is due to no laboratories in Malta offering the service to test for Cetane number	• Report was received before the 30th June submission deadline and was received in the updated 2011 reporting format.

Key Areas for Improvement (3 years)		
	Monitoring	**Reporting**
	and thus a Cetane index according to EN 590 is reported. • Malta did not report parameter results for Manganese for petrol fuel grades in 2011.	
2010	• Have done a very small amount of sampling on all fuel grades • Have reported Cetane Index and not Cetane number	• No comment.

23 Netherlands

23.1 Fuel Availability 2012

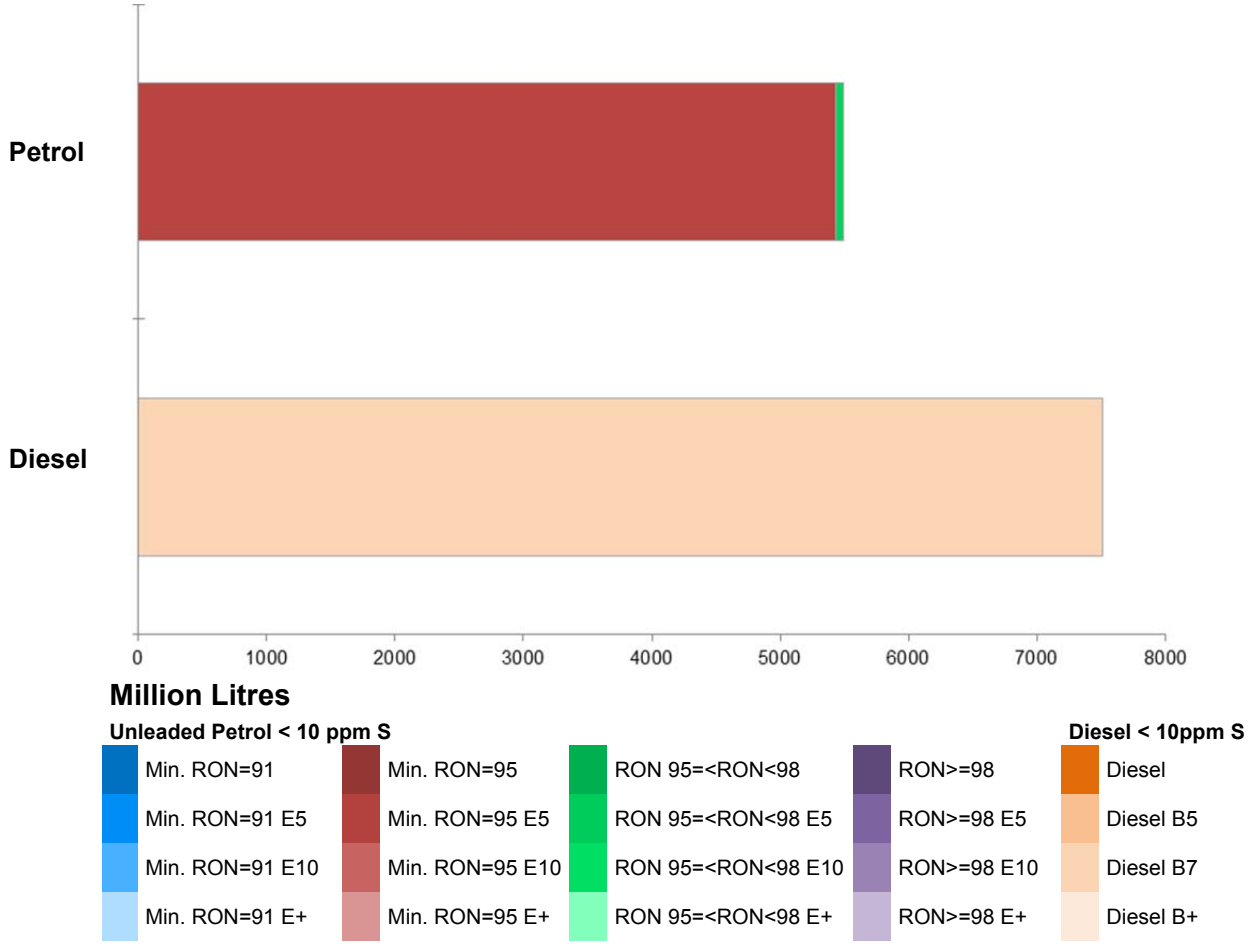
The following table lists the fuels that were reported to be available nationally in 2012.

Table 23-1: National fuel grade

Fuel grade	National fuel grade
Unleaded petrol (minimum RON = 95)	Euro 95
Unleaded petrol (minimum 95 =< RON < 98)	Super plus
Diesel fuel	Diesel

23.1.1 Sales, sampling and reporting

Figure 23-1: Fuel Sales proportions by fuel type



During 2012 fuel sales in The Netherlands were predominately led by diesel fuel sales. Petrol fuel sales were weighted heavily towards Euro 95 (RON 95) fuel sales with only 1.1% of Super Plus (min 95 =< RON < 98) fuel sales.

Table 23-2: Fuel sales and sampling

Fuel type (Parent Grade)	Sales (Million litres)	Sales % total of fuel type	Samples (1) S	Samples (1) W	Samples (1) TR (2)	Separate S/W(3)	Parameters measured (4)	Add. Notes
Unleaded petrol min. RON=95 (<10 ppm S)	5,436	98.93%	0	50	(50)	Yes	17 of 19	(a)
Unleaded petrol 95=<RON<98 (<10 ppm S)	59	1.07%	0	0	(1)	No	None	
Total Petrol	**5,495**	**100.00%**	**0**	**50**	**(51)**			
Diesel (<10 ppm sulphur)	7,512	100.00%	0	50	(50)	Yes	6 of 6	
Total Diesel	**7,512**	**100.00%**	**0**	**50**	**(50)**	**Yes**	**6 of 6**	

(1)	Samples	The actual number of samples taken by the Member State in the summer (s) and winter (w) periods
(2)	TR	Total requirement per summer and winter period according to EN 14274. Brackets () show where a national model is being used, and the requirement is indicative to demonstrate equivalence with EN14274.
(3)	Separate S & W?	Yes indicates separate summer & winter reporting, and No indicates full year sample results reporting only.
(4)	Parameters measured	Currently 19 petrol parameters should be tested and reported by the Member States and 6 diesel parameters.
(a)	Additional notes	Parameters Manganese and vapour pressure were not sampled for petrol and diesel tests respectively.
	Additional Information:	The Netherlands has 12 provinces. It was decided to take samples at fuel service stations from various oil companies. Samples have been taken in each province at bases of the population and the number of fuel stations of each province. This had been resulted in a total of 100 checks divide between summer and winter.

23.1.1.1 Petrol Samples

- The Netherlands have not taken any samples of fuel grade Euro Super. This fuel grade represents less than 10% share of the market – however fuels with a less than 10% share should be sampled in reduced quantities according to EN 14274. In this instance, with a 1.07% share of the market, samples should have totalled 2 for the full year.
- Samples for Euro 95 have not complied with minimum sampling requirements for 2012.

23.1.1.2 Diesel Samples

- Diesel fuel samples tested in 2012 have not complied with the total minimum requirement.

23.2 Fuel Quality Monitoring 2012

23.2.1 Description of System

Responsible organisation(s)	Human Environment and Transport Inspectorate, Hazardous Substances and Products
Fuel Quality Monitoring System (FQMS)	National System.
Country Size	Small
Summer Period	Normal
Location(s) of sampling	Service stations
Time/frequency of sampling	Both petrol and diesel samples have been taken in only 4 months of the year; May and June during the summer period and November and December of the winter period. No samples have been taken or tested for petrol fuel grade Super Plus.
Specification of test methods	No information has been provided about test methods.
Collection of sales data	The source of sales data for 2012 has not been provided.

Other details: Biofuels are only available for consumers as a component in the regular petrol and gasoil.

No samples have been taken or tested for petrol fuel grade Super Plus (Unleaded petrol (minimum 95 =< RON < 98)) which comprises 1.07% market petrol share.

23.2.2 Compliance with Fuel Quality Limit Values

Table 23-3: Petrol Fuel Grades

Petrol - Details of samples that exceed tolerance limits:
No samples found to be out of compliance with Directive specifications.

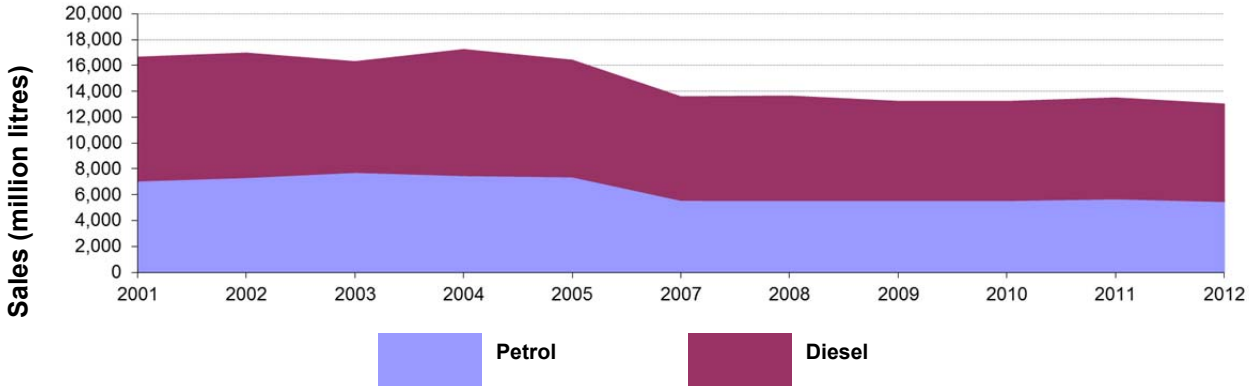
Table 23-4: Diesel Fuel Grades

Diesel - Details of samples that exceed tolerance limits:					
Parameter	**Limit Value**	**Tolerance Limit* (TL)**	**Max/Min value of samples tested**	**No samples outside TL**	**% samples outside TL**
FAME	7.0	7.3	8.7	1	2%
At least one sample exceeded FAME content in 2012.					

23.3 Temporal Trends

Figure 23-2 shows the trend in total fuel sales in the Netherlands from 2001. For the fourth year running, sales of both petrol and diesel have remained roughly constant.

Figure 23-2: Temporal trends in national sales of petrol and diesel (million litres)



23.4 Statistical Analysis

From 2010 the Commission have requested that Member States provide some additional information to enable further statistical analysis of fuel quality reported by Member States. In order to carry out further analysis, the Member States have been asked to provide the following details for each parameter;

- Sample minimum
- Lower 25% range (from 2010)
- Middle 50% range
- Median (from 2009)
- Upper 25% range (from 2010)
- Maximum

This information is then used to generate box diagrams which can help to display fuel conditions within individual Member States – and in comparison to other Member States within EU-wide summary sections of this report). For a full explanation of the information presented in a Box Plot diagram, please see section 4.

Parameters selected by the Commission for further analysis were;

Petrol:

- Research Octane Number
- Motor Octane Number
- Summer Vapour Pressure

Diesel:

- Density at 15^{o}C
- Distillation – 95% v/v recovered

However, the Netherlands has not provided the additional information and so it has not been possible to include the statistical analysis, below.

23.4.1 Petrol and Diesel Analysis

Fuel sampling in The Netherlands in 2012 recorded no test results out of specification with tolerance limits. The Netherlands has not provided the additional detail requested for 2012 reporting to enable further analysis.

23.5 Key Areas for Improvement

The following table summarises the main areas in which improvements could be made to the monitoring system, reporting or compliance with Directive limit values. The table includes key recommendations from the previous year to give an assessment of what action has been taken by the Member State to address any issues that may have been highlighted.

Key Areas for Improvement (3 years)		
Year	**Monitoring**	**Reporting**
2012	• The Netherlands only collected samples during winter period in 2012 • The Netherlands did not complete the statistical results section of the template and hence no statistical analysis charts for petrol or diesel are available to detail the distribution of sample results for the selected parameters. While this reporting element is not mandatory, additional information was requested by the Commission in order to enhance comparability and assessment of EU-wide FQM results. • The Netherlands were asked to confirm the National sales total amounts, however no further information has been provided. • The Netherlands have not taken any samples of fuel grade Euro Super. This fuel grade represents less than 10% share of the market – however fuels with a less than 10% share should be sampled in reduced quantities according to EN 14274. In this instance, with a 1.2% share of the market, samples should have totalled 2 for the full year.	The 2012 report was submitted on 2nd July just after the legal deadline 30th June.
2011	• The Netherlands did not complete the statistical results section of the template and hence no statistical analysis charts for petrol or diesel are available to detail the distribution of sample results for the selected parameters. While this reporting element is not mandatory, additional information was requested by the Commission in order to enhance comparability and assessment of EU-wide FQM results. • The Netherlands were asked to	The 2011 report was submitted within Member State deadline. The specification of test methods has not been provided for 2011. The collection source of sales data for 2011 has not been provided.

Key Areas for Improvement (3 years)		
Year	**Monitoring**	**Reporting**
	confirm the National sales total amounts, however no further information has been provided. • The Netherlands have not taken any samples of fuel grade Euro Super. This fuel grade represents less than 10% share of the market – however fuels with a less than 10% share should be sampled in reduced quantities according to EN 14274. In this instance, with a 1.2% share of the market, samples should have totalled 2 for the full year. • The Netherlands did not report parameter results for Manganese for petrol fuel grades or FAME content for diesel fuel grades in 2011.	
2010	• RON 98 (1.3% of petrol sales) was not sampled and tested at all. • The number of non-compliant samples has not been detailed within the report – additionally no information has been provided about actions taken to address instances of non-compliance.	• Report not in EC template. • Report submitted extremely late (in November 2011; more than 4 months late) • Additional data requested by the Commission for 2010 has not been provided. • Test methods used in 2010 have not been confirmed. • The source of sales data has not been confirmed. • Summer, winter and full year reported data does not correspond (e.g. maximum values in summer or winter period not accounted for in Full Year reporting sheets).

24 Poland

24.1 Fuel Availability 2012

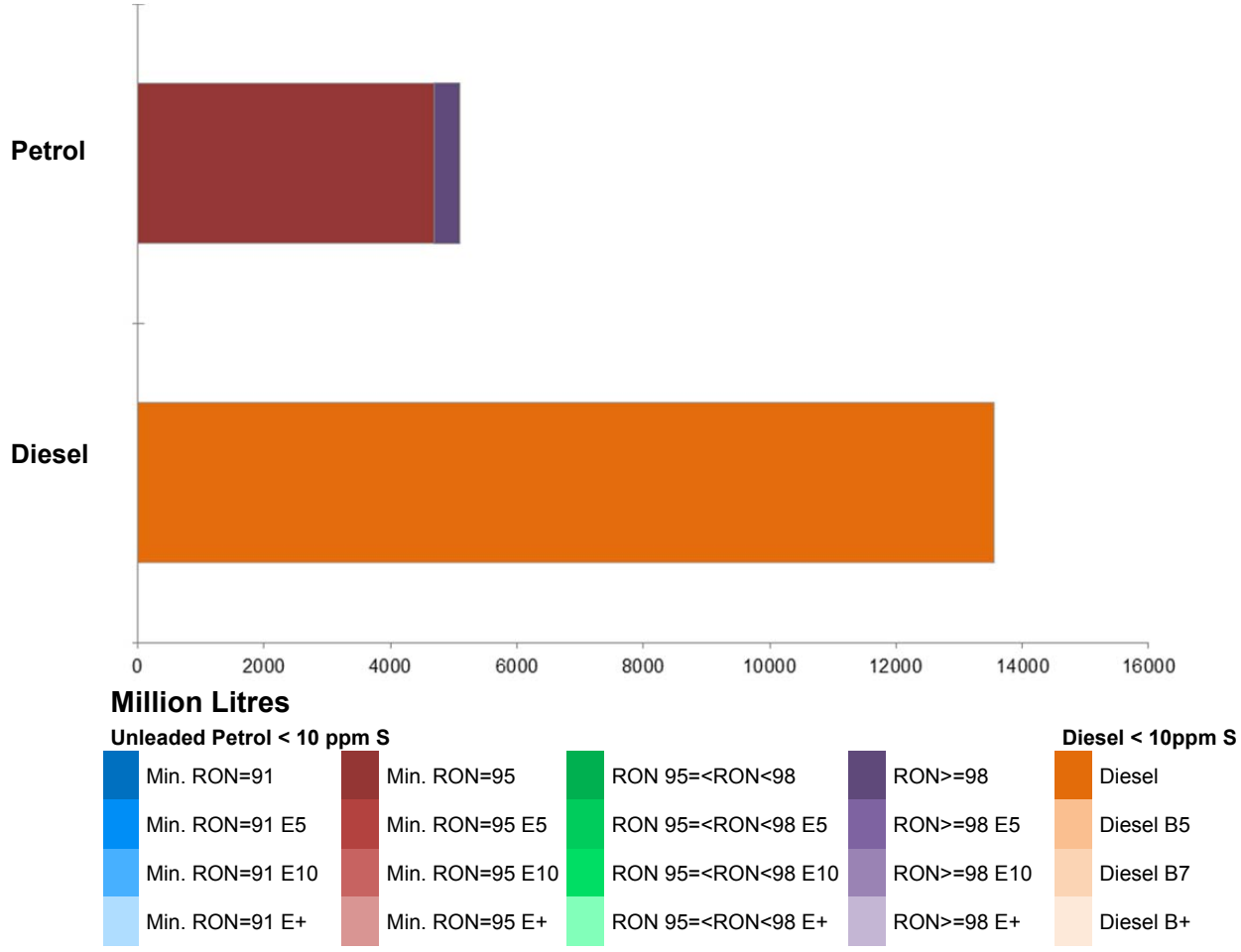
The following table lists the fuels that were reported to be available nationally in 2012.

Table 24-1: National fuel grade

Fuel grade	National fuel grade
Unleaded petrol (minimum RON = 95)	RON 95
Unleaded petrol (minimum RON>=98)	RON 98
Diesel fuel	Diesel

24.1.1 Sales, sampling and reporting

Figure 24-1: Fuel Sales proportions by fuel type



During 2012 fuel sales in Poland were dominated by diesel fuel sales. More than 13,555 million litres of diesel was sold in comparison to 5,102 million litres of petrol (all petrol grades combined). Petrol fuel sales were mainly comprised (92%) of fuel grade RON 95.

Table 24-2: Fuel sales and sampling

Fuel type (Parent Grade)	Sales (Million litres)	Sales % total of fuel type	Samples (1) S	Samples (1) W	Samples (1) TR (2)	Separate S/W(3)	Parameters measured (4)	Add. Notes
Unleaded petrol min. RON=95 (<10 ppm S)	4,690	91.93%	103	104	200	Yes	18 of 19	(a)
Unleaded petrol RON>=98 (<10 ppm S)	412	8.07%	36	36	17	Yes	18 of 19	(a)
Total Petrol	**5,102**	**100.00%**	**139**	**140**	**217**	**Yes**	**18 of 19**	
Diesel (<10 ppm sulphur)	13,555	100.00%	101	103	200	Yes	6 of 6	
Total Diesel	**13,555**	**100.00%**	**101**	**103**	**200**	**Yes**	**6 of 6**	

(1)	Samples	The actual number of samples taken by the Member State in the summer (s) and winter (w) periods
(2)	TR	Total requirement per summer and winter period according to EN 14274. Brackets () show where a national model is being used, and the requirement is indicative to demonstrate equivalence with EN14274.
(3)	Separate S & W?	Yes indicates separate summer & winter reporting, and No indicates full year sample results reporting only.
(4)	Parameters measured	Currently 19 petrol parameters should be tested and reported by the Member States and 6 diesel parameters.
(a)	Additional Notes	Petrol fuel sample testing did not include Manganese content in 2012.

24.1.1.1 Petrol Samples

Poland has reported as a small country, and fulfils the sampling requirements of 100 samples per grade for RON 95. However, according to EN14274, a small country should have annual fuel sales of less than 15 million litres. Poland's fuel sales in 2012 were over 18 million litres, indicating that Poland should report as a large country. In 2012, Poland did not fulfil the minimum sampling requirement for a large country (200 samples per grade in Summer and Winter) for RON 95.

According to EN14274, fuel grades that constitute less than 10% of the total market share (for petrol and diesel separately) require a lower number of samples. The number of samples is calculated as a proportion of the number of samples required in the parent fuel grade. Using the sales data provided in the 2012 submission, sales of RON 98 were less than 10% of the total petrol market; therefore only 8 samples were required to comply with the Directive (16 if Poland is classified as a large country). Poland exceeded this requirement, reporting 36 samples in both the Summer and Winter periods.

24.1.1.2 Diesel Samples

Poland has reported as a small country, and fulfils the sampling requirements of 100 samples per grade for diesel. However, according to EN14274, a small country should have annual fuel sales of less than 15 million litres. Poland's fuel sales in 2012 were over 18 million litres, indicating that Poland should report as a large country. In 2012, Poland did not fulfil the minimum sampling requirement for a large country (200 samples per grade in Summer and Winter) for Diesel.

24.2 Fuel Quality Monitoring 2012

24.2.1 Description of System

Responsible organisation(s)	Office of Competition and Consumer protection
Fuel Quality Monitoring System (FQMS)	EN 14274 Statistical model B
Country Size	Large (small, as reported by Poland)
Summer Period	Normal (e.g. ambient summer temperature) Summer Period Start: 1st May - End: 30th September Winter Period Start: 1st October - End: 30th April
Location(s) of sampling	Service stations
Time/frequency of sampling	Samples have been taken and tested for 12 months of the year.
Specification of test methods	As per Directive 98/70/EC - Poland uses the EN 14274 norm for the interpretation of the analyses.
Collection of sales data	Collection of sales data was provided by The Energy Regulatory Office and the Energy Market Agency (Urząd Regulacji Energetyki oraz Agencję Rynku Energii S.A.) for 2012.

Other details

The tasks associated with the administration of the system are carried out by the Trade Inspection, which carries out inspections of fuel quality. Poland adopted a fuel quality monitoring system defined in the standard EN 14 274 Automotive fuels - Assessment of petrol and diesel - Fuel Quality Monitoring System (FQMS) - Model B - with special reference to the Polish.

In accordance with the Regulation on the monitoring, the minimum number of samples to monitor is 100 for each fuel type.

Due to the low level of sales of unleaded petrol RON 98, the minimum number of samples for this fuel type for each monitoring period is 30, not 100, as specified in EN 14 274.

24.2.2 Fuel Quality Monitoring System

24.2.2.1 Sampling

The president of the Office of Competition and Consumer Protection is responsible for the system monitoring and control of fuel quality management. The tasks associated with the administration of the system are carried out by the Trade Inspectorate, which carries out inspections of fuel quality. The analysis of fuel quality is conducted by laboratories accredited by the Polish Accreditation Centre, which reviews methods used. To so control activities, specifically in relation to information provided to the European Commission about the quality of fuels, the section of existing fuel quality work that relates to the FQM Directive is called "European part of the system for monitoring and controlling the quality of fuel", which relates to the control of:

• 98 RON unleaded petrol, unleaded petrol RON 95, diesel oil and ester forming pure fuel (B100).

• Liquid fuels such as diesel oil containing 20% acetic acid (B20) and ester forming pure fuel (B100).

• Fuel supplied by; Petrol stations and companies.

• The sampling of fuel to European EN 14 274 standard.

• All the quality parameters set out in the Directive on the quality of petrol and diesel fuels and some parameters of the so-called supplied list in the Regulation on quality requirements (listed in PN-EN 228 Automotive fuels - Unleaded petrol - Requirements and test methods, and EN 590 Automotive fuels - Diesel fuel - Requirements and test methods).

• All the quality parameters specified in the Regulation on quality requirements for biofuels (listed in the standard EN 14 214 Automotive fuels - Fatty acid methyl esters (FAME) for diesel engines - Requirements and test methods).

24.2.2.2 FQMS administration

President of the Office of Competition and Consumer Protection is responsible for the system monitoring and control of fuel quality management. The tasks associated with the administration of the system are carried out by the Trade Inspection, which carries out inspections of fuel quality. Poland adopted a fuel quality monitoring system defined in the standard EN 14 274 (Automotive fuels - Assessment of petrol and diesel) and Fuel Quality Monitoring System (FQMS) Model B, with special reference to the Polish.

In accordance with the Regulation on the monitoring, the minimum number of samples to monitor is 100 for each fuel type.

24.2.2.3 National Legislation that transposed the FQD

The legal basis for the functioning of the monitoring and controlling the quality of fuels in Poland are:

• Act of 25 August 2006 on the monitoring and control of fuel quality (Journal of Laws No. 169, item. 1200, as amended.) Herein after referred to as "the Act", carrying the provisions of Directive 98/70/EC of the European Parliament and of the Council of October 13, 1998 relating to the quality of petrol and diesel fuels and amending Council Directive 93/12/EC (OJ. Communities L 350 of 28.12.98, p.58; Acts. Gazette. Polish special edition, rust. 13, vol 23, p 182) as amended by Directive 2003/17/EC of the European Parliament and of the Council of 3 March 2003 (OJ. L 76, 22.3.2003, p 10, Coll. machines. Polish special edition, rust. 13, vol 31, p 160), and Directive 2009/30/EC of the European Parliament and of the Council of 23 April 2009 amending Directive 98/70/EC as regards the specification of petrol and diesel fuels and introducing a mechanism to monitor and reduce greenhouse gas emissions and amending Council Directive 1999/32/EC as regards the specification of fuel used by inland waterway vessels and repealing Directive 93/12/EEC (OJ. Union L 140 of 05.06.2009, p 88), hereinafter referred to as "the Directive",

• Act of 15 December 2000 on the Trade Inspection (Journal of Laws of 2009 No. 151, item. 1219, as amended.) And issued on the basis of implementing acts,

• Regulation of the Minister of Economy of 21 September 2007 concerning the methods of monitoring the quality of liquid fuels, liquid fuels, and design reports for these fuels and liquefied petroleum gas (LPG) and compressed natural gas (CNG) (Journal of Laws No. 189, pos. 1354), hereinafter "Regulation on the monitoring",

• Regulation of the Minister of Economy of 9 December 2008 on the quality requirements for liquid fuels (Journal of Laws No. 221, item. 1441, as amended.), Hereinafter "Regulation on quality requirements",

• Regulation of the Minister of Economy of 25 March 2010 on the methods of testing the quality of liquid fuels (Journal of Laws No. 55, item. 332), hereinafter "Regulation on the methods for testing the quality of liquid fuels",

• Regulation of the Minister of Economy of 22 January 2009 on the quality requirements for liquid biofuels (Journal of Laws No. 18, item. 98),

• Regulation of the Minister of Economy of 22 April 2010 on the methods of testing the quality of liquid biofuels (Journal of Laws No. 78, item. 520), hereinafter "Regulation on the methods for testing the quality of liquid fuels." The Act of 25 August 2006, transferred to the Polish legislation the provisions of the following Directives:

• 98/70/EC of the European Parliament and of the Council of 13 October 1998 the quality of petrol and diesel fuels and amending Council Directive 93/12/EC (OJ. L 350, 28.12.98, p.58), as amended by Directive 2003/17/EC of the European Parliament and of the Council of 3 March 2003 . (OJ. L 76, 22.3.2003, p 10)

• Council 1999/32/EC of 26 April 1999 relating to a reduction in the sulphur content of certain liquid fuels and amending Directive 93/12/EEC (OJ. L 121 11.05.1999, p 13).

• 2005/33/EC of the European Parliament and of the Council of 6 July 2005 amending Directive 1999/32/EC as regards the sulphur content of marine fuels (OJ. EU L 191, 22.07.2005, p 59).

• Directive 2009/30/EC of the European Parliament and of the Council of 23 April 2009 amending Directive 98/70/EC as regards the specification of petrol and diesel fuels and introducing a mechanism to monitor and reduce greenhouse gas emissions and amending Council Directive 1999/32 / EC as regards the specification of fuel used by inland waterway vessels and repealing Directive 93/12/EEC (OJ. EU L 140, 05.06.2009, p 88). Directive 2009/30/EC has been partially transposed into Polish law by the Law of 27 May 2011 amending the law on monitoring and controlling the quality of fuel and other acts (Journal of Laws No. 153, item. 902). Currently, legislative work is leading towards full implementation of the above Directive.

24.2.2.4 Reporting periods

In accordance with the Regulation on the monitoring, monitoring and quality control of fuels have been divided into two periods of the year: summer and winter. The summer period, in relation to petrol, runs from May 1 to September 30 (in relation to diesel from April 16 to September 30). The winter period, in relation to petrol, lasts from October 1 to April 30 (with respect to diesel from 1 October to 15 April).

24.2.3 Compliance with Fuel Quality Limit Values

Table 24-3: Petrol Fuel Grades

Unleaded 95 - Details of samples that exceed tolerance limits:					
Parameter	**Limit Value**	**Tolerance Limit* (TL)**	**Max/Min value of samples tested**	**No samples outside TL**	**% samples outside TL**
Research Octane Number	95	94.3	93.5	1	0.48%
Motor Octane Number	85	84.5	83.8	1	0.48%
Summer vapour pressure, kPa	60	61.3	61.6	1	0.97
Aromatics, % (v/v)	35.0	36.0	38	2	1.15%
Methanol	3	3.2	3.8	1	0.48%
Sulphur content (mg/kg)	10	11.8	16.9	1	0.48%

Member State notes
For samples outside of tolerance limits a notification was sent to the President of the Energy Regulatory Office, and also a notification was sent to the Public Prosecutor's Office.

Unleaded 98 - Details of samples that exceed tolerance limits:

Parameter	Limit Value	Tolerance Limit* (TL)	Max/Min value of samples tested	No samples outside TL	% samples outside TL
Summer vapour pressure, kPa	60	61.3	61.7	1	2.78%
Aromatics, % (v/v)	35	36	37.2	4	6.8%

Member State notes
The number of samples above tolerance limits did not exceed tolerance limits therefore no action was taken.

Table 24-4: Diesel Fuel Grades

Diesel - Details of samples that exceed tolerance limits:

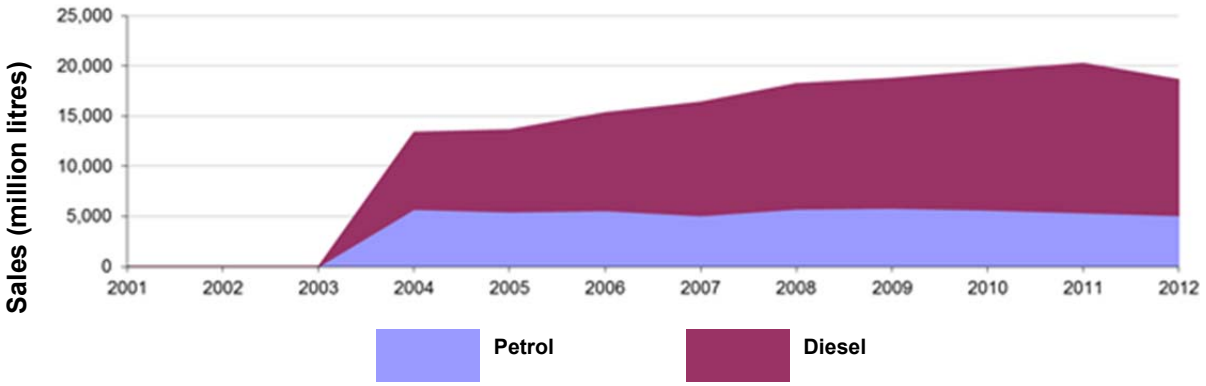
Parameter	Limit Value	Tolerance Limit* (TL)	Max/Min value of samples tested	No samples outside TL	% samples outside TL
Distillation – 95% Point	360	365.9	392.8	3	1.47%
Sulphur Content	10	11.3	68	3	1.47%
FAME Content	7	7.3	7.4	1	0.59%

Member State notes
For samples outside of tolerance limits a notification was sent to the President of the Energy Regulatory Office, and also a notification was sent to the Public Prosecutor's Office.

24.3 Temporal Trends

Figure 24-2 shows the trend in total fuel sales since Poland started to report Fuel Quality Monitoring in 2004. The graph shows a gradual increase of fuel sales; with proportionate increase in diesel sales with relatively consistent sales of petrol. Sales of diesel have increased by 43.4% since 2004 (increase of 5,878 million litres), with sales dropping in the period of 2011 to 2012 by 9.1% (1,350 million litres). Sales of petrol have decrease by 12.2% (623 million litres) since 2004, with a fall in sales in the 2011 to 2012 period of 5.1% (274 million litres).

Figure 24-2: Temporal trends in national sales of petrol and diesel (million litres)



24.4 Statistical Analysis

The following charts in this section are known as box-plots and they display the distribution of fuel characteristics per Member State by illustrating the:

- Sample minimum
- Lower 25% range
- Middle 50% range
- Median
- Upper 25% range
- Maximum

For a full explanation of the information presented in a Box Plot diagram, please see section 4.

Fuel sampling in Poland in 2012 recorded relatively few test results out of specification with limits.

The analysis charts for petrol (Figure 24-3) and diesel (Figure 24-4) detail the distribution of sample results for the 5 selected parameters;

Petrol:

- Research Octane Number
- Motor Octane Number
- Summer Vapour Pressure

Diesel:

- Density at 15^{o}C
- Distillation – 95% v/v recovered

Sample results for these parameters have been depicted using box plots based on the reported sample minimum, lower quartile (Q1), median (Q2), upper quartile (Q3), and the maximum sample value.

24.4.1 Petrol Analysis

Both fuel types show tight distributions; this is to be expected for RON 95 as there were many samples tested, however for RON 98 this shows that the fuel grade is consistent in Octane and DVPE sample results. RON 95 fuel type shows a distribution close to tolerance levels with a few samples exceeding tolerance limits for Octane and Summer Vapour Pressure. RON 98 has a few samples that exceed Summer Vapour Pressure.

Figure 24-3: Petrol analysis

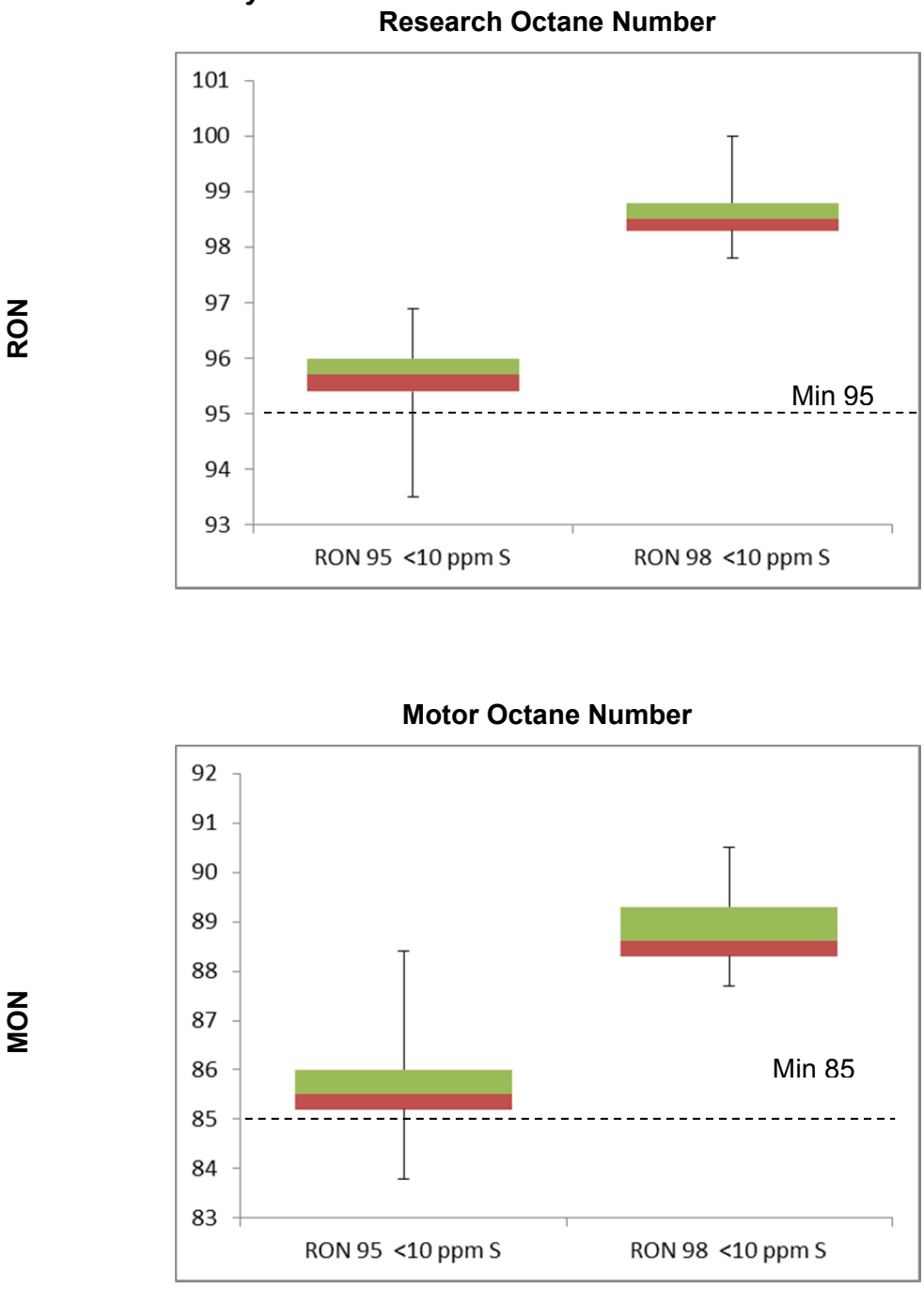
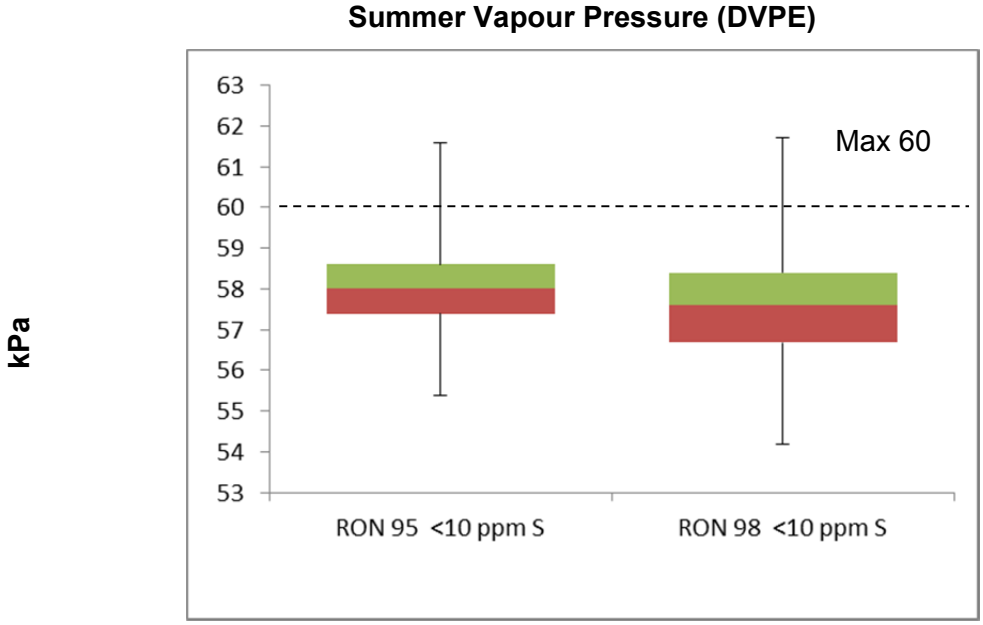


Figure 24-3: (continued)



24.4.2 Diesel Analysis

Density at 15°C analysis shows an even tight distribution which is far from tolerance limits. Distillation 95% v/v has a tight distribution close to tolerance limits, however only 3 diesel samples exceeded tolerance limits.

Figure 24-4: Diesel analysis

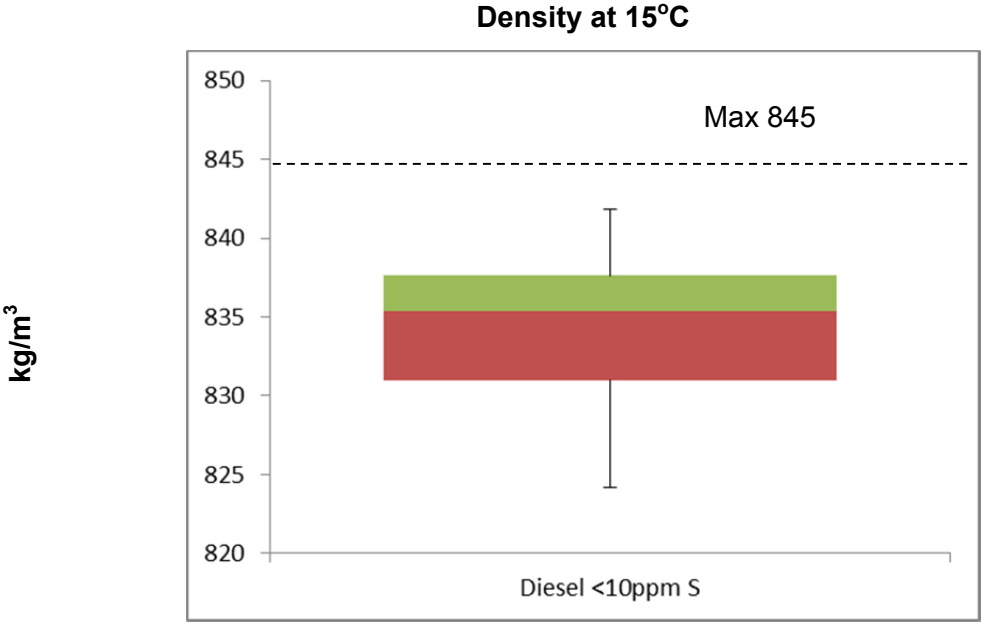
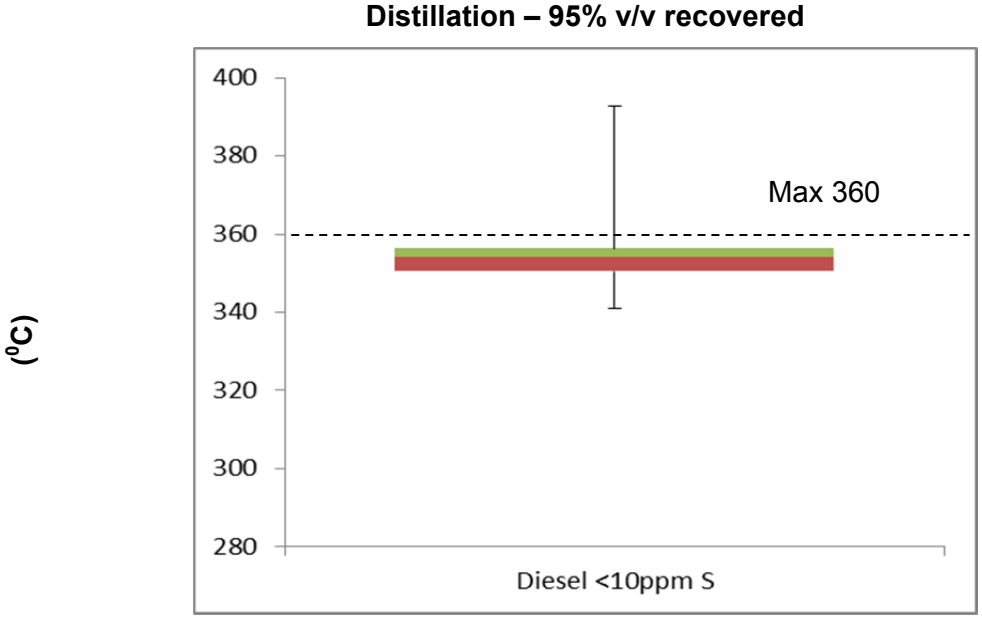


Figure 24-4: Diesel analysis (continued)



24.5 Key Areas for Improvement

The following table summarises the main areas in which improvements could be made to the monitoring system, reporting or compliance with Directive limit values. The table includes key recommendations from the previous year to give an assessment of what action has been taken by the Member State to address any issues that may have been highlighted.

Key Areas for Improvement (3 years)		
	Monitoring	**Reporting**
2012	• Poland did not provide sufficient samples for a country classed as 'Large' for either petrol or diesel samples. • Manganese was not reported.	The report was received on the 17 June, earlier than the 30 June deadline
2011	• Poland did not complete the statistical results section of the template and hence no statistical analysis charts for petrol or diesel are available to detail the distribution of sample results for the selected parameters. While this reporting element is not mandatory, additional information was requested by the Commission in order to enhance comparability and assessment of EU-wide FQM results. • Numbers of exceedances cannot be	The 2011 report was received on time. No information has been provided about test methods for 2011. The source of sales data for 2011 has not been provided. Poland did not use the EC approved template for their submission. They were one of only two Member States not to use the template in the 2011 reporting year.

Key Areas for Improvement (3 years)		
	Monitoring	**Reporting**
	determined due to insufficient detail provided regarding sample numbers which fall outside of tolerance limits. • Fuel sales are again over 15 Million tonnes and so Poland should be sampling and reporting as a 'Large' country according to EN 14274. Poland stated that they clarified this matter to the European Commission in 2012. • If they were classified as a large country, Poland did not report sufficient sample quantities for fuel grades that comprised less than 10% of the petrol or diesel market in 2011 to comply with the Directive. • Poland did not report parameter results for Manganese for petrol fuel grades in 2011. • Poland did not report parameter results for Distillation 95% or Polycyclic aromatic hydrocarbons for diesel B100 in 2011.	
2010	• Fuel sales are again over 15 Million tonnes and so Poland should be sampling and reporting as a 'Large' country according to EN 14274. • Consequently, sample numbers for fuels with over 10% market share were low.	• Report not in EC template. • Additional data requested by the Commission for 2010 has not been provided. • Test methods used in 2010 have not been confirmed. • The source of sales data has not been confirmed.

25 Portugal

25.1 Fuel Availability 2012

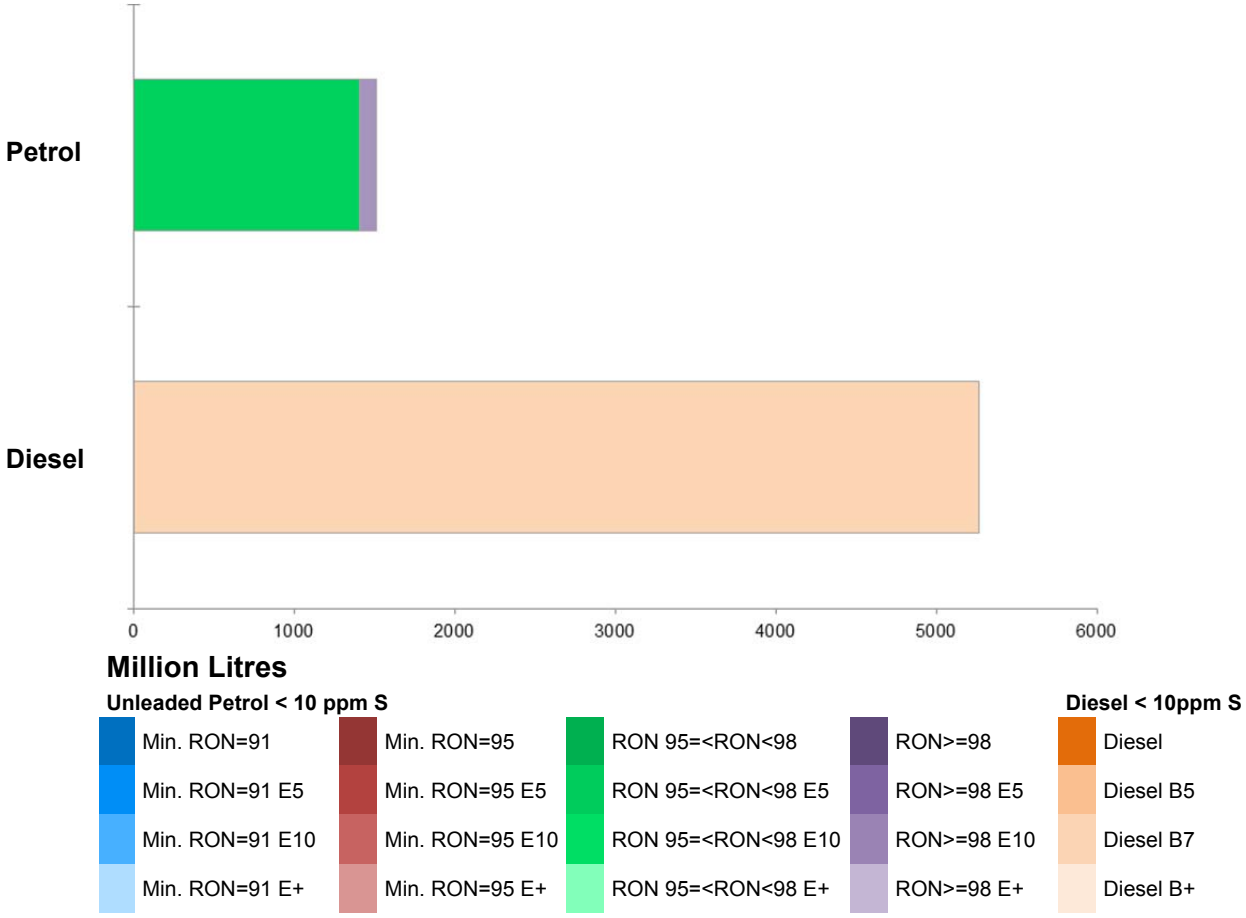
The following table lists the fuels that were reported to be available nationally in 2012.

Table 25-1: National fuel grade

Fuel grade	National fuel grade
Unleaded petrol (minimum 95 =< RON < 98)	Euro super
Unleaded petrol (minimum RON >= 98)	Super plus
Diesel fuel B7	Gasóleo

25.1.1 Sales, sampling and reporting

Figure 25-1: Fuel Sales proportions by fuel type



During 2012 fuel sales in Portugal were again dominated by diesel fuel sales. 5,268 million litres of diesel was sold in comparison to 1,513 million litres of petrol fuel sales (all petrol grades combined). Petrol fuel sales were mainly comprised (93%) of fuel grade RON 95.

Table 25-2: Fuel sales and sampling

Fuel type (Parent Grade)	Sales (Million litres)	Sales, % total of fuel type	Samples (1) S	Samples (1) W	Samples (1) TR (2)	Separate S/W(3)	Parameters measured (4)	Add. Notes
Unleaded petrol 95=<RON<98 (<10 ppm S)	1,403	92.71%	61	71	50	Yes	18 of 19	(a)
Unleaded petrol RON>=98 (<10 ppm S)	110	7.29%	58	67	4	Yes	18 of 19	(a)
Total Petrol	**1,513**	**100.00%**	**119**	**138**	**54**	**Yes**	**18 of 19**	
Diesel (<10 ppm sulphur) B7	5,268	100.00%	60	72	50	Yes	6 of 6	
Total Diesel	**5,268**	**100.00%**	**60**	**72**	**50**	**Yes**	**6 of 6**	

(1)	Samples	The actual number of samples taken by the Member State in the summer (s) and winter (w) periods
(2)	TR	Total requirement per summer and winter period according to EN 14274. Brackets () show where a national model is being used, and the requirement is indicative to demonstrate equivalence with EN14274.
(3)	Separate S & W?	Yes indicates separate summer & winter reporting, and No indicates full year sample results reporting only.
(4)	Parameters measured	Currently 19 petrol parameters should be tested and reported by the Member States and 6 diesel parameters.
(a)	Additional notes	Portugal did not report any parameter results for Manganese for any of their petrol fuel grades.

25.1.1.1 Petrol Samples

Portugal have complied with or exceeded minimum sampling requirements for all petrol fuel grades.

25.1.1.2 Diesel Samples

Diesel fuel samples tested in 2012 complied with or exceeded the total minimum requirement.

25.2 Fuel Quality Monitoring 2012

25.2.1 Description of System

Responsible organisation(s)	Ministry of Economy and Employment and the Directorate General for Energy and Geology
Fuel Quality Monitoring System (FQMS)	EN 14274 Statistical Model C
Country Size	Small
Summer Period	Normal

Location(s) of sampling	Service stations and refineries. Samples in retail sites are taken across the country by government authorities and were taken most months across the winter and summer periods. The minimum number of tests established for small countries, (300 tests / year) was held at service stations. In addition to these tests was considered a sample of 89 tests carried out at refineries and terminals. This sample was composed of 32 tests for I.O.95, 25 for I.O.98 and 32 for diesel.
Time/frequency of sampling	Samples have been taken in 10 months throughout the year 2012.
Specification of test methods	Test methods are those specified in Directive 98/70/CE.
Collection of sales data	According to national legislation the companies report monthly their sales to the Directorate General for Energy and Geology (DGEG).

Other details

The FQMS is unchanged. There are two refineries that supply the market, one of them in the north and the other in the south.

The companies themselves carry out tests, taking samples in refineries and terminals and their frequency is roughly monthly, throughout the year.

Tests were conducted in 2012, at refuelling sites, refineries and terminals. The minimum number of samples per year set for small countries is 300 samples/year taken from service stations. Samples that exceed tolerance limits correspond to samples collected from service stations. These infractions are punishable by a fine, which involves reporting to the responsible authority for prosecution. Sampling took place during periods of summer and winter.

25.2.2 Fuel Quality Monitoring System

25.2.2.1 Sampling

The bodies performing sampling and analysis are selected through a public tender held by the Ministry of Economy and Employment.

300 samples are taken in retail sites across the country in most months across the winter and summer periods. The selection of filling stations is made by government authorities. Beyond this sample is conducted at refineries and terminals.

The methods of analysis used are in accordance with Directive nº 2009/30/EC. The method used for each parameter can be found in the "Test methods and analyses" tables of Reporting Results tables, where the number of values exceeded and their values are indicated.

25.2.2.2 FQMS administration

The body responsible at national level for the FQMS is the Ministry of Economy and Employment and the Directorate General for Energy and Geology, the body that coordinates, prepares and submits the annual reports. Sampling and analysis are performed by entities selected through public tender. Non-compliant samples are reported to the Food Safety and Economic Authority (ASAE).

There are two refineries that supply the market, one of them in the north and the other in the south.

25.2.2.3 National Legislation that transposed the FQD

The transposition of FQMS is set out in Articles 13º and 14º of Decree-Law nº 142/2010 of 31 December.

25.2.2.4 Reporting periods

Seasonal period: Summer period - 1st May to 30th September (normal).

Winter period – 1st November to 31 March

Transition period - April and October

Analysis is performed occasionally at filling stations in transitional periods; not considered for the purposes of FQMS. In refineries and terminals analysis are performed monthly, throughout the year but transitional periods are not considered for the purposes of FQMS.

25.2.3 Compliance with Fuel Quality Limit Values

Table 25-3: Petrol Fuel Grades

Eurosuper Petrol - Details of samples that exceed tolerance limits:					
Parameter	**Limit Value**	**Tolerance Limit* (TL)**	**Max/Min value of samples tested**	**No samples outside TL**	**% samples outside TL**
Research Octane Number	95	94.6	92.5	4	3.03%
Motor Octane Number	85	84.5	82.6	4	3.03%
Distillation at 100°C	46	43.6	43.3	1	0.76%
Sulphur content	10	13	81.3	3	2.27%
Member State notes All the results of lead content analysis were expressed as < 0.001g/l or <0,003g/l. For purposes of calculation these values were regarded as exact figures, which mean that the true values are smaller than the reported. For purpose of calculation all the results of methanol, ethanol and other oxygenates expressed as < 0.10%(v/v), <0,2%(v/v) and <0,8%(v/v) were considered as exact figures. That means that the true values are smaller than the reported. As defined in EN 14274:2003 fuel samples taken during transition periods are not included in the FQMS. The introduction in the consumption or marketing of fuels that do not meet the specifications in force constitutes an infraction punishable by fine, which involves reporting to the responsible authority for the prosecution.					
Super Plus Petrol - Details of samples that exceed tolerance limits:					
Parameter	**Limit Value**	**Tolerance Limit* (TL)**	**Max/Min value of samples tested**	**No samples outside TL**	**% samples outside TL**
Research Octane Number	95	94.6	92.7	2	1.60%
Motor Octane Number	85	84.5	83	3	2.40%
Summer vapour pressure, kPa	60	61.8	71.7	13	22.41%
Sulphur content	10	13	80.7	3	2.40%
Member State notes All the results of lead content analysis were expressed as < 0.001g/l or <0,003g/l. For purposes of calculation these values were regarded as exact figures, which mean that the true values are smaller					

than the reported. For purpose of calculation all the results of methanol, ethanol and other oxygenates expressed as < 0.10%(v/v), <0,2%(v/v) and <0,8%(v/v) were considered as exact figures. That means that the true values are smaller than the reported. As defined in EN 14274:2003 fuel samples taken during transition periods are not included in the FQMS.

The introduction in the consumption or marketing of fuels that do not meet the specifications in force constitutes an infraction punishable by fine, which involves reporting to the responsible authority for the prosecution.

Table 25-4: Diesel Fuel Grades

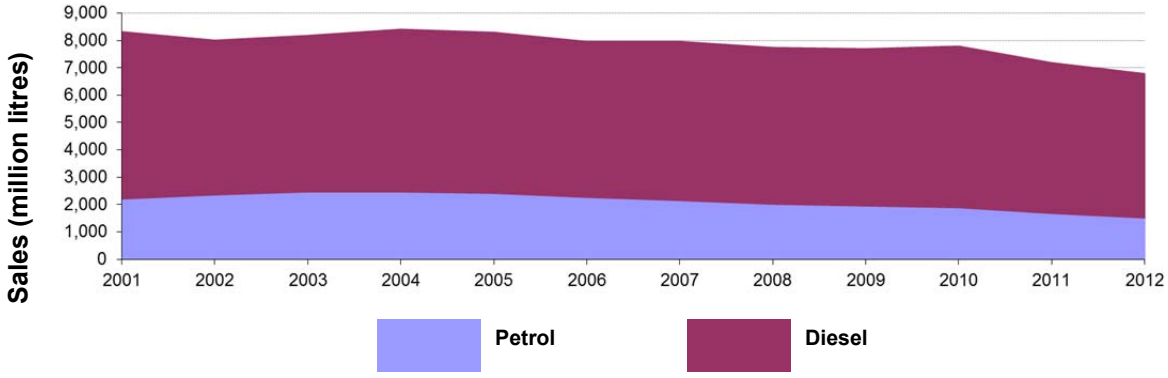
Diesel - Details of samples that exceed tolerance limits:					
Parameter	**Limit Value**	**Tolerance Limit* (TL)**	**Max/Min value of samples tested**	**No samples outside TL**	**% samples outside TL**
Cetane Number	51.0	48.5	48	1	0.76%
Density at 15°C	845	845.7	845	1	0.76%
Sulphur content, mg/kg	10	11.8	30	2	1.52%

Member Notes
As defined in EN 14274:2003 fuel samples taken during transition periods are not included in the FQMS.
The introduction in the consumption or marketing of fuels that do not meet the specifications in force constitutes an infraction punishable by fine, which involves reporting to the responsible authority for the prosecution.

25.3 Temporal Trends

Figure 25-2 shows the trend in total fuel sales since 2001. Fuel sales grew and fluctuated before gradually decreasing from 2004. Both diesel and petrol sales have fallen since 2001 by 15.8% (839 million litres) and 45.8% (694 million litres) respectively. In the period 2011 to 2012 diesel and petrol sales have fallen by 4.3% (236 million litres) and 9.8% (164 million litres) respectively.

Figure 25-2: Temporal trends in national sales of petrol and diesel (million litres)



25.4 Statistical Analysis

The following charts in this section are known as box-plots and they display the distribution of fuel characteristics per Member State by illustrating the:

- Sample minimum

- Lower 25% range
- Middle 50% range
- Median
- Upper 25% range
- Maximum

For a full explanation of the information presented in a Box Plot diagram, please see section 4.

Fuel sampling in Portugal in 2012 recorded relatively few test results out of specification with limits. The analysis charts for petrol (Figure 25-3) and diesel (Figure 25-4) detail the distribution of sample results for the 5 selected parameters;

Petrol:

- Research Octane Number
- Motor Octane Number
- Summer Vapour Pressure

Diesel:

- Density at 15^{o}C
- Distillation – 95% v/v recovered

Sample results for these parameters have been depicted using box plots based on the reported sample minimum, lower quartile (Q1), median (Q2), upper quartile (Q3), and the maximum sample value.

25.4.1 Petrol Analysis

Sample results in 2012 have been presented in the following figures with limit values for the parameter (maximum or minimum) to demonstrate the skew of sample results. Analysis of RON and MON show a wide distribution of results from samples taken, with some outliers showing non-compliance of tolerance limits for both, especially for the test of RON.

The analysis of summer vapour pressure shows an even distribution, which is below tolerance limits, for RON 95, however RON 98 shows a distribution which has a significant number of samples outside of tolerance limits.

Figure 25-3: Petrol analysis

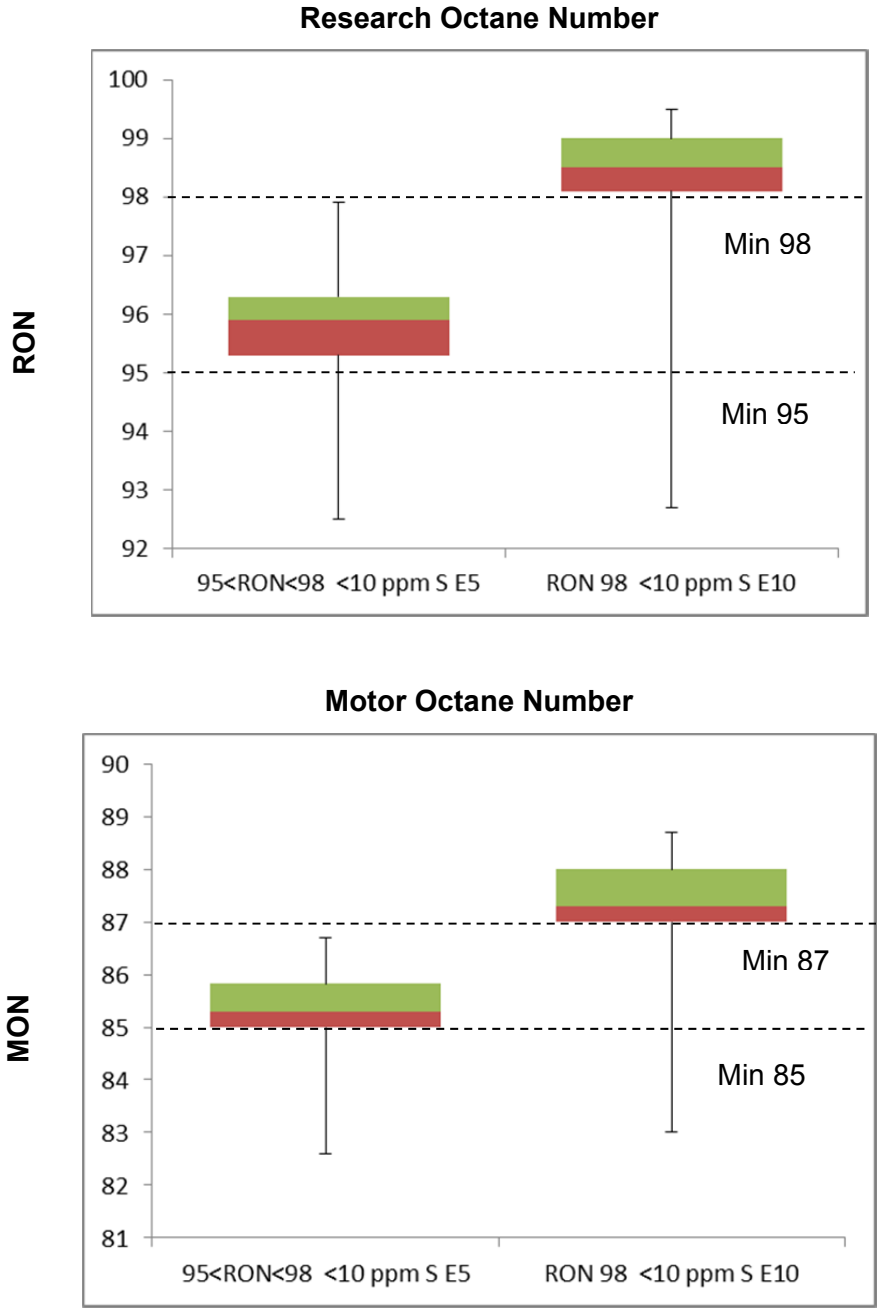
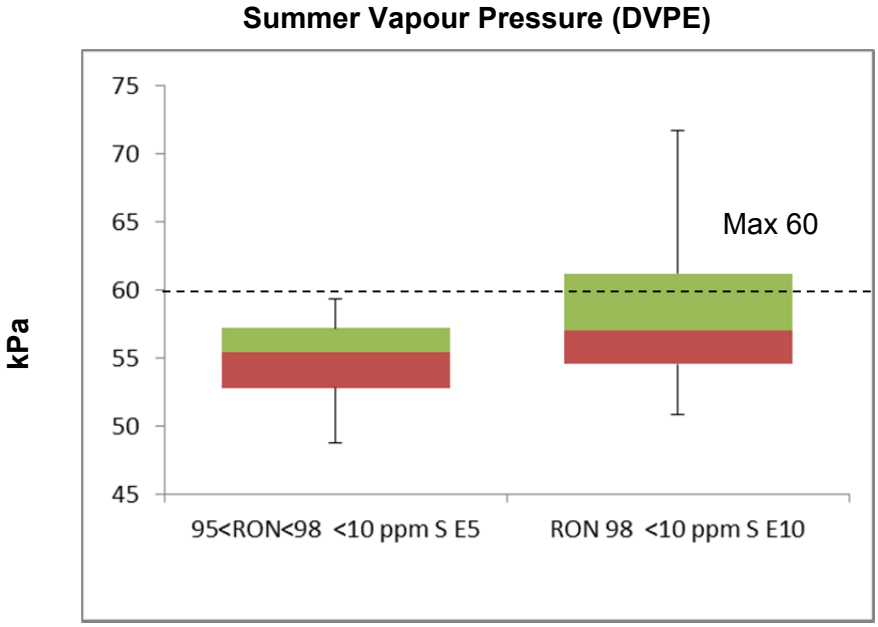


Figure 25-3: Petrol analysis (continued)



25.4.2 Diesel Analysis

Distillation and Density analysis of diesel samples reveal a skewed distribution close to tolerance limits, with only a few outliers exceeding tolerance limits.

Figure 25-4: Diesel analysis

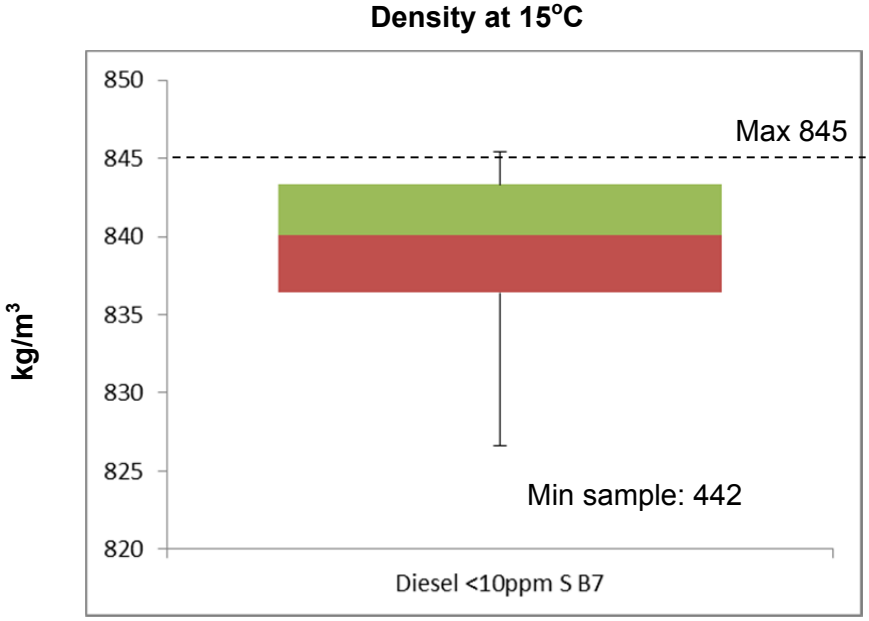
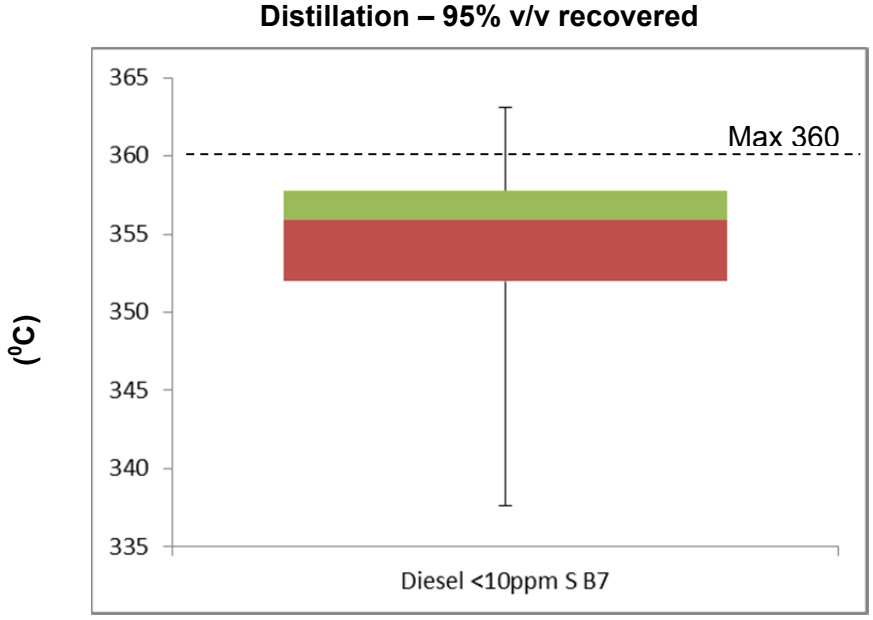


Figure 25-4: Diesel analysis (continued)



25.5 Key Areas for Improvement

The following table summarises the main areas in which improvements could be made to the monitoring system, reporting or compliance with Directive limit values. The table includes key recommendations from the previous year to give an assessment of what action has been taken by the Member State to address any issues that may have been highlighted.

Key Areas for Improvement (3 years)		
	Monitoring	**Reporting**
2012	• Further details for the non-compliance regime are required especially in regards to summer vapour pressure and sulphur content in petrol fuel grades. • Portugal did not report any parameter results for Manganese for any of their petrol fuel grades in 2012.	The report was received on the 28th June, before the 30th June deadline.
2011	• Location of sampling could benefit from further clarification. • Portugal did not report any parameter results for Manganese for any of their petrol fuel grades in 2011.	The 2011 report was submitted on time.
2010	• Fuel sales were not provided separated by region.	The report was submitted after the deadline

26 Romania

26.1 Fuel Availability 2012

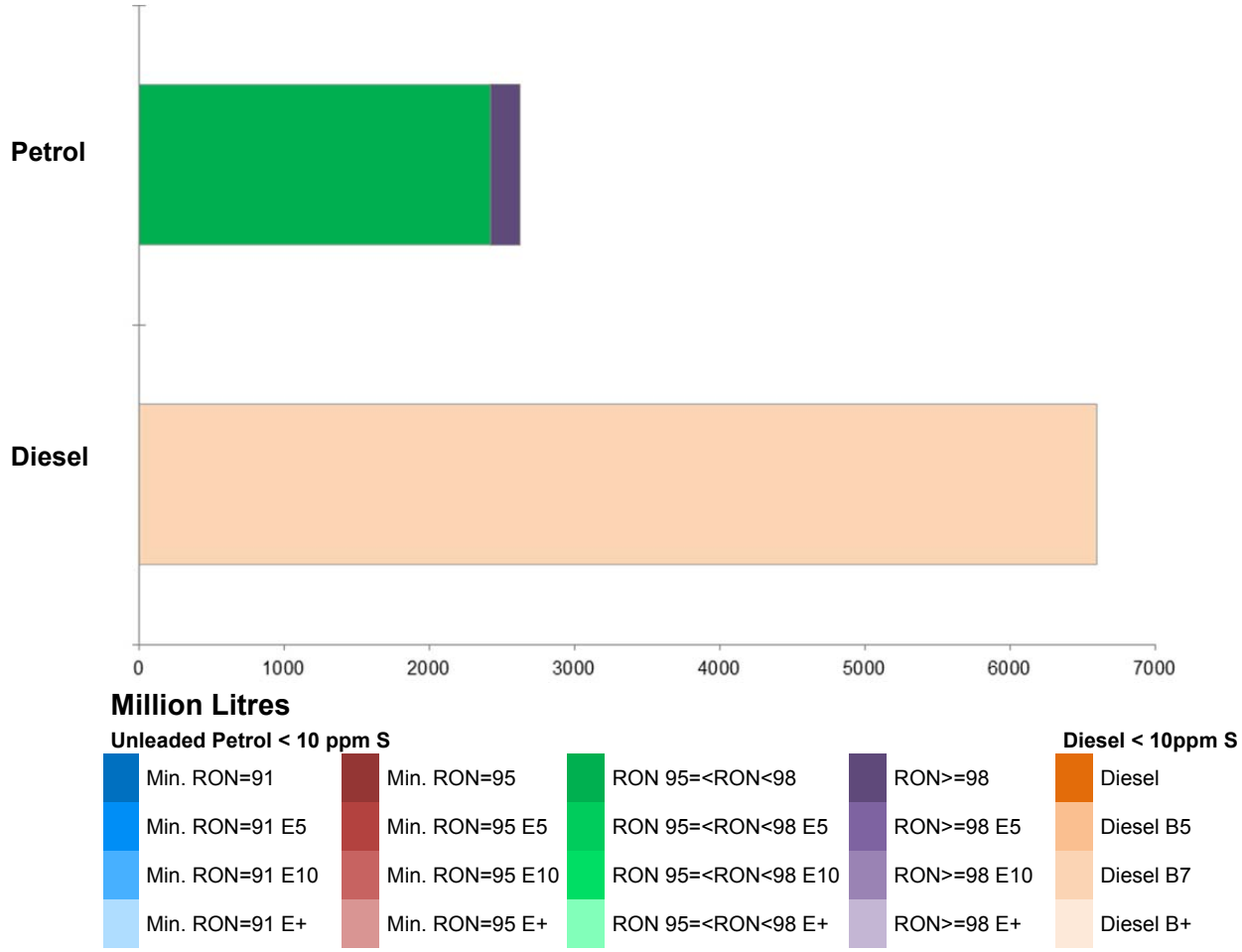
The following table lists the fuels that were reported to be available nationally in 2012.

Table 26-1: National fuel grade

Fuel grade	National fuel grade
Unleaded petrol (minimum 95 =< RON < 98) E5	RON 95
Unleaded petrol (minimum RON >= 98) E5	RON 98
Diesel fuel B5	Diesel

26.1.1 Sales, sampling and reporting

Figure 26-1: Fuel Sales proportions by fuel type



During 2012 fuel sales in Romania were dominated by diesel fuel sales; 6,602 million litres of diesel was sold in comparison to 2,623 petrol fuel sales (all petrol grades combined). 92% of petrol fuel sales were mainly comprised of fuel grade RON 95 E5.

Table 26-2: Fuel sales and sampling

Fuel type (Parent Grade)	Sales (Million litres)	Sales, % total of fuel type	Samples (1) S	Samples (1) W	Samples (1) TR (2)	Separate S/W(3)	Parameters measured (4)	Add. Notes
Unleaded petrol 95=<RON<98 (<10 ppm S) E5	2,418	92.20%	99	105	100	Yes	18 of 19	(a)
Unleaded petrol RON>=98 (<10 ppm S) E5	205	7.80%	16	24	4	Yes	18 of 19	(a)
Total Petrol	**2,623**	**100.00%**	**115**	**129**	**104**	**Yes**	**18 of 19**	
Diesel (<10 ppm sulphur) B5	6,602	100.00%	118	125	100	Yes	6 of 6	
Total Diesel	**6,602**	**100.00%**	**118**	**125**	**100**	**Yes**	**6 of 6**	

(1)	Samples	The actual number of samples taken by the Member State in the summer (s) and winter (w) periods
(2)	TR	Total requirement per summer and winter period according to EN 14274. Brackets () show where a national model is being used, and the requirement is indicative to demonstrate equivalence with EN14274.
(3)	Separate S & W?	Yes indicates separate summer & winter reporting, and No indicates full year sample results reporting only.
(4)	Parameters measured	Currently 19 petrol parameters should be tested and reported by the Member States and 6 diesel parameters.
(a)	Additional notes	Manganese parameter not measured for any petrol fuel grades.

26.1.1.1 Petrol Samples

Petrol fuel samples tested in 2012 only complied with the total minimum requirement for winter samples for RON 95 E5; summer samples were less than the 100 required under EN14274. Petrol samples for RON 98 were compliant with total minimum requirements as they have less than 10% share.

26.1.1.2 Diesel Samples

Diesel fuel samples tested in 2012 complied with the total minimum requirement.

26.2 Fuel Quality Monitoring 2012

26.2.1 Description of System

Responsible organisation(s)	Ministry of Economy, Trade and Business Environment
Fuel Quality Monitoring System (FQMS)	EN 14274 Statistical model B
Country Size	Small
Summer Period	Normal
Location(s) of sampling	Romania is divided in 8 regions. Samples were taken at filling stations that deliver fuel to private and commercial users; fuel was provided to the stations by oil companies

	(local, national and international). Therefore samples were taken randomly over the identified regions.
Time/frequency of sampling	Samples have been taken in two months of the summer periods and three months of the winter periods for unleaded petrol 95 E5 and Diesel. Samples have been taken in two months of the summer periods and two month of the winter periods for unleaded petrol 98 E5.
Specification of test methods	Test methods are mentioned in both petrol and diesel specific standards: a) SR EN 228 automotive fuels, unleaded petrol, requirements and test methods. b) SR EN 590 automotive fuels, diesel fuels, requirements and test methods. According to Order no.58/2006 in the monitoring system of petrol and diesel, work sampling is done at least two bodies
Collection of sales data	Details of whom provided sales data is not provided

Other details

Romania is in the process of transposing EU legislation into national legislation via Government Decision no. 928/2012. Regarding the establishment of legislation for marketing gasoline and diesel, this has been imposed by Government Decision no. 1308/2012. These two Government decisions take the full provisions of Directive 98/70/EC on the quality of petrol and diesel and amendments contained in Directive 2003/17/EC.

In applying the provisions of this Decision, the Ministry of Economy, Trade and the Business the Environment is responsible for implementing the "qualitative and quantitative monitoring system for petrol and diesel," sold by service stations, approved by Minister through Order no.742/2004, whose annex was replaced by Order no.58/2006.

Sampling and analysis of petrol and diesel is done by testing laboratories, which are recognized for this purpose by the Ministry; recognition is made after a trial assessment, based on the criteria set forth in Annex 1 of the Order no.742/2004, replaced by Order no.58/2006:

• be accredited for testing, field / certification schemes on the quality of petrol and diesel;

• to have liability insurance;

• to demonstrate its own sampling capability, equipped with appropriate equipment to perform tests according to the methods stipulated in Government Decree amended and supplemented nr.928/2012.

The monitoring procedure consists of sampling, analysis and verification that marketing of petrol and diesel are compliant. SR EN 14275 is used as the sampling method- torch sampling pumps at filling stations and networks outside the private network stations.

Test methods follow the following standards:

a) SR EN 228 for unleaded petrol.

b) SR EN 590 for diesel fuels.

According to Order no.58/2006 in the monitoring system of petrol and diesel, work sampling

is done by at least two bodies.

After evaluating the requests received from organizations, the Ministry of Economy, Trade and Business the Environment recognized SC ROMPETROL QUALITY CONTROL SRL and SC ROMCONTROL SA to perform sampling activities. Both ROMPETROL QUALITY CONTROL SRL and SC ROMCONTROL SA are accredited EN ISO/CEI 17025 to perform physic-chemical testing and analysis for fuels.

Based on the result as "qualitative and quantitative monitoring system for petrol and diesel" the National Annual Report is prepared. This report which contains information on petrol and diesel quality and the quantity of petrol and diesel sold on previous the year.

Framework for presenting the report is provided by the provisions of the Ministerial Order no.662/2004 establishing a common format for submission of national annual report concerning fuel quality placed on the market, which fully transposes Decision no.2002/159/EC.

Romania is divided in 8 regions. Samples were taken at filling stations that deliver fuel to private and commercial users; fuel was provided to the stations by oil companies (local, national and international). Therefore samples were taken randomly over the identified regions. Since the total amount of petrol and diesel fuel used in Romania was below 15 million tonnes in 2011, Romania is regarded as a small country (European Standard EN 14274:2003, paragraph 3.2) and due to the lack of sales data per region, Statistical Model B as prescribed in European Standard EN 14274:2003 was applied. in the process of transposing EU legislation, in national legislation was adopted the Government Decision no. 689/2004 regarding the establishment of marketing of gasoline and diesel, modified and completed by Government Decision no. 15/2006.

26.2.2 Fuel Quality Monitoring System

26.2.2.1 Sampling

Sampling performed in fuel stations (from fuel pump); Random selection of sampling points, from all regions; Sampling performed according to SR EN 14275 "Automotive fuel. Sampling from retails site pumps and commercial site fuel dispensers" and Ministry Order no.2459/12.11.2012 approving system of monitoring quality fuels. Tests performed according SR EN 228:2008 and SR EN 590+A1:2010 methods (reference norms valid during 2012).

26.2.2.2 FQMS administration

Ministry of Economy has responsibility for managing and implementing the FQM Directive. Fuel sampling is carried out by contracted privately and Ministry of Economy sets the minimum annual number of samples, the place and moment of sampling and the recognized body which carried out sampling. The National Authority for Consumer Protection and National Tax Administration are responsible for taking action where non-compliant samples have been discovered. Monitoring of fuel quality was first implemented by Order of the minister of economy and trade no.742/19.11.2004. It was applied EN 14274 model B according the dimension and fuel consumption of country. The number of national refineries is 10 and 2444 fuel station.

26.2.2.3 National Legislation that transposed the FQD

- Government Decision no.928/12.09.2012 establishing the conditions for the marketing of gasoline and diesel and introducing a mechanism to monitor and reduce emissions of greenhouse gases;
- Government Decision no.935/21.09.2012 on the promotion of biofuels and bio-liquids; Both of Government Decision were modified by Government Decision no.1308/27.12.2012; Order of minister of economy, trade and business environment no.2458/12.11.2012 approving the form of presentation of

information regarding the gasoline and diesel quantities on the market, detailed types and Romanian development regions, by producers, importers and final distributors of gasoline and diesel;

- Order of minister of economy, trade and business environment no.2459/12.11.2012 approving monitoring system of gasoline and diesel quality

26.2.2.4 Reporting periods

Sampling covered all 3 periods: summer, transition, winter. An 'Arctic' derogation has been granted. The results of samples during the transition period are reported within the annual fuel quality report.

26.2.3 Compliance with Fuel Quality Limit Values

Table 26-3: Petrol Fuel Grades

Unleaded petrol (min 95 =< RON < 98)- Details of samples that exceed tolerance limits:					
Parameter	**Limit Value**	**Tolerance Limit* (TL)**	**Max/Min value of samples tested**	**No samples outside TL**	**% samples outside TL**
Oxygen content, % (m/m)	3.7	3.9	12.75	2	0.98%
Methanol, % V/V	3	3.2	27.75	1	0.49%
Sulphur content, mg/kg	10	10.6	19	1	0.49%
Lead content, g/l	0.005	0.0054	0.009	2	0.98%
Member State notes: Penalty					
Unleaded petrol (min RON >= 98)- Details of samples that exceed tolerance limits:					
No samples exceeded tolerance limits.					

Table 26-4: Diesel Fuel Grades

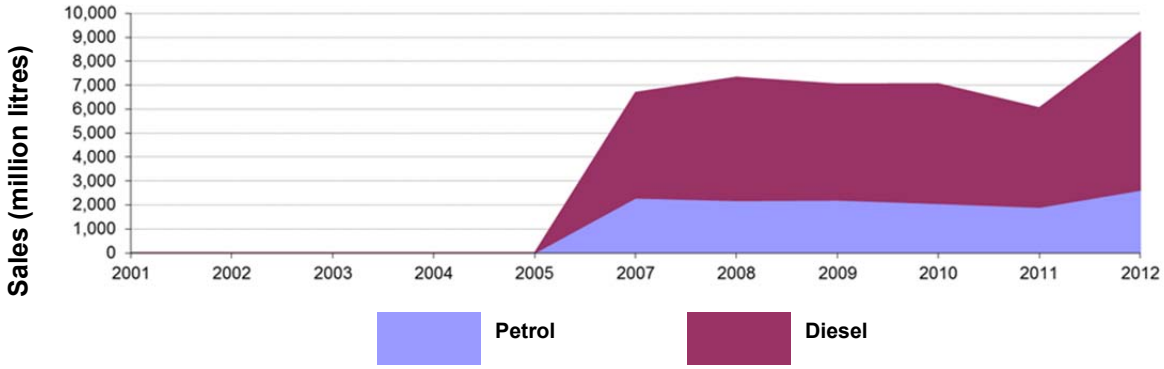
Diesel - Details of samples that exceed tolerance limits:					
Parameter	**Limit Value**	**Tolerance Limit* (TL)**	**Max/Min value of samples tested**	**No samples outside TL**	**% samples outside TL**
Distillation – 95% Point ^{o}C	360	365.9	382	2	0.82%
Sulphur content, mg/kg	10	11.3	117.2	4	1.65%
Member State notes: Penalty					

26.3 Temporal Trends

Figure 26-2 shows the trend in total fuel sales since 2006. Fuel sales rose from 2006 to 2008, and then declined to 2011. Since 2006 petrol and diesel sales have increased by 25% (665 million tonnes) and 44.1% (2,911 million tonnes). In 2011 to 2012 petrol sales have increased by 37.4% (714 million tonnes), whilst diesel sales have increased dramatically by

59.1% (2,453 million tonnes). Overall the 2011 to 2012 period has seen an unprecedented growth of fuel sales.

Figure 26-2: Temporal trends in national sales of petrol and diesel (million litres)



26.4 Statistical Analysis

From 2010 the Commission have requested that Member States provide some additional information to enable further statistical analysis of fuel quality reported by Member States. In order to carry out further analysis, the Member States have been asked to provide the following details for each parameter;

- Sample minimum
- Lower 25% range (from 2010)
- Middle 50% range
- Median (from 2009)
- Upper 25% range (from 2010)
- Maximum

This information is then used to generate box diagrams which can help to display fuel conditions within individual Member States – and in comparison to other Member States within EU-wide summary sections of this report). For a full explanation of the information presented in a Box Plot diagram, please see section 4.

Parameters selected by the Commission for further analysis were;

Petrol:

- Research Octane Number
- Motor Octane Number
- Summer Vapour Pressure

Diesel:

- Density at 15^{o}C
- Distillation – 95% v/v recovered

However, Romania has not provided the additional information and so it has not been possible to include the statistical analysis.

26.5 Key Areas for Improvement

The following table summarises the main areas in which improvements could be made to the monitoring system, reporting or compliance with Directive limit values. The table includes key recommendations from the previous year to give an assessment of what action has been taken by the Member State to address any issues that may have been highlighted.

Key Areas for Improvement (3 years)		
	Monitoring	**Reporting**
2012	• Petrol grade fuel samples were under the minimum requirement for the summer period • Samples were taken over a limited number of months. • Romania did not complete the statistical results section of the template and hence no statistical analysis charts for petrol or diesel are available to detail the distribution of sample results for the selected parameters. While this reporting element is not mandatory, additional information has been requested by the Commission in order to enhance comparability and assessment of EU-wide FQM results. • Romania did not report parameter results for Manganese for any petrol fuel grade.	The 2012 report was submitted on the 2nd July, after the 30th June deadline.
2011	• Romania did not complete the statistical results section of the template and hence no statistical analysis charts for petrol or diesel are available to detail the distribution of sample results for the selected parameters. While this reporting element is not mandatory, additional information has been requested by the Commission in order to enhance comparability and assessment of EU-wide FQM results. • Petrol fuel samples tested in 2011 only complied with the total minimum requirement for summer samples for RON 95 E5; winter samples were less than the 100 required under EN14274. • Diesel fuel samples tested in 2011 complied with the total minimum	The 2011 report was submitted on time.

Key Areas for Improvement (3 years)		
	Monitoring	**Reporting**
	requirement for summer samples only. Winter sample numbers for diesel were not compliant with minimum requirements. • Romania did not report parameter results for Manganese for any petrol fuel grade in 2011.	
2010	• Did not undertake the minimum sampling requirements for petrol grades. • Did not provide details of the test method used and the number of samples found to be out of compliance with specifications.	The statistical analysis section of the template was not completed Did not submit their report by the deadline.

27 Slovakia

27.1 Fuel Availability 2012

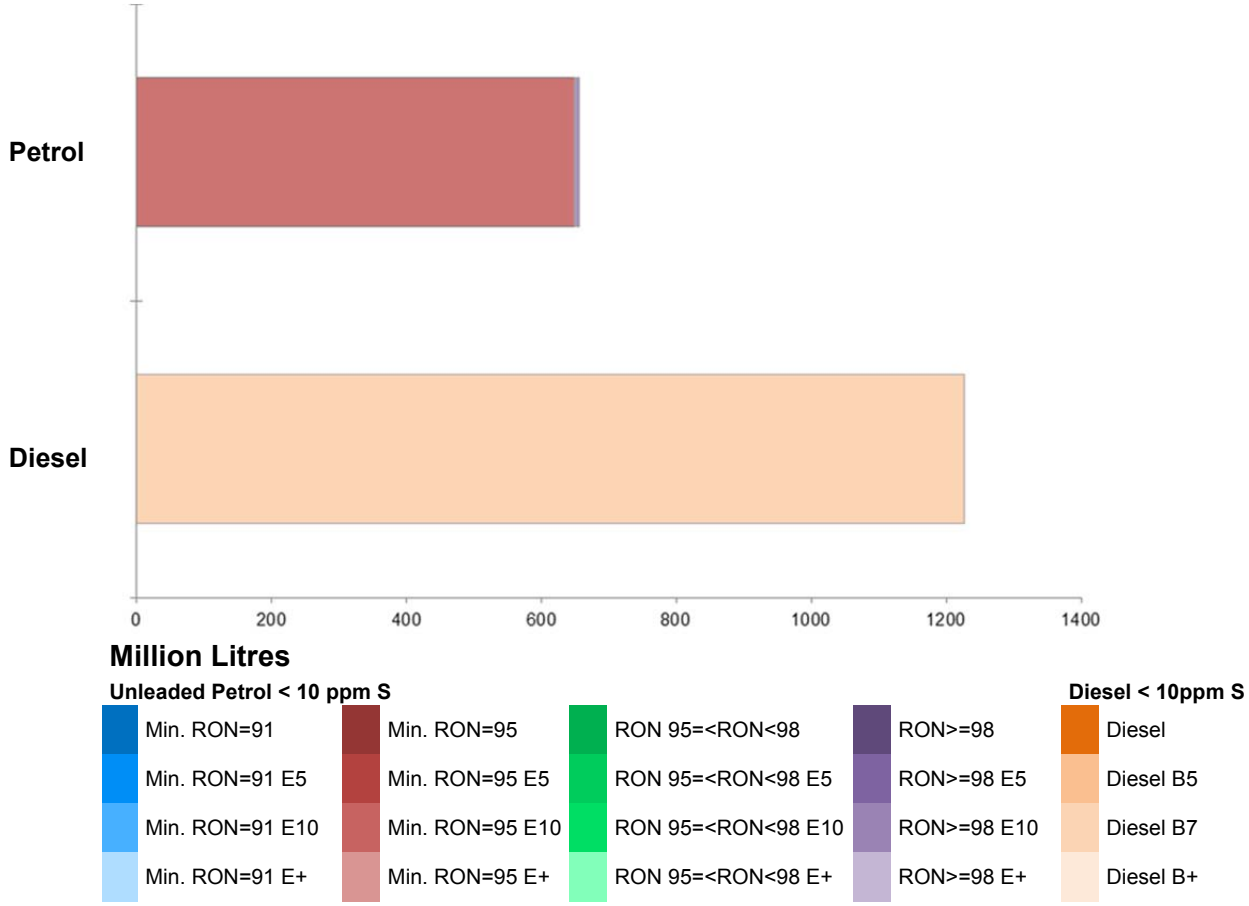
The following table lists the fuels that were reported to be available nationally in 2012.

Table 27-1: National fuel grade

Fuel grade	National fuel grade
Unleaded petrol (minimum RON = 95) E10	Super 95
Unleaded petrol (minimum RON >= 98) E10	SuperPlus 98
Diesel fuel B7	Diesel

27.1.1 Sales, sampling and reporting

Figure 27-1: Fuel Sales proportions by fuel type



During 2012 fuel sales in Slovakia were again dominated by diesel fuel sales; 1,227 million litres of diesel was sold in comparison to 656 million litres of petrol fuel sales (all petrol grades combined). Petrol fuel sales were mainly comprised (98.9%) of fuel grade RON 95 with up to 10% biofuel content with the remaining 1.1% petrol fuel sales of RON 98 with up to 10% biofuel content.

Table 27-2: Fuel sales and sampling

Fuel type (Parent Grade)	Sales (Million litres)	Sales, % total of fuel type	Samples (1) S	Samples (1) W	Samples (1) TR (2)	Separate S/W(3)	Parameters measured (4)	Add. Notes
Unleaded petrol min. RON=95 (<10 ppm S) E10	649	98.92%	61	57	50	Yes	19 of 19	
Unleaded petrol RON>=98 (<10 ppm S) E10	7	1.08%	16	15	1	Yes	19 of 19	
Total Petrol	**656**	**100.00%**	**77**	**72**	**51**	**Yes**	**19 of 19**	
Diesel (<10 ppm sulphur) B7	1,227	100.00%	61	57	50	Yes	6 of 6	
Total Diesel	**1,227**	**100.00%**	**61**	**57**	**50**	**Yes**	**6 of 6**	

(1)	Samples	The actual number of samples taken by the Member State in the summer (s) and winter (w) periods
(2)	TR	Total requirement per summer and winter period according to EN 14274. Brackets () show where a national model is being used, and the requirement is indicative to demonstrate equivalence with EN14274.
(3)	Separate S & W?	Yes indicates separate summer & winter reporting, and No indicates full year sample results reporting only.
(4)	Parameters measured	Currently 19 petrol parameters should be tested and reported by the Member States and 6 diesel parameters.

27.1.1.1 Petrol Samples

Slovakia has complied with minimum sampling requirements for all petrol fuel grades. RON 95 E10 has less than 10% share and therefore requires a smaller number of samples.

27.1.1.2 Diesel Samples

Diesel fuel samples have exceeded the minimum requirement for a small country monitoring and reporting using EN 14274 statistical model C which requires 50 samples to be taken per fuel per period.

27.2 Fuel Quality Monitoring 2012

27.2.1 Description of System

Responsible organisation(s)	VURUP, a.s. (Accredited Testing Laboratories & Accredited Inspection Body)
Fuel Quality Monitoring System (FQMS)	EN 14274 Statistical Model C
Country Size	Small
Summer Period	Normal
Location(s) of sampling	Service Stations
Time/frequency of sampling	Sampling of all fuel grades and types takes place in 9 months of the year – during 4 months in winter, and 5 in summer.

Specification of test methods	For petrol, test methods specified in 2009/30/EC or EN228:2008 and for Diesel, test methods specified in 98/70/EC or EN590: 590 have been used in 2012.
Collection of sales data	The institute VÚRUP received the sale data from Ministry of Environment (sales data is provided directly from fuel dispensing sites).

Other details

Besides the required analyses, the density of each petrol sample had been determined. This data was used for recalculation of the litres sold to tonnes of each petrol grade.

Petrol sold contained bio-components (ethanol and ETBE) according to EN 228. Diesel fuel contained FAME up to 7% V/V. Consumers have been informed about biofuel content by newspapers, journals for motorists and information in radio and television.

27.2.2 Fuel Quality Monitoring System

27.2.2.1 Sampling

• The organisation responsible for sampling, analysis and reporting is VURUP, (Accredited Testing Laboratories & Accredited Inspection Body, www.snas.sk).

• Types of locations at which sampling is carried out: refuelling stations only.

• Frequency of sampling and selection of sampling points: during summer and winter period, selection of sampling points is made by management of Testing Laboratories from database of refuelling stations.

• The applied monitoring system is equivalent of the CEN system.

27.2.2.2 FQMS administration

Public bodies responsible for managing and implementing of the FQM Directive: Ministry of Environment and Slovak Inspection of Environment.

Fuel sampling is carried out by contracted institution (VÚRUP) accredited according to EN ISO/IEC 17020 and EN ISO/IEC 17025 selected by public competition. The annual data concerning the sale of petrol and diesel is provided by Ministry of Environment. When non-compliant samples are discovered the Slovak Inspection of Environment is responsible for taking action (financial punishment). In Slovakia the EN 14274 model C was applied from August 2004. Number of National refineries: 1 (Bratislava), number of distribution terminals: 2 (SLOVNAFT). The Annual Fuel Quality Monitoring data report is provided every year by the deadline (30th June).

27.2.2.3 National Legislation that transposed the FQD

The Fuel Quality Directive has been transposed into Slovak national law system in the form of Ministerial Decree No. 362/2010 establishing fuel quality requirements and keeping records of fuel. This Decree fully transposed the Directives: 98/70/EC, 2003/17/EC, 1999/32/EC, 2005/33/EC and 2009/30/EC.

27.2.2.4 Reporting periods

• The fuel samples are not taken and tested during the transition period, the fuel samples are taken and tested only during summer period (from 1st May to 30th September) and only winter period (from 15th November to 28/29th February).

• Therefore only the results of fuel samples taken during the summer and the winter periods are reported within this annual fuel quality report

27.2.3 Compliance with Fuel Quality Limit Values

Table 27-3: Petrol Fuel Grades

Super 95 - Details of samples that exceed tolerance limits:					
Parameter	**Limit Value**	**Tolerance Limit* (TL)**	**Max/Min value of samples tested**	**No samples outside TL**	**% samples outside TL**
Research Octane Number	95	94.6	94.2	1	0.85%
Motor Octane Number	85	84.5	84.3	2	1.69%
Vapour Pressure	66	66.1	73.1	3	4.92%
Member State notes For RON and MON, the dealer was penalised by the Slovak Inspection of Environment (S.I.E).					
SuperPlus 98 - Details of samples that exceed tolerance limits:					
Parameter	**Limit Value**	**Tolerance Limit* (TL)**	**Max/Min value of samples tested**	**No samples outside TL**	**% samples outside TL**
Vapour Pressure	66	66.1	69	1	6.25%
Aromatics	35	37.2	36.5	1	3.23%
Member State notes For vapour pressure dealer was penalized by S.I.E. For Aromatics: Dealer was penalized by S.I.E.					

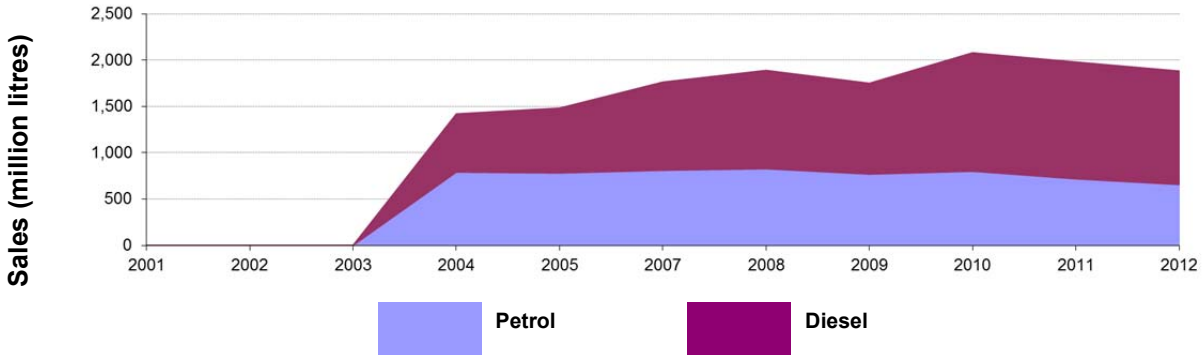
Table 27-4: Diesel Fuel Grades

Diesel - Details of samples that exceed tolerance limits:					
Parameter	**Limit Value**	**Tolerance Limit* (TL)**	**Max/Min value of samples tested**	**No samples outside TL**	**% samples outside TL**
Cetane number	51	48.5	48	1	0.85%
Distillation – 95-%-Point, °C	360	365.9	405	5	4.24%
Sulphur content, mg/kg	10	11.3	12	1	0.85%
FAME Content	7	7.3	8	1	0.85%
Member State notes For all non-compliant samples, the dealer was penalised by the Slovak Inspection of Environment (S.I.E).					

27.3 Temporal Trends

Figure 27-2 shows the overall trend in total fuel sales for Slovakia since 2004. Since 2004 there has been a gradual decrease in the amount of petrol fuel grade sold, whilst diesel sales have grown but fluctuated. Petrol sales since 2004 have fallen by 20.5% (134 million litres), and between 2011 and 2012 have fallen by 8.6% (62 million litres). Diesel sales since 2004 have grown by 48.6% (597 million litres), and between 2011 and 2012 have grown by 2.8% (35 million litres).

Figure 27-2: Temporal trends in national sales of petrol and diesel (million litres)



27.4 Statistical Analysis

The following charts in this section are known as box-plots and they display the distribution of fuel characteristics per Member State by illustrating the:

- Sample minimum
- Lower 25% range
- Middle 50% range
- Median
- Upper 25% range
- Maximum

For a full explanation of the information presented in a Box Plot diagram, please see Section 4 of the wider report.

Fuel sampling in Slovakia in 2012 recorded relatively few test results out of specification with limits (with 1.9% of petrol samples and 3.3% of diesel samples reported to be out of compliance). The analysis charts for petrol (Figure 27-3) and diesel (Figure 27-4) detail the distribution of sample results for the 5 selected parameters;

Petrol:

- Research Octane Number
- Motor Octane Number
- Summer Vapour Pressure

Diesel:

- Density at 15^{o}C
- Distillation – 95% v/v recovered

Sample results for these parameters have been depicted using box plots based on the reported sample minimum, lower quartile (Q1), median (Q2), upper quartile (Q3), and the maximum sample value.

27.4.1 Petrol Analysis

Sample results in 2012 have been presented in the following figures with limit values for the parameter (maximum or minimum) to demonstrate the skew of results. RON and MON sample results show that the fuels available in Slovakia have reasonably small variation in Octane levels, with RON 98 showing greater variability due to the sample size. RON 98 has

no non-compliant samples, whilst RON 95 is close to tolerance limits and has a few outliers on both the octane tests which were non-compliant.

Summer Vapour pressure results also show a tight distribution, again with a wider distribution for RON 98 due to sample size, but there are more outliers. RON 95 shows As Slovakia has reported that all fuels sold in 2012 contained up to a maximum of 10% biofuel content. Therefore, whilst the fuels exceed the limit value for summer vapour pressure, the samples all remained compliant with Directive specifications for vapour pressure in 2012.

Figure 27-3: Petrol analysis

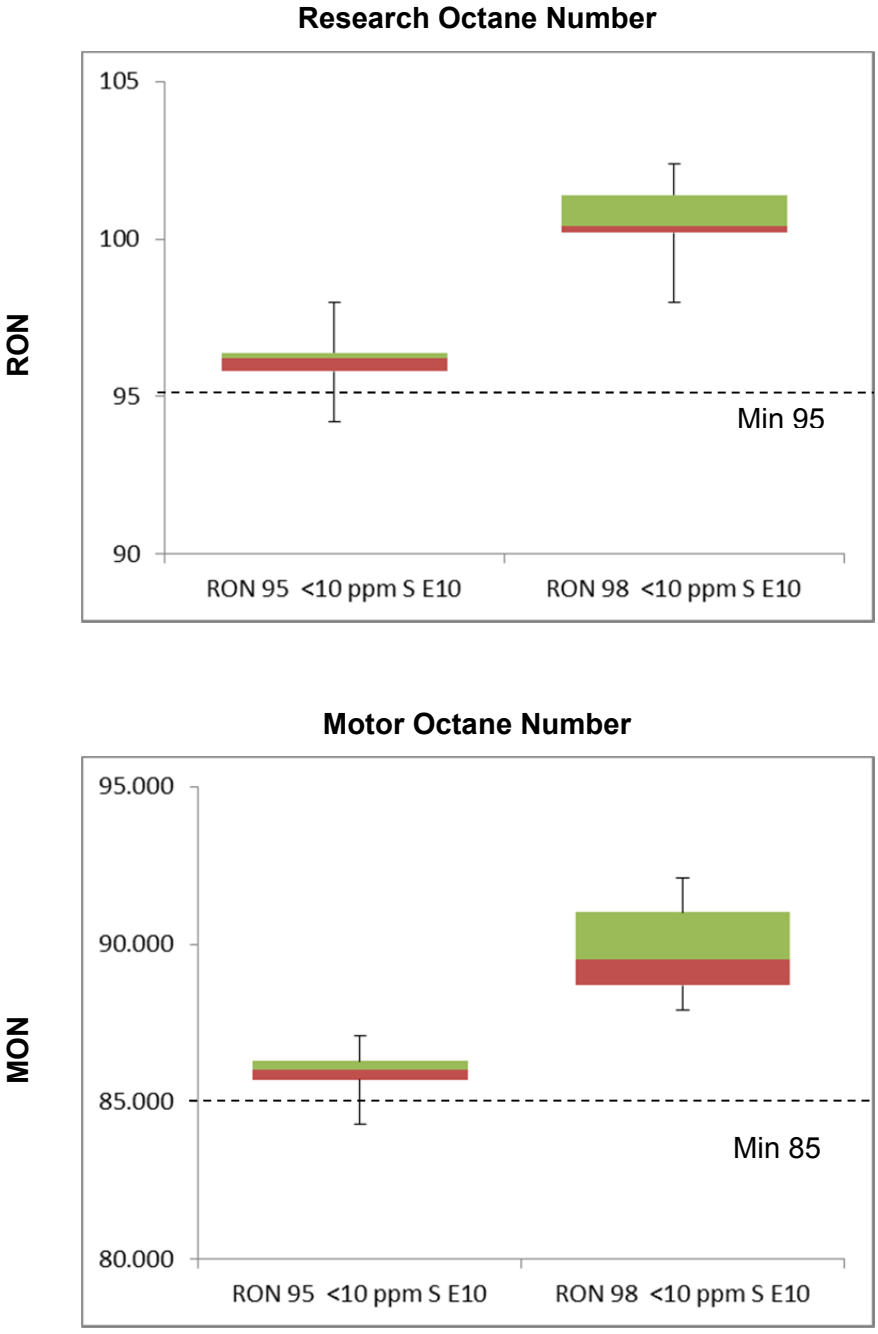
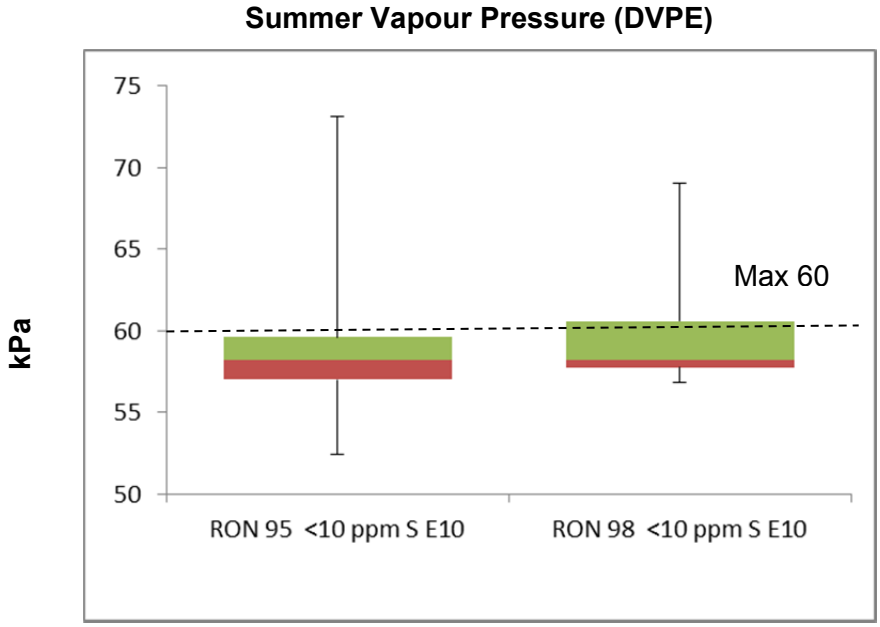


Figure 27-3: Petrol analysis (continued)



27.4.2 Diesel Analysis

Density at 15°C shows that the majority of results for diesel are tightly distributed – however there are some significant outliers.

Distillation similarly gives a much more skewed distribution, close to tolerance limits, with a number of outliers exceeding tolerance limits.

Figure 27-4: Diesel analysis

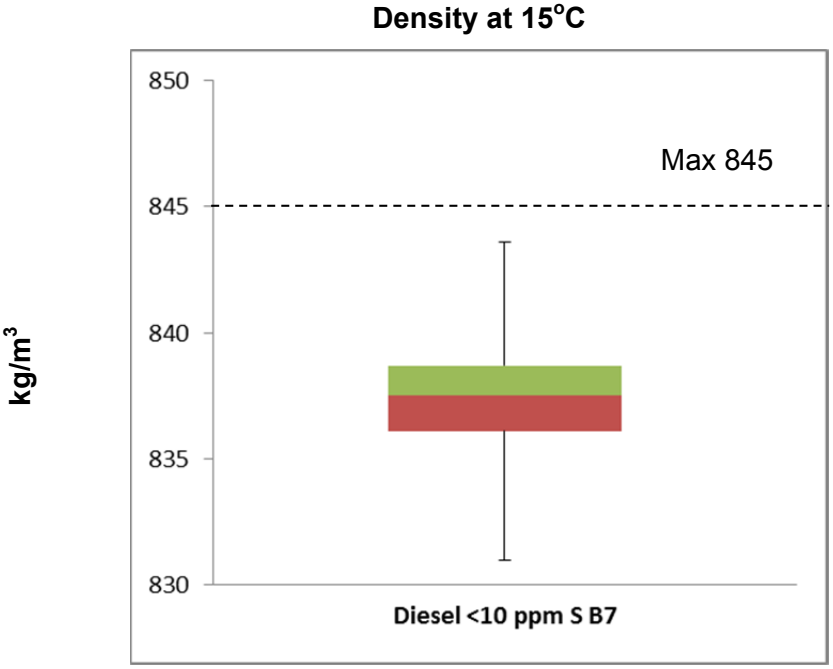
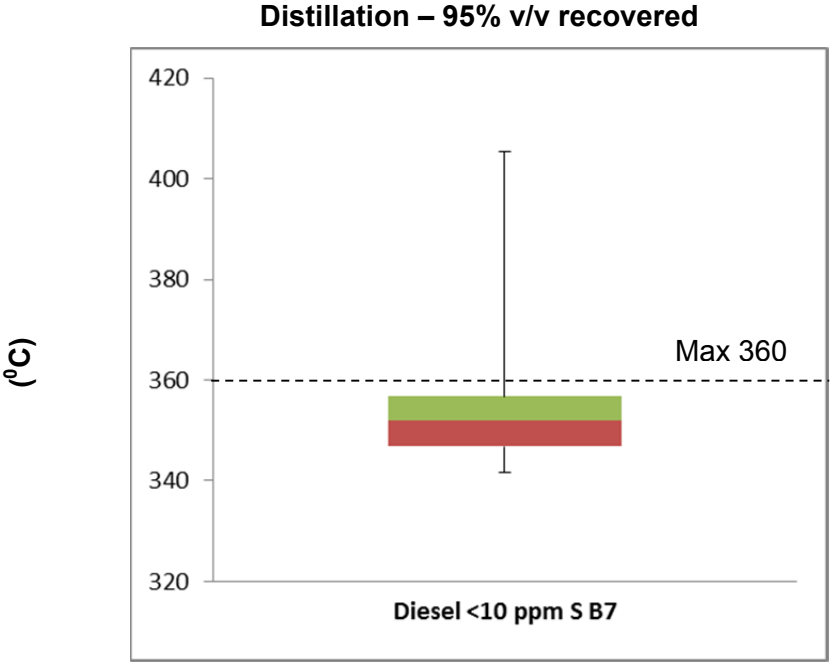


Figure 27-4: Diesel analysis (continued)



27.5 Key Areas for Improvement

The following table summarises the main areas in which improvements could be made to the monitoring system, reporting or compliance with Directive limit values. The table includes key recommendations from the previous year to give an assessment of what action has been taken by the Member State to address any issues that may have been highlighted.

Key Areas for Improvement (3 years)		
Year	**Monitoring**	**Reporting**
2012	• As in previous years, Slovakia has used EN 14274 Statistical Model C; however Model A may be more appropriate as outlined in EN 14274.	• The report was received on the 25th June, before the 30th June deadline.
2011	• As in previous years, Slovakia has used EN 14274 Statistical Model C; however Model A may be more appropriate as outlined in EN 14274. • Slovakia did not report parameter results for Manganese for any petrol grades in 2011.	• Report was received on time and all information was provided.
2010	• Slovakia uses EN 14274 Model C; however Model A may be more appropriate as outlined in EN 14274. • No description has been given of why statistical Model C is used in preference to Models A (recommended) or B (next preferred Model).	• No comment.

28 Slovenia

28.1 Fuel Availability 2012

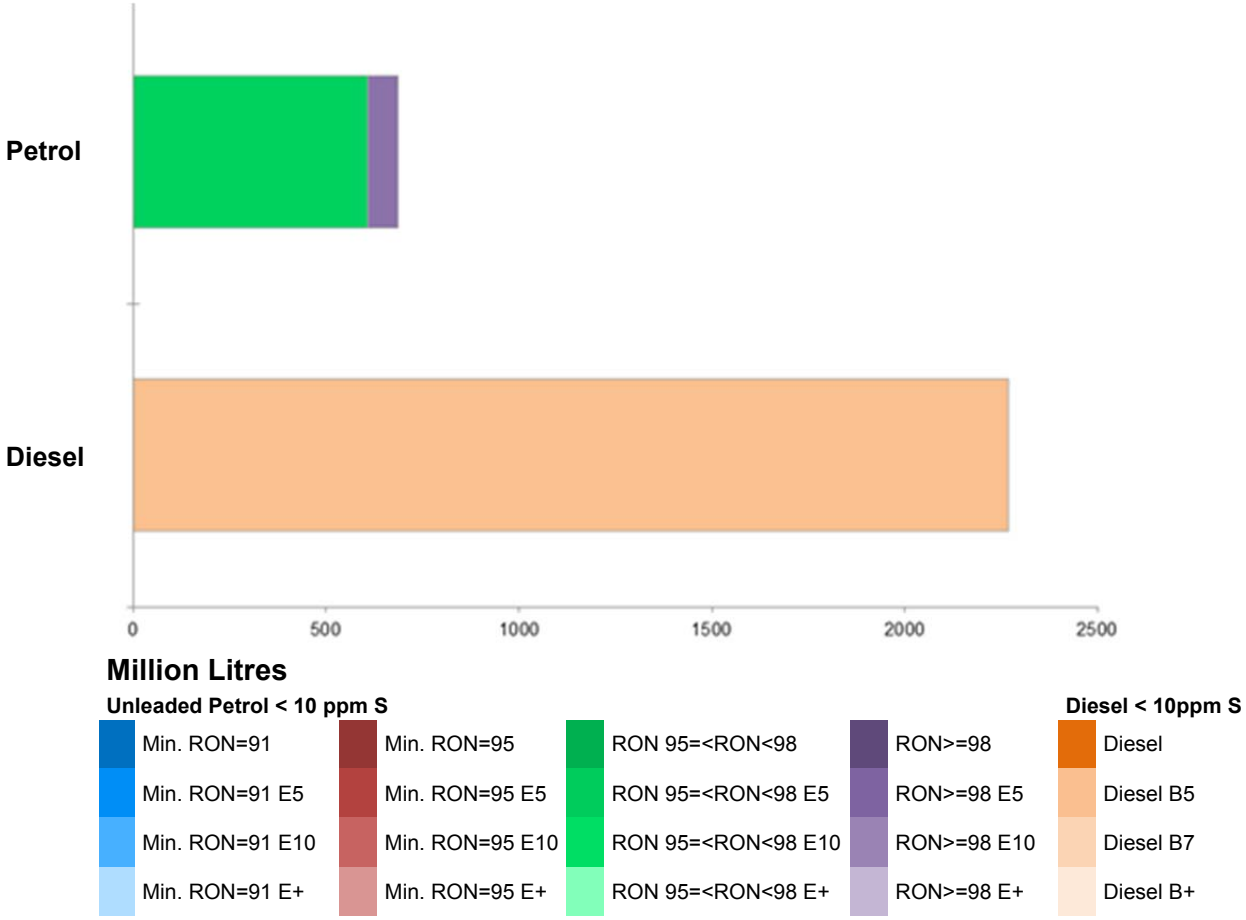
The following table lists the fuels that were reported to be available nationally in 2012.

Table 28-1: National fuel grade

Fuel grade	National fuel grade
Unleaded petrol (minimum 95 =< RON < 98) E5	NMB 95
Unleaded petrol (minimum RON >= 98) E5	NMB 98
Diesel fuel B5	B5

28.1.1 Sales, sampling and reporting

Figure 28-1: Fuel Sales proportions by fuel type



During 2012 fuel sales in Slovenia were dominated by diesel fuel sales; 2,270 million litres of diesel was sold in comparison to 686 million litres of petrol fuel sales (all petrol grades combined). 89% of petrol fuel sales were comprised of fuel grade Unleaded petrol (minimum 95 =< RON < 98) E5.

Table 28-2: Fuel sales and sampling

Fuel type (Parent Grade)	Sales (Million litres)	Sales, % total of fuel type	Samples (1) S	Samples (1) W	Samples (1) TR (2)	Separate S/W(3)	Parameters measured (4)	Add. Notes
Unleaded petrol 95=<RON<98 (<10 ppm S) E5	607	88.56%	63	64	50	Yes	18 of 19	(a)
Unleaded petrol RON>=98 (<10 ppm S) E5	78	11.44%	13	14	50	Yes	18 of 19	(a)
Total Petrol	**686**	**100.00%**	**76**	**78**	**100**	**Yes**	**18 of 19**	
Diesel (<10 ppm sulphur) B5	2,270	100.00%	64	98	50	Yes	6 of 6	
Total Diesel	**2,270**	**100.00%**	**64**	**98**	**50**	**Yes**	**6 of 6**	

(1)	Samples	The actual number of samples taken by the Member State in the summer (s) and winter (w) periods
(2)	TR	Total requirement per summer and winter period according to EN 14274. Brackets () show where a national model is being used, and the requirement is indicative to demonstrate equivalence with EN14274.
(3)	Separate S & W?	Yes indicates separate summer & winter reporting, and No indicates full year sample results reporting only.
(4)	Parameters measured	Currently 19 petrol parameters should be tested and reported by the Member States and 6 diesel parameters.
(a)	Additional notes	Manganese content was not reported in petrol samples.

28.1.1.1 Petrol Samples

Slovenia did not report sufficient sampling quantities for petrol RON>=98 E5. For small Member States using statistical model C, the minimum sampling quantity per period is 50.

28.1.1.2 Diesel Samples

Diesel fuel samples tested in 2012 exceeded the total minimum requirement of 50 samples per summer and winter period.

28.2 Fuel Quality Monitoring 2012

28.2.1 Description of System

Responsible organisation(s)	Slovenian Environment Agency
Fuel Quality Monitoring System (FQMS)	EN 14274 Statistical Model C
Country Size	Small
Summer Period	Normal
Location(s) of sampling	Service stations and depots.
Time/frequency of sampling	Samples have been taken throughout the year for diesel and petrol.

Specification of test methods	All parameters except manganese (MMT) which were specified in Directive 98/70/EC 1998 relating to the quality of petrol and diesel fuels, and last amended by Directive 2009/30/EC, were analysed in petrol and diesel fuels samples. According to the annual reports of monitoring bodies few exceedances of Directive 2009/30/EC limit values were observed in 2012 for S and vapour pressure (95% Point) in diesel fuel, however the maximum values found were still inside a measuring uncertainty of the method applied. The information on the fuel quality monitoring was currently (3-monthly) delivered to the Inspectorate of the Environment of the Republic of Slovenia. According to the national legislation which transposes the Directive 2009/30/EC, the distributors would be penalised in case of any exceedance.
Collection of sales data	Sales data collection for 2012 was provided by Slovenian Environment Agency, a part of the Ministry of Agriculture and the Environment that receives annual reports from fuel distributors as well as a summary for all distributors from two accredited agencies (Monitoring bodies) responsible/nominated for quality control and reporting of these data. Each Monitoring body and selected distributors are connected by contracts according to national legislation.

Other details

All parameters except manganese (MMT), which were specified in Directive 98/70/EC 1998 relating to the quality of petrol and diesel fuels, and last amended by Directive 2009/30/EC, were analysed for petrol and diesel fuels samples in 2012. According to the annual reports of monitoring bodies no exceedances of Directive 2009/30/EC limit values were observed in 2012 for Sulphur and vapour pressure (95% Point) in diesel fuel, however the maximum values found were still inside a measuring uncertainty of the method applied. The information on the fuel quality monitoring was currently (in 3-month intervals) delivered to the Inspectorate of Agriculture and the Environment of the Republic of Slovenia. According to the national legislation which transposes the Directive 2009/30/EC, the distributors would be penalised in case of any exceedance.

28.2.2 Fuel Quality Monitoring System

28.2.2.1 Sampling

The fuel quality monitoring system in Slovenia is based on the European Standard EN 14274:2003, utilising statistical model C (small country).

The Environment Agency provide 3-monthly and annual reports from two independent inspection bodies responsible for the sampling plan; carrying out the sampling and analysis of fuel samples, and collecting and processing the data. They are accredited by the Slovenian Accreditation inspection body according to EN ISO/IEC 17020:2004. The analyses of samples are carried out by testing laboratories accredited according to EN ISO/IEC 17025:2005.

The test methods were in compliance with the Directive specifications, except for determination of cetane number. Validation and traceability of the cetane number method was provided according to EN ISO/IEC 17025:2005.

28.2.2.2 FQMS administration

The Ministry of Agriculture, the Ministry of the Environment and the Environment Agency are responsible for the administration of FQMS.

28.2.2.3 National Legislation that transposed the FQD

The Fuel Quality Directive have been transposed to Slovenian legislation in 2011 and implemented from October 1st, 2011 by the Decree on Physico-chemical properties of Liquid Fuels (Official Gazette of the Republic of Slovenia, No. 74/23, 9. 2011).

28.2.2.4 Reporting periods

Seasonal periods in Slovenia are as follows: Summer: from May the 1st to September the 30st; winter: from October the 1st to April the 30srt. No Arctic (and any other) derogation have been granted so far. Samples were taken and tested regardless to the transition periods and analysis results were reported throughout the year according to the national legislation.

28.2.3 Compliance with Fuel Quality Limit Values

Table 28-3: Petrol Fuel Grades

MNB95 (RON (min 95 =< RON < 98) E5)- Details of samples that exceed tolerance limits:					
Parameter	**Limit Value**	**Tolerance Limit* (TL)**	**Max/Min value of samples tested**	**No samples outside TL**	**% samples outside TL**
Sulphur content (mg/kg)	10	11.8	12.4	2	1.57%
Member State notes No information provided about action taken for samples that exceeded tolerance limits					
NMB98 (Unleaded petrol (minimum RON >= 98) E5)- Details of samples that exceed tolerance limits:					
Parameter	**Limit Value**	**Tolerance Limit* (TL)**	**Max/Min value of samples tested**	**No samples outside TL**	**% samples outside TL**
Aromatics (% V/V)	35	36	36.1	2	7.4%
Member State notes No information provided about action taken for samples that exceeded tolerance limits					

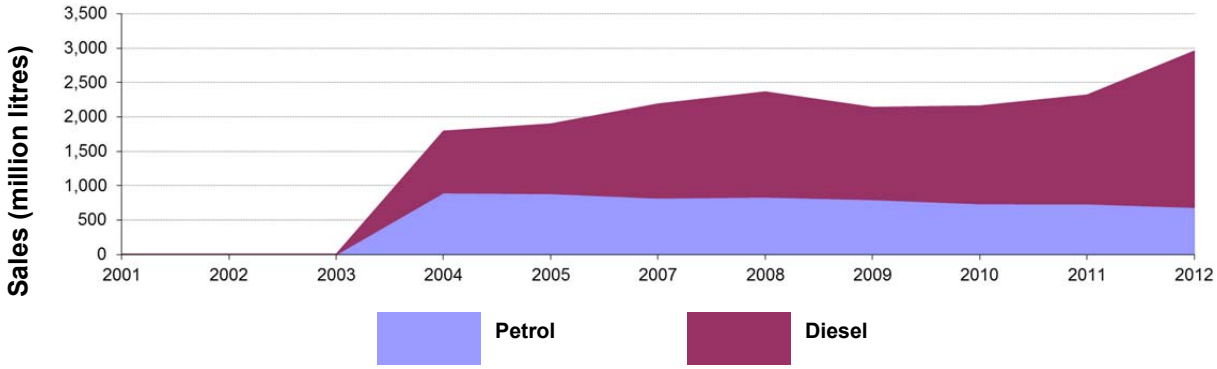
Table 28-4: Diesel Fuel Grades

Diesel - Details of samples that exceed tolerance limits:					
Parameter	**Limit Value**	**Tolerance Limit* (TL)**	**Max/Min value of samples tested**	**No samples outside TL**	**% samples outside TL**
Sulphur content	10	11.3	12.1	1	0.62
FAME	7	7.3	10.7	3	1.85
Member State notes No information provided about action taken for samples that exceeded tolerance limits					

28.3 Temporal Trends

Figure 28-2 shows the trend in total fuel sales since 2004. Diesel sales in Slovenia have fluctuated since 2004, but have increased by 1,376 million litres (60.6%) up to 2012, in the period 2011 to 2012 sales grew by 690 million litres (43.7%). Petrol sales have gradually decreased since 2004; by 211 million litres (30.8%) from 2004 to 2012 and by 51 million litres (6.9%) in the period 2011 to 2012.

Figure 28-2: Temporal trends in national sales of petrol and diesel (million litres)



28.4 Statistical Analysis

The following charts in this section are known as box-plots and they display the distribution of fuel characteristics per Member State by illustrating the:

- Sample minimum
- Lower 25% range
- Middle 50% range
- Median
- Upper 25% range
- Maximum

For a full explanation of the information presented in a Box Plot diagram, please see Section 4 of the wider report.

The analysis charts for petrol (Figure 13-3) and diesel (Figure 13-4) detail the distribution of sample results for the 5 selected parameters;

Petrol:

- Research Octane Number
- Motor Octane Number
- Summer Vapour Pressure

Diesel:

- Density at 15^{o}C
- Distillation – 95% v/v recovered

Sample results for these parameters have been depicted using box plots based on the reported sample minimum, lower quartile (Q1), median (Q2), upper quartile (Q3), and the maximum sample value.

28.4.1 Petrol Analysis

Analysis of the samples for octane levels through the RON and MON analysis show an even spread for RON, whilst MON analysis shows a skew of results away from tolerance limits. RON 95 remains close the tolerance limits for MON and has a few outliers which exceed tolerance limits, whilst for RON the analysis reveals outliers are far from the norm of the samples taken.

There is a fairly even distribution of summer vapour pressure samples, with only a few outliers exceeding tolerance limits.

Figure 28-3: Petrol analysis

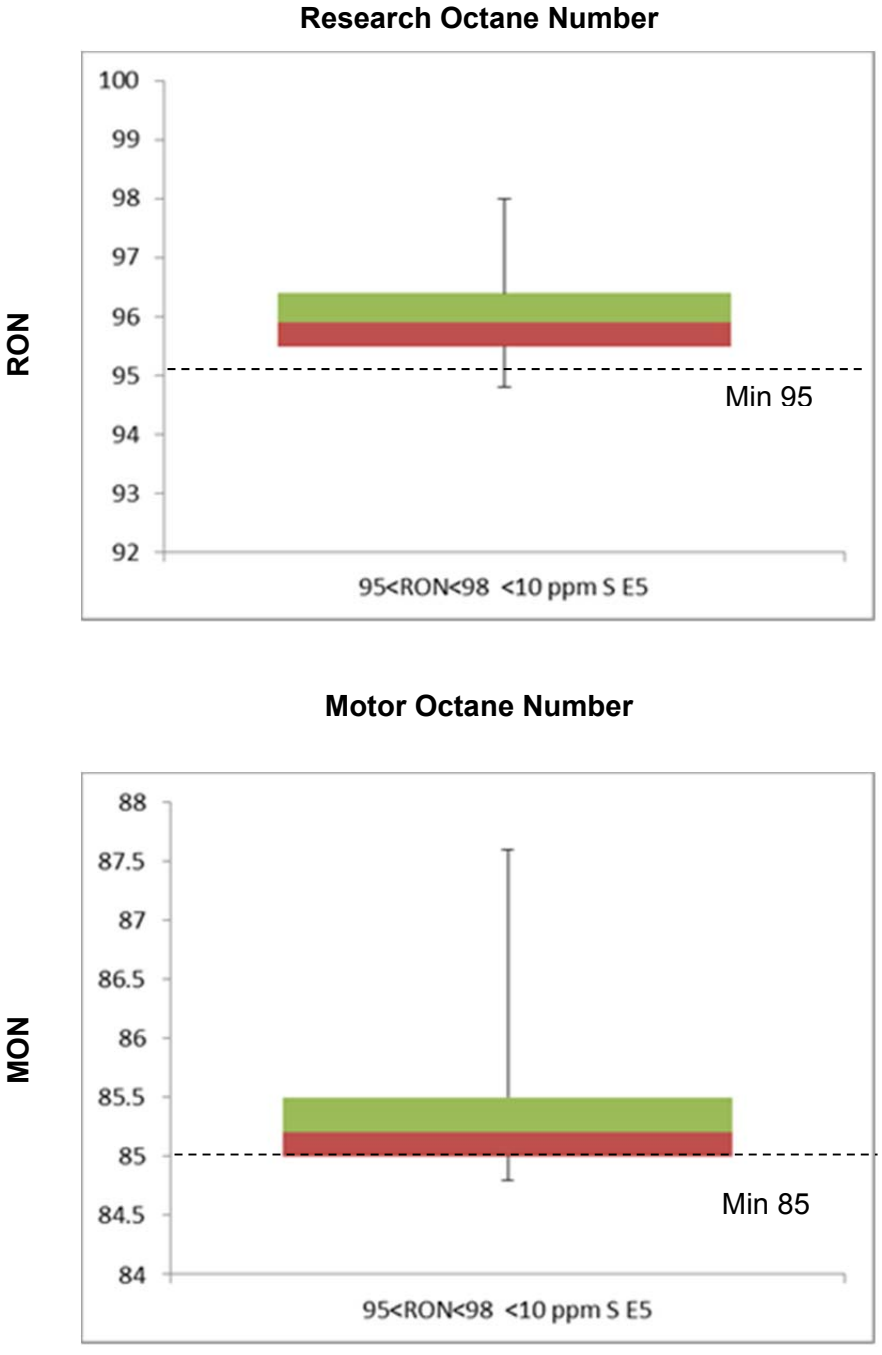
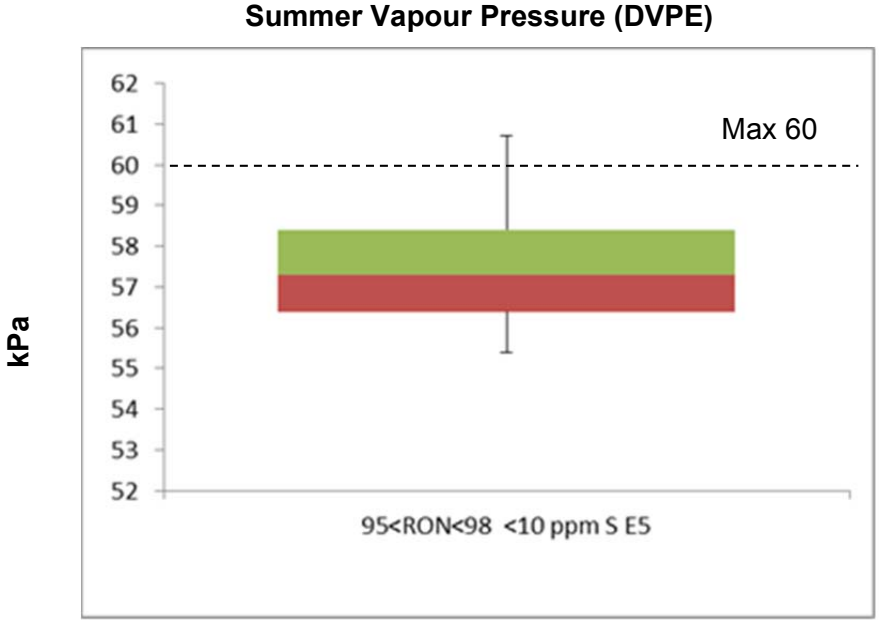


Figure 28-3: Petrol analysis (continued)



28.4.2 Diesel Analysis

Samples for density and distillation are distributed evenly more evening for density than distillation, however both show a distribution which not near tolerance limits, with no outliers that are non-compliant.

Figure 28-4: Diesel analysis

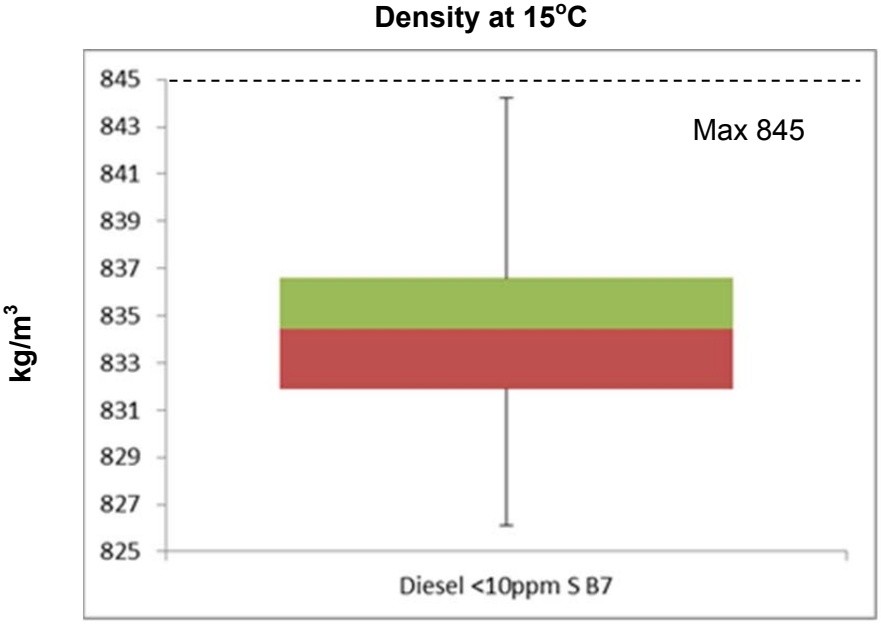
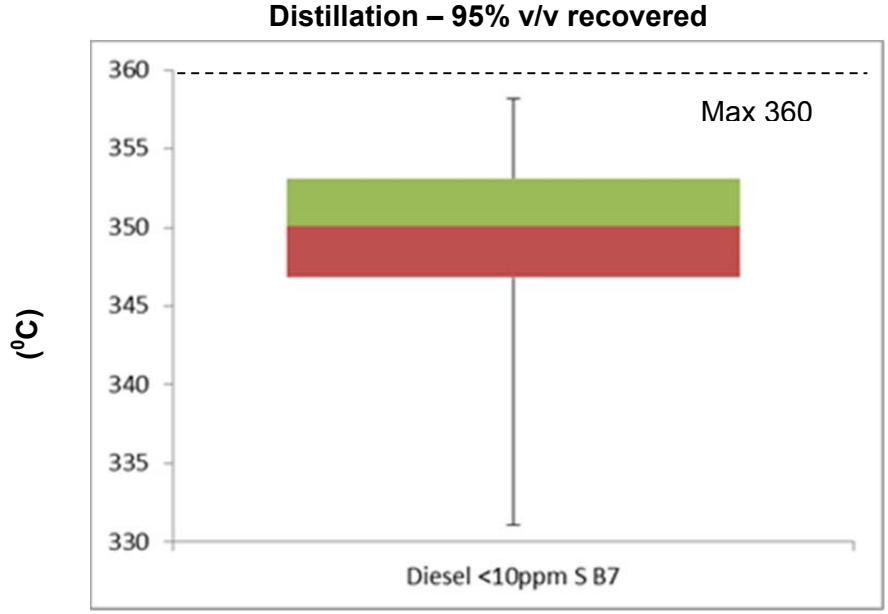


Figure 28-4: Diesel analysis (continued)



28.5 Key Areas for Improvement

The following table summarises the main areas in which improvements could be made to the monitoring system, reporting or compliance with Directive limit values. The table includes key recommendations from the previous year to give an assessment of what action has been taken by the Member State to address any issues that may have been highlighted.

Key Areas for Improvement (3 years)		
	Monitoring	**Reporting**
2012	Slovenia did not report parameter results for Manganese content for petrol samples in 2012. Slovenia did not report sufficient sampling quantities for petrol RON>=98 E5.	The 2012 report was received on the 25th of June, well before the deadline of 30th June.
2011	Slovenia did not report parameter results for Manganese content for petrol samples or FAME content for diesel fuel samples in 2011. Slovenia did not report sufficient sampling quantities for petrol RON>=98 E5.	The 2011 report was submitted within the Member State deadline.
2010	• No comment	Slovenia has not provided additional detail requested about parameter sample group results. This has been explained as a result of old versions of the reporting template having been used by monitoring bodies for 2010. Sample quantities in the sales data sheet do not match completely those reported in the parameter results tables of the reporting template.

29 Spain

29.1 Fuel Availability 2012

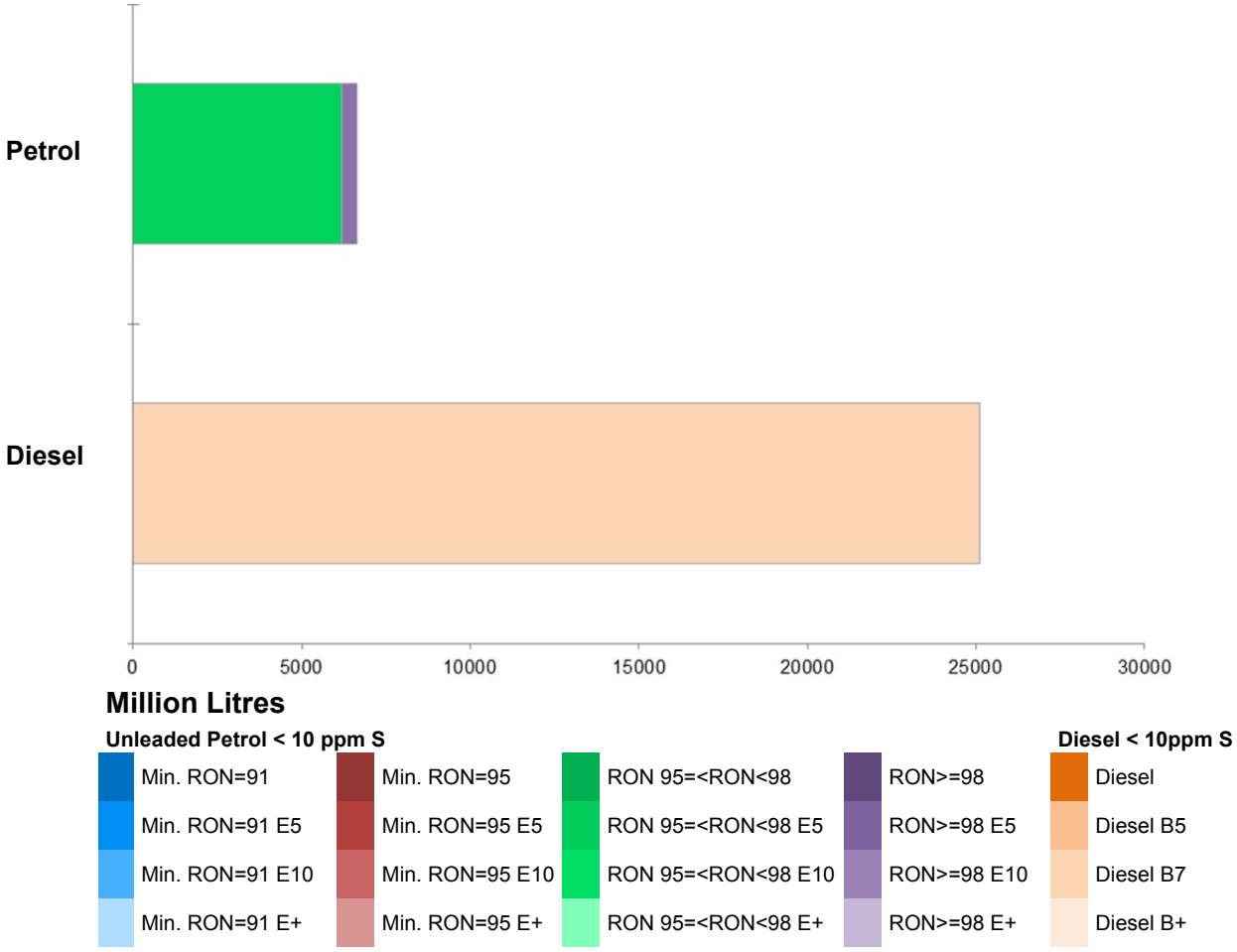
The following table lists the fuels that were reported to be available nationally in 2012.

Table 29-1: National fuel grade

Fuel grade	National fuel grade
Unleaded petrol (minimum 95 =< RON < 98) E5	Gasolina 95
Unleaded petrol (minimum RON >= 98) E5	Gasolina 98
Diesel fuel B7	Gasóleo A

29.1.1 Sales, sampling and reporting

Figure 29-1: Fuel Sales proportions by fuel type



During 2012 fuel sales in Spain were heavily dominated by diesel fuel sales; 25,111 million litres of diesel with up to 7% biofuel content was sold in comparison to more than 6,658 million litres of petrol fuel sales (all petrol grades combined). Petrol fuel sales were mainly comprised of fuel grade RON 95 (with up to 5% biofuel content) with only 7.3% of petrol fuel sales RON 98 (with up to 5% biofuel content).

Table 29-2: Fuel sales and sampling

Fuel type (Parent Grade)	Sales (Million litres)	Sales % total of fuel type	Samples (1) S	Samples (1) W	Samples (1) TR (2)	Separate S/W(3)	Parameters measured (4)	Add. Notes
Unleaded petrol 95=<RON<98 (<10 ppm S) E5	6,170	92.68%	165	231	100	Yes	19 of 19	
Unleaded petrol RON>=98 (<10 ppm S) E5	487	7.32%	160	224	15	Yes	19 of 19	
Total Petrol	**6,658**	**100.00%**	**325**	**455**	**115**	**Yes**	**19 of 19**	
Diesel (<10 ppm sulphur) B7	25,111	100.00%	198	198	100	Yes	6 of 6	
Total Diesel	**25,111**	**100.00%**	**198**	**198**	**100**	**Yes**	**6 of 6**	

(1)	Samples	The actual number of samples taken by the Member State in the summer (s) and winter (w) periods
(2)	TR	Total requirement per summer and winter period according to EN 14274. Brackets () show where a national model is being used, and the requirement is indicative to demonstrate equivalence with EN14274.
(3)	Separate S & W?	Yes indicates separate summer & winter reporting, and No indicates full year sample results reporting only.
(4)	Parameters measured	Currently 19 petrol parameters should be tested and reported by the Member States and 6 diesel parameters. Spain has reported results for all parameters in all fuel grades.

29.1.1.1 Petrol Samples

Spain has complied with or exceeded minimum sampling requirements for all petrol fuel grades.

29.1.1.2 Diesel Samples

Spain has complied with or exceeded minimum sampling requirements for all diesel fuel grades.

29.2 Fuel Quality Monitoring 2012

29.2.1 Description of System

Responsible organisation(s)	Directorate General for Energy Policy and Mines. Ministry of Industry, Energy and Tourism
Fuel Quality Monitoring System (FQMS)	EN14274 Statistical model A.
Country Size	Large
Summer Period	Normal
Location(s) of sampling	Samples taken at terminals. Samples are taken from storage tanks at atmospheric pressure according ISO 3170:2004 at or near atmospheric pressure.

Time/frequency of sampling	As an average, around 30 samples are taken for product and month. Samples have being taken during the transition periods of the current year. So, Spain's 2012 report will include these data.
Specification of test methods	Spain have since confirmed that all test methods in all samples have been those in EN:228. The only exception is the test for hydrocarbon content because the test specified in EN:228 (EN 14517) is obsolete, so for these tests, the actualised method EN 22854 has been used.
Collection of sales data	Oil Operators are obliged to provide monthly sale data to the Spanish Administration on the domestic market according to the procedure and forms approved by Resolution from the Directorate General for Energy Policy and Mining, dated 29th May 2007. This information is analysed, checked and compiled for two main purposes: verifying compliance with the Spanish regulations, namely emergency oil stocks and statistics. Statistics are published with information about the exact sales for each month and consolidated for each year. According to statistics corresponding to year 2012, you will see that sales of unleaded petrol 95O accounted for 4,557 kt (aprox. 6,170 million litres), unleaded petrol 98O 360 kt (aprox. 487 million litres) and diesel 21,240 kt (aprox. 25,111 million litres).

Other details: Spain employs differing summer and winter periods for petrol and diesel fuels. The periods for gasoline are: summer from May 1 through September 30 and winter from October 1 through April 30. The periods for gas oils are summer from April 1 through September 30 and winter from 1 October to 31 March.

It is mandatory for fuels that contain metallic additives to be labelled at the pump in Spain. According to the RD 1088/2010 of September 3; "if you incorporate these gasoline additives, it shall be labelled indicating "Contains metallic additives". '" as per the requirement in the Directive.

In the case of gasoline with more than 5 per cent by volume of ethanol and more than 2.7 per cent by mass of oxygen, retailers are required to inform the consumer with the following signage: "Before using this product make sure it is suitable for your engine". In the case of fuels with more than 7 per cent by volume biodiesel, the percentage of biodiesel contained in the product should be indicated, plus the following signage: "Before using this product make sure it is suitable for your engine."

29.2.2 Fuel Quality Monitoring System

29.2.2.1 Sampling

Samples were taken at terminals. As an average, around 30 samples are taken for product and months. Samples are taken from storage tanks at atmospheric pressure according ISO 3170:2004 at or near atmospheric pressure.

29.2.2.2 FQMS administration

The Ministry of Industry, Energy and Tourism is responsible for FQMS administration. The pipe network and the majority of fuel storages are jointly operated under TPA regime. The products are commingled to optimise the physical flows. This procedure enhances reliability

and coherence in methodology and reporting, and is fully compliant with article 8.2 of Directive 98/70/EC.

29.2.2.3 National Legislation that transposed the FQD

Fuel Quality specification is transposed into Spanish law in Real Decrero RD 61/2006 and RD 2088/2010

Sampling and analysis transposed in Art. 7 of RD 61/2006

29.2.2.4 Reporting periods

Spain employs differing summer and winter periods for petrol and diesel fuels:

Diesel: winter from 01-10 to 30-03. Summer from 01-04 to 30-09.

Gasoline: winter from 01-10 to 30-04. Summer from 01-05 to 30-09

29.2.3 Compliance with Fuel Quality Limit Values

Table 29-3: Petrol Fuel Grades

Gasolina 95 and Gasolina 98 – Details of samples that exceed tolerance limits:
No samples were found to be out of compliance.

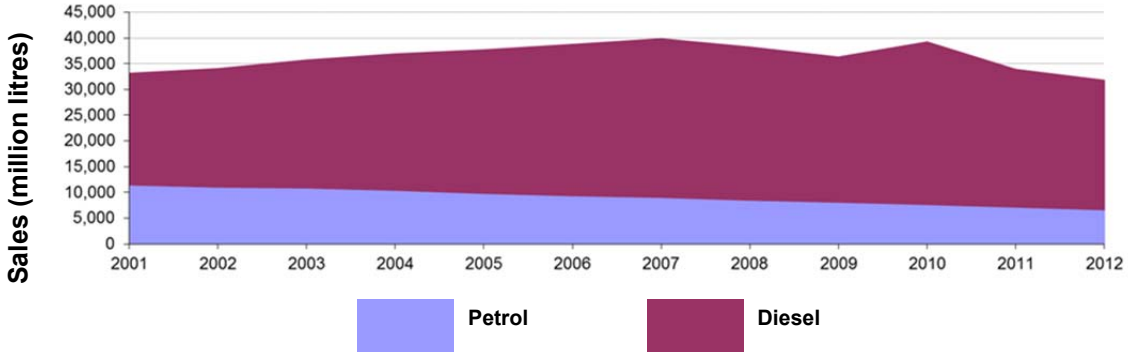
Table 29-4: Diesel Fuel Grades

Diesel - Details of samples that exceed tolerance limits:
No samples were found to be out of compliance.

29.3 Temporal Trends

Figure 29-2 shows the trend in total fuel sales since 2001. Diesel sales have fluctuated from 2001 to 2012, but have increased by 3,470 million litres (13.8%), whilst petrol sales have gradually decreased by 4,824 million litres (72.5%). In the period 2011 to 2012 petrol sales decreased by 509 million litres (7.1%), whilst diesel sales increased by 1,601 million litres (6%).

Figure 29-2: Temporal trends in national sales of petrol and diesel (million litres)



29.4 Statistical Analysis

The charts intended for this section are known as box-plots and they display the distribution of fuel characteristics per Member State by illustrating the:

- Sample minimum
- Lower 25% range
- Middle 50% range

- Median
- Upper 25% range
- Maximum

For a full explanation of the information presented in a Box Plot diagram, please see Section 4.

Fuel sampling in Spain in 2012 recorded no test results were found to be out of specification with limit values. The analysis charts for petrol (Figure 29-3) and diesel (Figure 29-4) detail the distribution of sample results for the 5 selected parameters:

Petrol:

- Research Octane Number
- Motor Octane Number
- Summer Vapour Pressure

Diesel:

- Density at 15^{o}C
- Distillation – 95% v/v recovered

Sample results for these parameters have been depicted using box plots based on the reported sample minimum, lower quartile (Q1), median (Q2), upper quartile (Q3), and the maximum sample value.

29.4.1 Petrol Analysis

Sample results in 2012 have been presented in the following figures with limit values for the parameter (maximum or minimum) to demonstrate the skew of sample results.

All RON, MON and DVPE samples remained within tolerance limits for the parameters analysed. Typically, RON and MON remain fairly tight to specification with narrow bands showing where the majority of samples lie and small variation in outliers.

Summer Vapour pressure results show a wider variation of samples, shown by the widely spread coloured bands and are skewed close to specifications with the majority (75%) of samples close to the 60kPa limit value for the parameter.

Figure 29-3: Petrol analysis

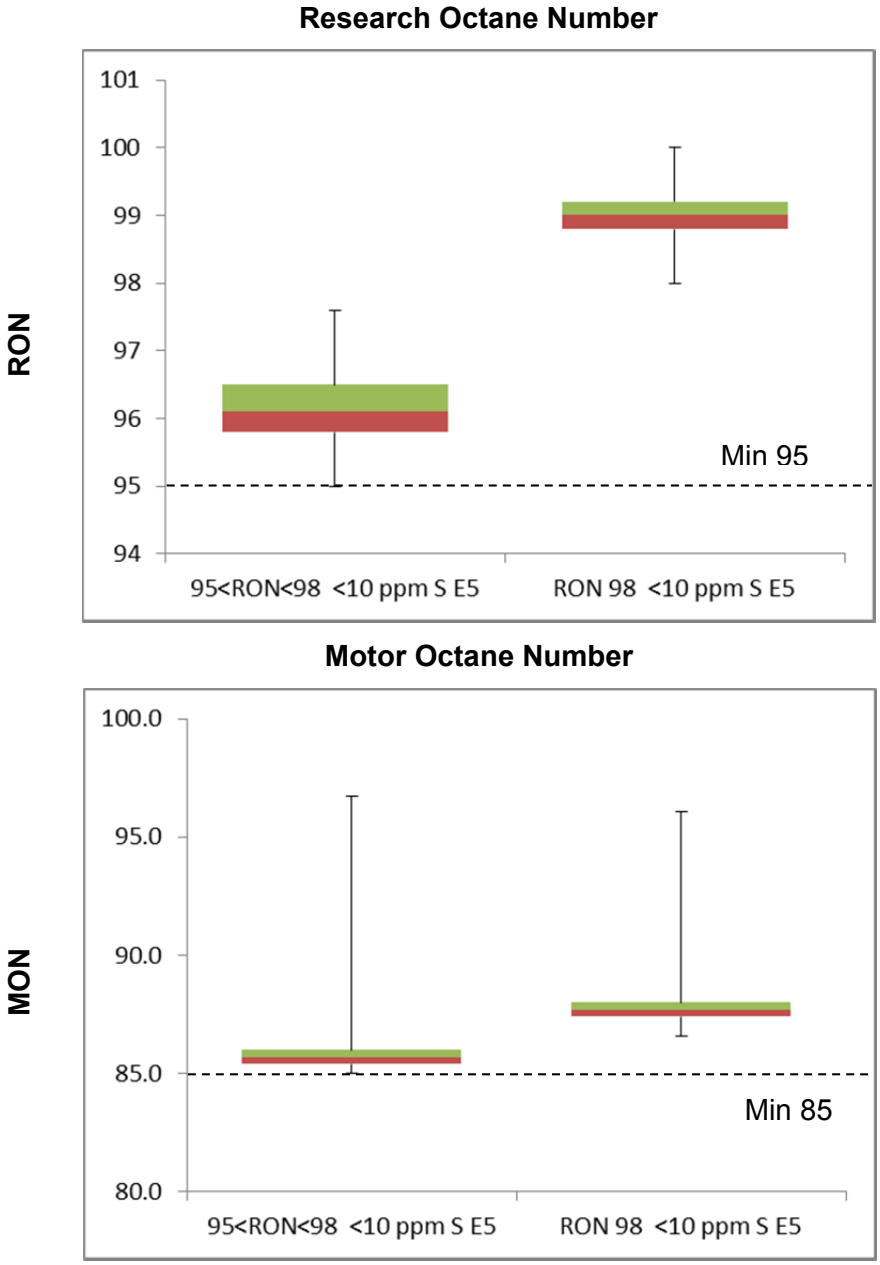
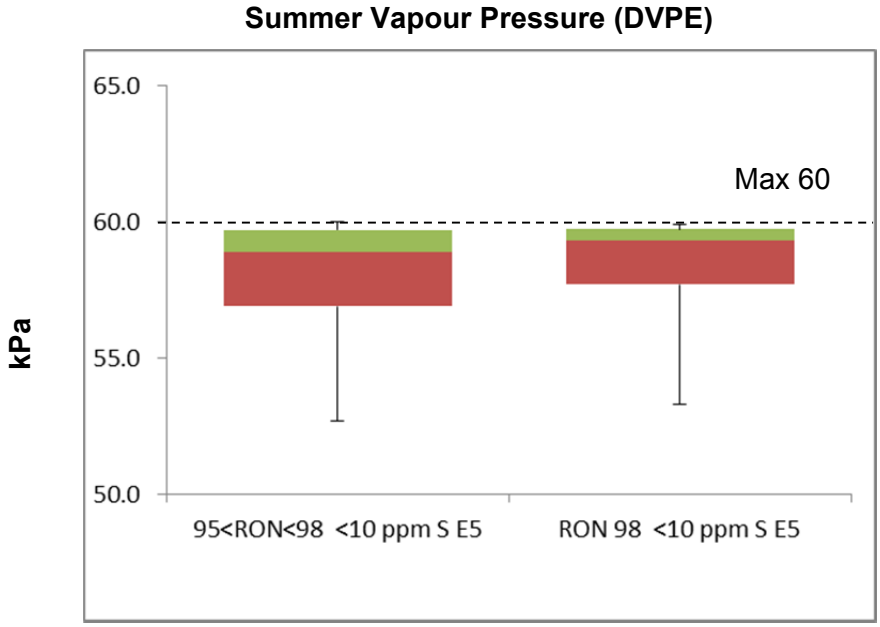


Figure 29-3: Petrol analysis (continued)



29.4.2 Diesel Analysis

No samples reportedly exceeded tolerance limits for the parameters; and both sets of values remained within limit values for the parameters analysed. Similar to petrol fuel results reported for Spain in 2012, parameter test results are tight to specifications.

Figure 29-4: Diesel analysis

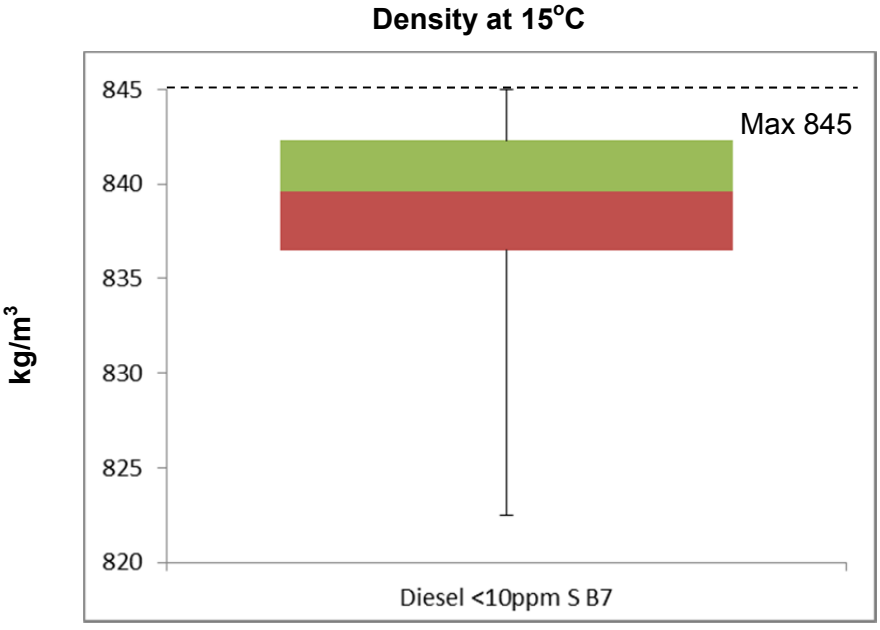
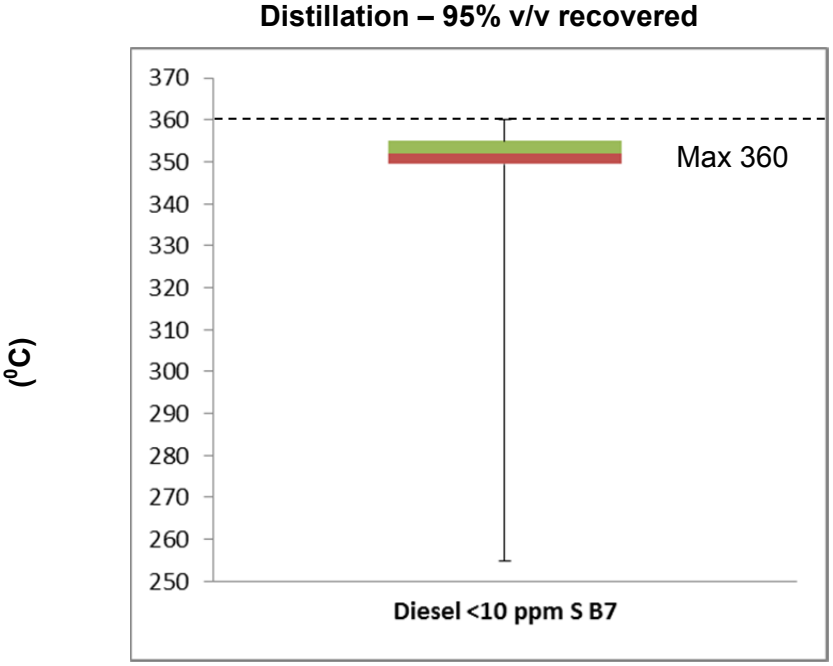


Figure 29-4: Diesel analysis (continued)



29.5 Key Areas for Improvement

The following table summarises the main areas in which improvements could be made to the monitoring system, reporting or compliance with Directive limit values. The table includes key recommendations from the previous year to give an assessment of what action has been taken by the Member State to address any issues that may have been highlighted.

Key Areas for Improvement (3 years)		
	Monitoring	**Reporting**
2012	• No comments	The report was received on the 1 August, after the 30 June deadline.
2011	• No detail has been provided about whether test methods comply with those specified in the Directive. • No additional detail has been provided about the collection of sales data in 2011.	Report was received on time and all information was provided.
2010	• Samples numbers in each summer and winter period should demonstrate equivalence with samples required for a large country in EN 14274; a minimum of 100 samples from service stations per summer period and per winter period. Summer sampling in Spain is less than 100.	The 2010 report was submitted after the official report submission deadline of 30th June 2011. The 2010 Spanish report was initially submitted by Fax and not as an electronic copy. The report was submitted in a National format and not using the

Key Areas for Improvement (3 years)	
Monitoring	**Reporting**
• Spain has not confirmed the location from which samples have been taken in 2010. International Standard EN 14274 gives the minimum number of fuel dispensing sites to be sampled. Any terminal and refinery sampling must be carried out in addition to samples at point of use (service stations). As Spain has not provided sample location; it is impossible to determine sample compliance.	EU approved reporting template. Additional detail requested to enable statistical analysis of results has not been provided for 2010.

30 Sweden

30.1 Fuel Availability 2012

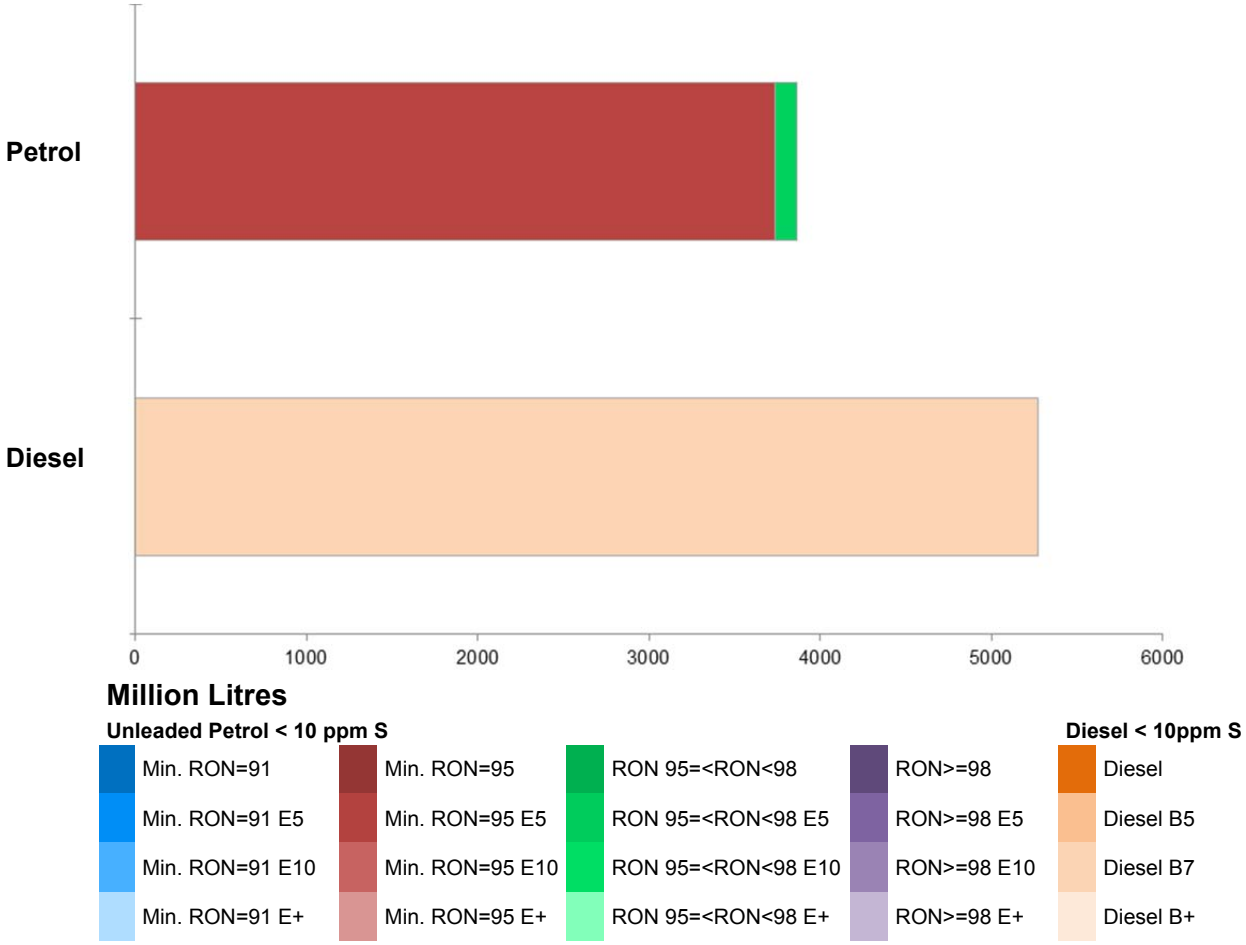
The following table lists the fuels that were reported to be available nationally in 2012.

Table 30-1: National fuel grade

Fuel grade	National fuel grade
Unleaded petrol (minimum RON = 95) E5	Unleaded 95
Unleaded petrol (minimum 95 =< RON < 98) E5	Unleaded 98
Diesel fuel B5	Environmental class 1 diesel

30.1.1 Sales, sampling and reporting

Figure 30-1: Fuel Sales proportions by fuel type



During 2012 fuel sales in Sweden were predominantly led by diesel fuel sales; 5,273 million litres of diesel was sold in comparison to 3,863 million litres of petrol fuel sales (all petrol grades combined). Petrol fuel sales were mainly comprised (96.8%) of fuel grade RON 95.

Table 30-2: Fuel sales and sampling

Fuel type (Parent Grade)	Sales (Million litres)	Sales, % total of fuel type	Samples (1) S	Samples (1) W	Samples (1) TR (2)	Separate S/W(3)	Para-meters measured (4)	Add. Notes
Unleaded petrol min. RON=95 (<10 ppm S) E5	3,738	96.77%	282	273	(50)	Yes	13 of 19	(a)
Unleaded petrol 95=<RON<98 (<10 ppm S) E5	125	3.23%	54	22	(2)	Yes	13 of 19	(a)
Total Petrol	**3,863**	**100.00%**	**336**	**295**	**(52)**	**Yes**	**13 of 19**	
Diesel (<10 ppm sulphur) B5	5,273	100.00%	351	366	(50)	No	5 of 6	(b)
Total Diesel	**5,273**	**100.00%**	**351**	**366**	**(50)**	**No**	**5 of 6**	

(1)	Samples	The actual number of samples taken by the Member State in the summer (s) and winter (w) periods
(2)	TR	Total requirement per summer and winter period according to EN 14274. Brackets () show where a national model is being used, and the requirement is indicative to demonstrate equivalence with EN14274.
(3)	Separate S & W?	Yes indicates separate summer & winter reporting, and No indicates full year sample results reporting only.
(4)	Parameters measured	Currently 19 petrol parameters should be tested and reported by the Member States and 6 diesel parameters.
	Additional notes	
	a)	For petrol fuel grades, sample tests were not reported on parameters methanol, ethanol, iso-propyl alcohol, tert-butyl alcohol, iso-butyl alcohol and other oxygenates.
	b)	For diesel fuel grades, sample tests were not reported on parameter FAME content.

30.1.1.1 Petrol Samples

Sweden did the required number of samples for all petrol fuel grades for a country classified as 'small'. Only terminals were sampled; sampling requirements require service stations to be sampled.

30.1.1.2 Diesel Samples

Sweden did the required number of samples for diesel for a country classified as 'small'. Only terminals were sampled; sampling requirements require service stations to be sampled.

30.2 Fuel Quality Monitoring 2012

30.2.1 Description of System

Responsible organisation(s)	The Swedish Petroleum and Biofuels Institute
Fuel Quality Monitoring System (FQMS)	National System

Country Size	Small
Summer Period	Arctic
Location(s) of sampling	Terminals
Time/frequency of sampling	As in previous years, sampling has been carried out in both the summer and winter periods.
Specification of test methods	No details have been provided.
Collection of sales data	No details have been provided.
Other details	

30.2.2 Fuel Quality Monitoring System

30.2.2.1 Sampling

The Swedish Petroleum and Biofuels Institute compiles the data for this annual Fuel Quality Monitoring Report. The quality assessment system consists of a compilation of quality data of all batches produced in Sweden for the Swedish market and also all import batches for the Swedish market. The reported data represents more than 98% of the sales of petrol and diesel in Sweden. The analyses are done according to standardized analysis methods. The Swedish Transport Agency sends the report to the European Commission.

In 2012, The Swedish Transport Agency, as a control of the national system, carried out tests by an accredited test laboratory. The tests included random sampling from actual fuel dispensing sites and subsequent analysis of the samples according to the same test methods as in this submission. The samples from the actual fuel dispensing sites showed full equivalency for both petrol and diesel with this report based upon quality data for the deliveries to the depots in 2012. The Swedish Transport Agency plans to do a similar follow-up control in the autumn of 2013 to also verify the 2013 FQMS Report.

30.2.2.2 FQMS Administration

This FQMS Report is under the responsibility of The Swedish Transport Agency. The Swedish Petroleum and Biofuels Institute assist the Swedish Transport Agency in compilation of quality data for the annual FQMS Report. Sampling and subsequent analysis for the control of the national monitoring is carried out by accredited test laboratories.

The Swedish Transport Agency controlled the reliability of The Swedish Petroleum and Biofuels Institutes compilation for the FQMS 2012 Report. The tests were carried out by an accredited test laboratory. The samples from the actual fuel dispensing sites showed full equivalency for both petrol and diesel to the FQMS 2012 Report. A follow-up assessment is planned for in the autumn of 2013 to also verify the 2013 FQMS Report. One reason for Sweden to choose this system is the considerable costs associated with the extensive sampling in a large, sparsely populated MS like ours with long geographical distances. Another reason is the substantial annual costs associated with the subsequent analysis of the large number of samples per fuel grade required by the statistical model in question according to EN 14274:2003.

Fuels and fuel quality are regulated through the act Drivmedelslag (2011:319) the ordinance Drivmedelsförordning (2011:3146). According to 14 § in Drivmedelsförordning (2011:3146) The Swedish Transport Agency exercise the supervision over most parts of the national fuel regulation including fuel quality and is thereby the authority responsible for taking action where non-compliant samples have been discovered.

The number of national refineries in Sweden, producing automotive fuels, is 3. The number of distribution terminals for automotive fuels are 32.

It is no problem for Sweden to provide the annual Fuel Quality Monitoring data, based upon the national system, by the deadline date 30th June.

30.2.2.3 National Legislation that Transposed the FQD

The Swedish Transport Agency is responsible for managing and implementing most parts (including fuel quality) of the FQM except for the parts of the Directive dealing with Greenhouse gas emission reductions and Sustainability criteria for biofuels (i.e. Article 7a-7d) which is a responsibility of The Swedish Energy Agency.

The specific fuel quality legislation of the Fuel Quality Directive 98/70/EC has in Sweden been transposed into the national Act Drivmedelslag (2011:319), the national Ordinance Drivmedelsförordning (2011:346) and provisions from The Swedish Transport Agency; TSFS 2011:66, Transportstyrelsens föreskrifter och allmänna råd om informationskrav avseende tillsatser i drivmedel).

The Swedish Energy Agency is, as previously mentioned, is responsible for Article 7a-7d of the FQM Directive. There is a national act and a national ordinance about Sustainability criteria for biofuels; Lagen (2010:598) om hållbarhetskriterier för biodrivmedel och flytande biobränslen and Förordning (2011:1088) om hållbarhetskriterier för biodrivmedel och flytande biobränslen, respectively. There are also the authority provisions STEMFS 2011:2; Statens energimyndighets föreskrifter om hållbarhetskriterier för biodrivmedel och flytande biobränslen.

The act contains the fuel specifications (Article 3 and 4 in the FQM Directive 98/70/EC) and standard references among them SS-EN 228:2008 in 6§ e. In Sweden we have two environmental classes of petrol for automotive use. Petrol environmental class 1, in the act, equals the formal national standard SS 155422. SS 155422 is now included as a national Appendix of EN 228. Under the headline Bensin i miljöklass 2 (Petrol in Environmental class 2) petrol that equals EN 228 and ANNEX 1 of 98/70/EC is found. We also have three environmental classes of diesel. Environmental class 1 and 2 for diesel equals the national standard SS 155435. In 8-10 §§ could the environmental classes for diesel be found. Diesel Environmental class 3 in the act, equals EN 590 and ANNEX II of the latest amendment to 98/70/EC.

The specific regulation about this annual FQMS Reporting (Article 8 in the FQD is found in 19 § of the national act (Drivmedelslag (2011:319) and in 7§ of the national ordinance (Drivmedelsförordning (2011:346).

The authority provisions from The Swedish Transport agency contain regulations regarding information to customers about additives (especially ethanol content in Article 3.3 and metallic additives in Article 8a of The Fuel Quality Directive).

30.2.2.4 Reporting Periods

Sweden by definition in Article 2.5 of the FQM Directive 98/70/EC belongs to the Member States with low ambient summer temperatures and have also applied for and been granted a vapour pressure derogation for the placing on the market of petrol with a maximum vapour pressure of 70 kPa during the summer period according to Article 3.5. in the Directive.

Transition periods for petrol between summer and winter grade differ depending on if it is the north or the rest part of Sweden. The summer and winter periods for petrol are regulated in 2 § of the national act (Drivmedelslag (2011:319). Summer period is from 16 May to 31 August in the north of Sweden and from the 1 May to the 15 of September in the rest of Sweden. Winter period is 16 October in the north of Sweden and 1 November to 15 March in the rest of Sweden. During the transition periods both winter and summer qualities are allowed in order to facilitate the change between seasons. To change from winter to summer requires that the changeover starts earlier than the dates stated for the summer periods. The transition from winter to summer can differ from terminal to terminal in different areas of Sweden. How long a turnover takes depends on the terminals tank capacity and the throughput of the specific terminal.

Sweden has the same quality for diesel fuel the whole year around. This is due to the good cold properties of environmental class 1 diesel. In reality there are no winter and summer periods for diesel and no transition periods between winter and summer. In order to facilitate a comparison, the data for diesel full year in Diesel (1+2) been approximately allocated so that the summer period roughly includes April to September, Diesel (1) and the winter period roughly includes October to March, Diesel (2).

30.2.3 Compliance with Fuel Quality Limit Values

Table 30-3: Petrol Fuel Grades

Unleaded 95 - Details of samples that exceed tolerance limits:
No samples were found to be out of compliance when using summer vapour pressure of 70 as the limit value.

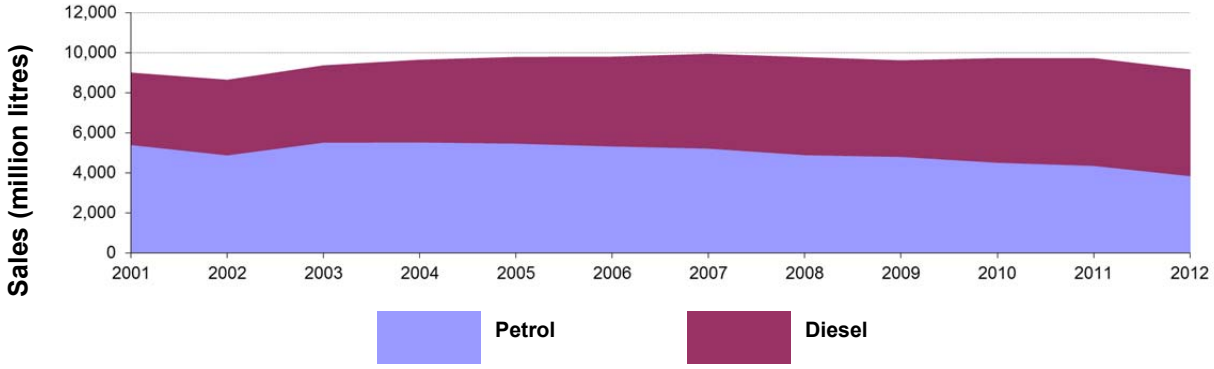
Table 30-4: Diesel Fuel Grades

Diesel - Details of samples that exceed tolerance limits:
No samples were found to be out of compliance.

30.3 Temporal Trends

Figure 30-2 shows the trend in total fuel sales since 2001; diesel sales have increased by 1,717 million litres (32.6%), whilst petrol sales have decreased by 1,555 million litres (40.3%). Since 2011 diesel sales have decreased by 51 million litres (1%), whilst petrol sales have also decreased by 512 million litres (11.7%).

Figure 30-2: Temporal trends in national sales of petrol and diesel (million litres)



30.4 Statistical Analysis

The following charts in this section are known as box-plots and they display the distribution of fuel characteristics per Member State by illustrating the:

- Sample minimum
- Lower 25% range
- Middle 50% range
- Median
- Upper 25% range
- Maximum

For a full explanation of the information presented in a Box Plot diagram, please see Section 4 of the wider report.

Petrol:

- Research Octane Number
- Motor Octane Number
- Summer Vapour Pressure

Diesel:

- Density at 15°C
- Distillation – 95% v/v recovered

Sample results for these parameters have been depicted using box plots based on the reported sample minimum, lower quartile (Q1), median (Q2), upper quartile (Q3), and the maximum sample value.

30.4.1 Petrol and Diesel Analysis

Sweden has not provided the additional detail requested for 2012 reporting to enable further analysis.

30.5 Key Areas for Improvement

The following table summarises the main areas in which improvements could be made to the monitoring system, reporting or compliance with Directive limit values. The table includes key recommendations from the previous year to give an assessment of what action has been taken by the Member State to address any issues that may have been highlighted.

Key Areas for Improvement (3 years)		
	Monitoring	**Reporting**
2012	• Samples should be taken from service stations and not terminals. • Parameter results for methanol, ethanol, iso-propyl alcohol, tert-butyl alcohol, iso-butyl alcohol and other oxygenates, for petrol samples provided. • Parameter results for FAME, for diesel samples provided.	Provision of statistical analysis for parameter values. The 2012 report was received on the 28th June, before the 30th June deadline.
2011	• Sweden has not provided details regarding the frequency of sampling in 2011. • Diesel grade samples not reported in summer or winter (there is no seasonal change to the diesel quality in Sweden) and therefore it is not possible to determine compliance against minimum sampling requirements (although based on the overall sample numbers it seems likely that Sweden	The 2011 report was submitted within Member State deadline. No details have been provided in 2011 for specification of test methods or collection of sales data.

Key Areas for Improvement (3 years)		
	Monitoring	**Reporting**
	met the requirements). • Sweden did not report parameter results for oxygen content, methanol, ethanol, iso-propyl alcohol, tert-butyl alcohol, iso-butyl alcohol, other oxygenates or manganese for petrol fuel grades in 2011. • Sweden did not report parameter results for FAME content for diesel fuel grades in 2011. • Sweden did not complete the statistical results section of the template and hence no statistical analysis charts for petrol or diesel are available to detail the distribution of sample results for the selected parameters. While this reporting element is not mandatory, additional information was requested by the Commission in order to enhance comparability and assessment of EU-wide FQM results.	
2010	• Analytical and statistical results tables not completed for petrol and diesel grades, so no statistical analysis able to be undertaken. • No split of sales by region provided. • Diesel grade not sampled in winter. • Samples taken at terminals and not fuel stations. • Not all petrol parameters sampled.	Frequency of sampling per month is not reported. No details provided on specification of test methods. No details provided on source of sales data.

31 UK

31.1 Fuel Availability 2012

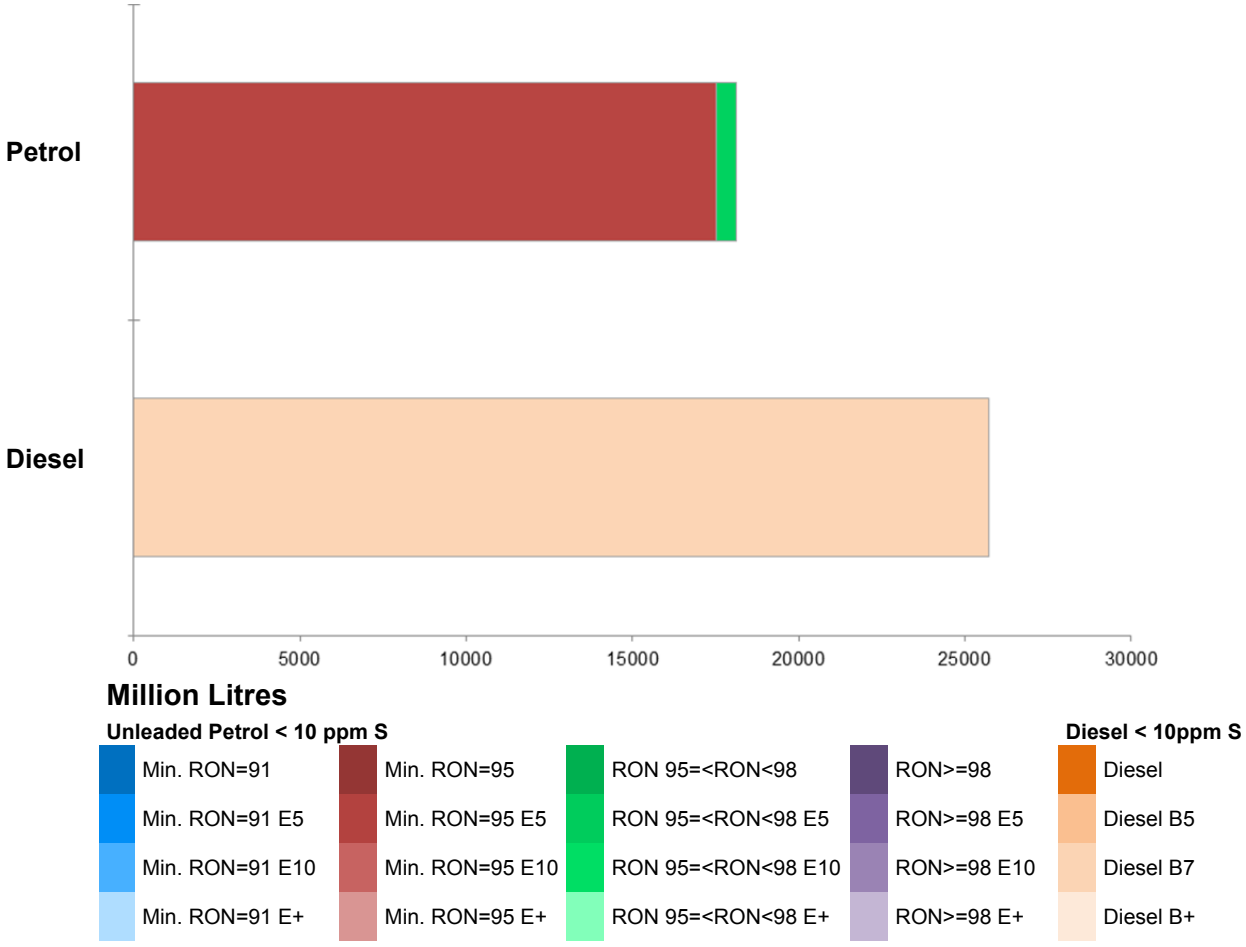
The following table lists the fuels that were reported to be available nationally in 2012.

Table 31-1: National fuel grade

Fuel grade	National fuel grade
Unleaded petrol (minimum RON = 95) E5	Premium
Unleaded petrol (minimum 95 =< RON < 98) E5	Super
Diesel fuel B7	Diesel

31.1.1 Sales, sampling and reporting

Figure 31-1: Fuel Sales proportions by fuel type



During 2012 fuel sales in UK were dominated by diesel fuel sales; 25,728 million litres of diesel was sold in comparison to 18,109 million litres of petrol fuel sales (all petrol grades combined). Petrol fuel sales were mainly comprised of fuel grade RON 95 E5.

Table 31-2: Fuel sales and sampling

Fuel type (Parent Grade)	Sales (Million litres)	Sales, % total of fuel type	Samples (1) S	Samples (1) W	Samples (1) TR (2)	Separate S/W(3)	Para-meters measured (4)	Add. Notes
Unleaded petrol min. RON=95 (<10 ppm S) E5	17,501	96.65%	345	1014	(100)	No	19 of 19	(a)
Unleaded petrol 95=<RON<98 (<10 ppm S) E5	607	3.35%	83	240	(4)	No	19 of 19	(a)
Total Petrol	**18,109**	**100.00%**	**428**	**1254**	**(104)**	**No**	**19 of 19**	(a)
Diesel (<10 ppm sulphur) B7	25,728	100.00%	646	1889	(100)	No	6 of 6	(a)
Total Diesel	**25,728**	**100.00%**	**646**	**1889**	**(100)**	**No**	**6 of 6**	(a)

(1)	Samples	The actual number of samples taken by the Member State in the summer (s) and winter (w) periods
(2)	TR	Total requirement per summer and winter period according to EN 14274. Brackets () show where a national model is being used, and the requirement is indicative to demonstrate equivalence with EN14274.
(3)	Separate S & W?	Yes indicates separate summer & winter reporting, and No indicates full year sample results reporting only.
(4)	Parameters measured	Currently 19 petrol parameters should be tested and reported by the Member States and 6 diesel parameters. The UK reported on all parameters for all fuel grades.
(a)	Additional notes	No breakdown of summer and winter sampling provided and only minimum detail provided about manganese analysis.

31.1.1.1 Petrol Samples

The UK has exceeded the minimum sampling requirements for all petrol fuel grades, for a large country. Every batch of fuel imported into the country is sampled in addition to sampling on forecourts, samples taken include; 437 at forecourts, 397 at terminals and 848 at refineries. The UK's national system demonstrates equivalence with EN14274 by virtue of the large number of samples taken. Full compliance with the standard, however, would require more samples from retail sites and a breakdown of summer and winter samples which is not given.

31.1.1.2 Diesel Samples

The UK has exceeded the minimum sampling requirements for all diesel fuel grades, for a large country. Samples taken in the UK for Diesel include; 263 at forecourts and 2722 at refineries. It is unclear as to whether diesel fuel samples tested in 2012 complied with the total minimum requirement, as there is no summer or winter breakdown of sample results provided. However, given the very high sample quantities it is likely that the minimum requirement was met.

31.2 Fuel Quality Monitoring 2012

31.2.1 Description of System

Responsible organisation(s)	Department for Transport (DfT)

Fuel Quality Monitoring System (FQMS)	National system.
Country Size	Large
Summer Period	Arctic
Location(s) of sampling	The UK fuel quality monitoring system makes use of industry quality analyses on every batch of fuel produced in, or imported into, the UK, plus samples taken at distribution terminals and forecourts (to check for contamination in the distribution network). Due to the very large number of samples involved, this approach provides an equivalent or greater, degree of confidence to EN 14274. The UK have reported a total of 4217 samples, of which 700 samples are taken from retail stations, 397 samples from terminals and the remaining samples from refineries.
Time/frequency of sampling	Samples have been taken every month throughout the year. The UK has reported extremely varied sample numbers for both summer and winter periods.
Specification of test methods	All of the samples were tested against BS EN228 (Petrol) and BS EN590 (Diesel) which fully meet the FQD standards.
Collection of sales data	The source of sales data in the United Kingdom is DECC Energy Statistics data.

Other details

The UK fuel quality monitoring system makes use of industry quality analyses on every batch of fuel produced in, or imported into, the UK, plus samples taken at distribution terminals and forecourts (to check for contamination in the distribution network). Due to the very large number of samples involved, this approach provides an equivalent, or greater, degree of confidence to EN 14274

31.2.2 Fuel Quality Monitoring System

31.2.2.1 Sampling

Sampling is done at refineries, terminals and refuelling stations. Samples are done routinely throughout the year; the numbers for each month are shown in the Petrol and Diesel are shown on the sheets showing the test results. The test methods used are in accordance with EN 228 & EN 590.

31.2.2.2 FQMS administration

The Department for Transport manage the Fuel Quality system for the UK. The UK fuel quality monitoring system makes use of industry quality analyses on every batch of fuel produced in, or imported into the UK, plus samples taken at distribution terminals and forecourts (to check for contamination in the distribution network). Due to the very large number of samples involved, this approach provides an equivalent, or greater degree of confidence to EN 14274. There are 7 operational fuels refineries within the UK and approximately 50 distribution terminals.

31.2.2.3 National Legislation that transposed the FQD

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

31.2.2.4 Reporting periods

The summer period for petrol is between 1st June - 31st August. The UK is classified as Arctic country therefore the maximum vapour pressure of fuel during the summer period is 70 kPa.

31.2.3 Compliance with Fuel Quality Limit Values

Table 31-3: Petrol Fuel Grades

Premium Unleaded BS EN:228 2008 - Details of samples that exceed tolerance limits:					
Parameter	**Limit Value**	**Tolerance Limit* (TL)**	**Max/Min value of samples tested**	**No samples outside TL**	**% samples outside TL**
Vapour Pressure (kPa)	70	71.9	72.4	4	0.67%
Aromatics, % v/v	35	37.2	38.3	2	0.16%
MemberState notes					
Sample taken at a service station.					
Super Unleaded BS7800 - Details of samples that exceed tolerance limits:					
Parameter	**Limit Value**	**Tolerance Limit* (TL)**	**Max/Min value of samples tested**	**No samples outside TL**	**% samples outside TL**
Vapour Pressure (kPa)	70	71.9	87.9	2	1.7%
Aromatics, % v/v	35	37.2	37.3	5	1.6%
Oxygen content, % (m/m)	2.7	2.9	3	1	0.41%
Member State notes					
Sample taken at a service station.					

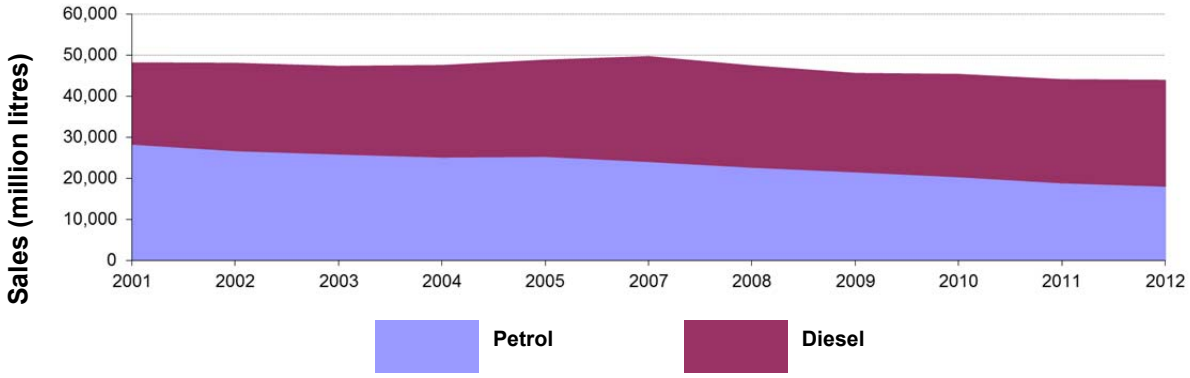
Table 31-4: Diesel Fuel Grades

Diesel - Details of samples that exceed tolerance limits:					
Parameter	**Limit Value**	**Tolerance Limit* (TL)**	**Max/Min value of samples tested**	**No samples outside TL**	**% samples outside TL**
Cetane number	51	48.5	47.1	3	0.15%
Sulphur content, mg/kg	10	11.3	14	1	0.04%
Member State notes					
Sample taken at a service station.					

31.3 Temporal Trends

Figure 31-2 shows the trend in total fuel sales since 2001; fuel sales have gradually decreased with a large decrease in petrol sales of 10,234 million litres (56.5%) and an increase of diesel sales of 5,995 million litres (23.3%). Sales in the period 2011 to 2012 shows a 811 million litre (4.3%) decrease in petrol sales, whilst there has been a 665 million litre (2.7%) increase in diesel sales.

Figure 31-2: Temporal trends in national sales of petrol and diesel (million litres)



31.4 Statistical Analysis

The following charts in this section are known as box-plots and they display the distribution of fuel characteristics per Member State by illustrating the:

- Sample minimum
- Lower 25% range
- Middle 50% range
- Median
- Upper 25% range
- Maximum

For a full explanation of the information presented in a Box Plot diagram, please see Section 4 of the wider report.

Fuel sampling in the UK in 2012 recorded 12 samples (out of 4217) to be out of tolerance limits. The analysis charts for petrol (Figure 31-3) and diesel (Figure 31-4) detail the distribution of sample results for the 5 selected parameters; though Summer Vapour Pressure has not been detailed as the UK has not provided a summer and winter breakdown for 2012.

Petrol:

- Research Octane Number
- Motor Octane Number
- Summer Vapour Pressure

Diesel:

- Density at 15^{o}C
- Distillation – 95% v/v recovered

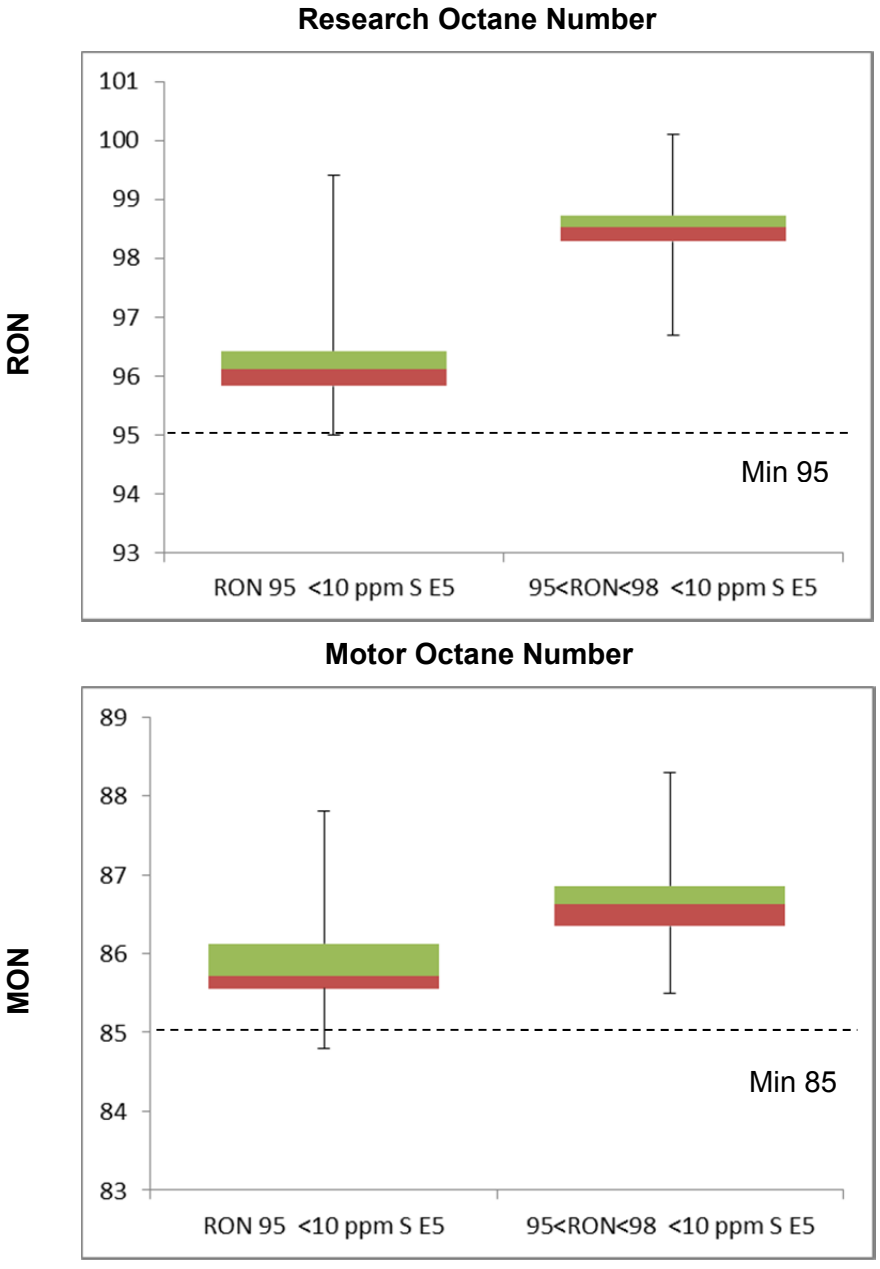
Sample results for these parameters have been depicted using box plots based on the reported sample minimum, lower quartile (Q1), median (Q2), upper quartile (Q3), and the maximum sample value.

31.4.1 Petrol Analysis

Sample results in 2012 have been presented in the following figures with limit values for the parameter (maximum or minimum) to demonstrate the skew of results. RON and MON sample results show that the fuels available in the UK have reasonably small variation in Octane levels as the majority of results remained within tights bands. There are outlying samples which are not within specification for RON 95; there is not a number of non-compliant samples identified by the UK submission as these outliers do not exceed tolerance limits.

The UK has provided full year data only for vapour pressure tests, so it is not possible to draw box plots for vapour pressure results during the Summer period only; therefore the plot has been excluded to be consistent with other Member State reports.

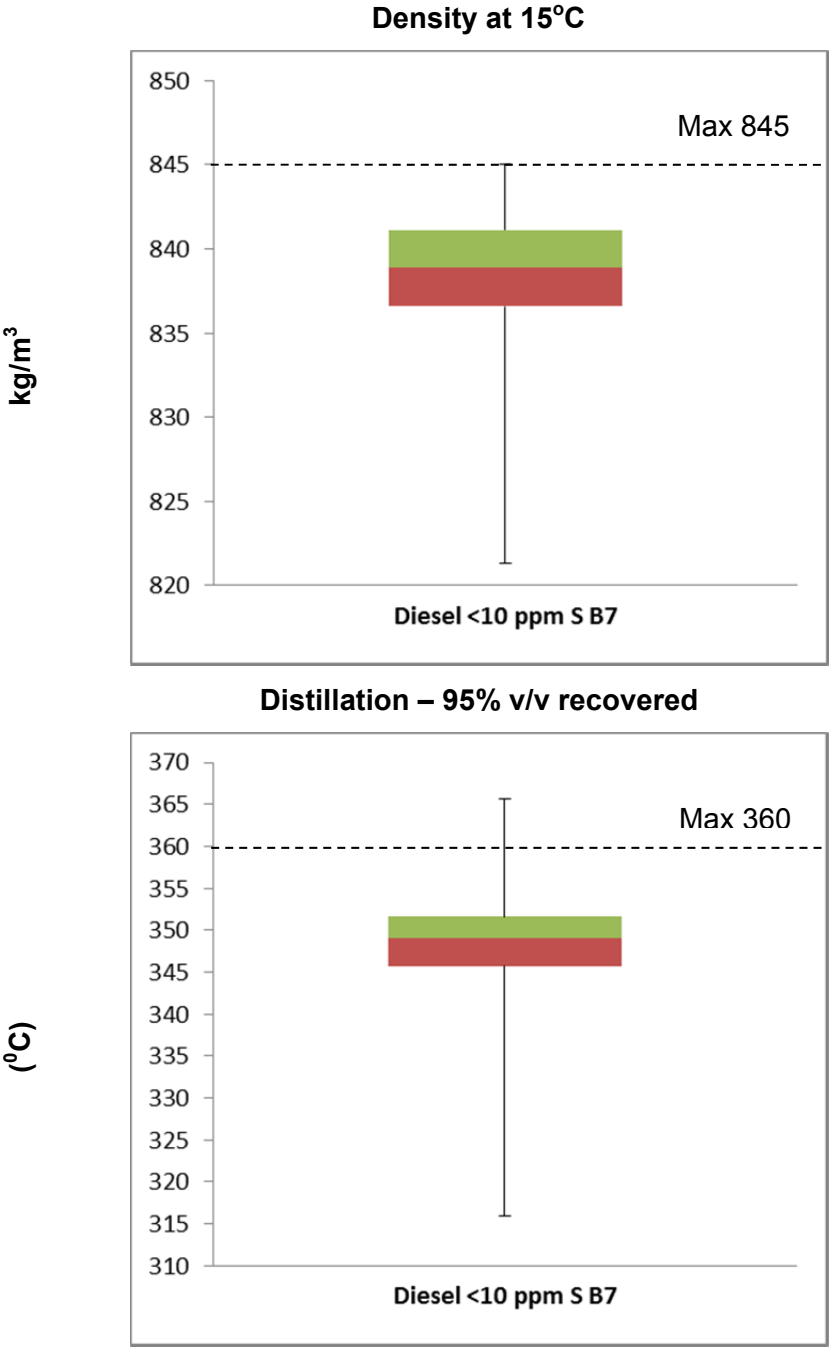
Figure 31-3: Petrol analysis



31.4.2 Diesel Analysis

Sample results for Density and Distillation show a slightly wider variation in density, exhibited by the widely spread coloured bands at the 25 and 75 quartile – in comparison to the tight bands shown in the petrol analysis box plots. Samples are shown to be within specification.

Figure 31-4: Diesel analysis



31.5 Key Areas for Improvement

The following table summarises the main areas in which improvements could be made to the monitoring system, reporting or compliance with Directive limit values. The table includes key recommendations from the previous year to give an assessment of what action has been taken by the Member State to address any issues that may have been highlighted.

Key Areas for Improvement (3 years)		
Year	**Monitoring**	**Reporting**
2012	• Details of summer vapour pressure, for the summer period only would improve future FQMS submissions. • Details of the number of samples, which have exceeded limit values, would benefit future reports. • Providing data for summer and winter period would improve analysis and help identify whether the UK is compliant with EN14274. • Further details of the manganese analysis would benefit future reports.	The report was submitted on the 28th June, before the 30th June deadline.
2011	• The UK did not fully complete the statistical results section of the template and hence no statistical analysis charts for summer vapour pressure for petrol are available to detail the distribution of sample results for the selected parameters. However, the samples were taken across all areas of the UK including Wales, Scotland and Northern Ireland. While this reporting element is not mandatory, additional information was requested by the Commission in order to enhance comparability and assessment of EU-wide FQM results. • 138 samples were taken at retail sites, the remainder were from terminals and refineries. It is not clear whether the UK's national system demonstrates equivalence with EN14274, where more samples from retail sites would be required • It is also unclear whether the UK's monitoring regime demonstrates equivalence with EN14274 given there is no summer and winter breakdown of samples provided in 2011.	The 2011 report was submitted within Member State deadline. All of the samples were tested against BS EN228 (Petrol) and BS EN590 (Diesel) which fully meet the FQD standards.
2010	• A national system is used based on industry quality analysis of all fuels from refineries and import terminals and samples at fuel stations. The sample numbers include 166 samples from retail stations and an	Do not report summer winter sampling split

Key Areas for Improvement (3 years)		
Year	**Monitoring**	**Reporting**
	additional 112 from terminals with the remaining samples from refineries. • Samples are taken from across the UK including Wales, Scotland and NI. No additional detail on breakdown of sales by regional is available. • Only 14 of 18 petrol parameters tested for RON 95.The 4 missing parameters were tested but not included on the report because the test was not detectable.	

32 Discussion and Conclusion

32.1 Discussion

Key Messages

- Consistency of reporting is key to enable accurate temporal and national comparisons of fuel quality within the Community.
- Clear guidelines and a common format is required in order to ensure reporting obligations and timelines are understood and can be met.
- Overall, in 2012 there has been a distinct improvement in the timeliness, coverage and quality of reporting by Member States. This has significantly improved the completeness, accuracy and punctuality of EU-wide reporting.

32.1.1 Reporting Submissions

32.1.1.1 Completeness

The original format for reporting Fuel Quality Monitoring was agreed with Member States was officially established with 'Commission Decision 2002/159/EC of 18 February 2002 on the common format for the submission of summaries of national fuel quality data'. This document specified that the first report be submitted to the European Commission by 30 June 2002 in both paper and electronic formats and this requirement remains in place. A reporting template has been developed using Microsoft Excel in order to facilitate analysis, ensure rapid assessment of the data and reduce the need to seek clarification from Member States. The Microsoft Excel template is appropriate for the numerical data contained within the report – with provision made for explanatory sections.

The completeness of submissions has improved over time. The majority of Member States now meet the deadline on 30 June and submit their reports in electronic format – all of the 27 Member States submitted their report in the dedicated 2012 template. Delays to the analysis can be caused if insufficient data is supplied, however this problem is minimised through use of the recommended reporting template.

32.1.1.2 Fuel Quality Submission Database

In addition to the preparation of this summary report, a Microsoft Access database is updated annually and contains the raw data and essential information provided by Member States. From 2010 onwards, the database has been further updated to make it more user-friendly. The database has been constructed to allow for easy selection of fields, storage/viewing of submission data, printable reports including, 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.

32.1.2 Reporting Format

Changes to the 2012 reporting template have not increased the number of queries from Member States. Since 2010, the template had been locked to prevent re-structuring or formatting of the data presented by Member States. In previous years this had led to issues whereby additional parameters had been included, or even parameters reported in place of those required by the Directive, skewing the parameter results. On the whole, the approach has been effective, with far fewer inconsistencies and a more fluid analysis process. In

addition, fewer clarifications have been necessary as the majority of Member States have provided the full information requested.

It is apparent that clear guidelines on the reporting requirements and a recommended and specially designed template will ease reporting and subsequently the analysis and incorporation of new data into the EU Summary Report.

Many reports have improved in terms of quality, accuracy and consistency in the period since reporting began. However further improvements could still be made and would be aided by the provision of a clear and updated decision on the common formats of Member States FQM reports.

32.2 Conclusions and Recommendations

Overall, in 2012 there has been a distinct improvement in the timeliness, coverage and quality of reporting by Member States. This has significantly improved the completeness, accuracy and punctuality of EU-wide reporting. In addition, all Member States have used the Commission-approved template for reporting, which has greatly improved the consistency and quality of information.

It is clear that new parameters and fuel grades will result in a transition period as Member States adapt their monitoring regime. This can be seen in 2012, with some Member States not yet monitoring all the parameters introduced. In addition, new fuel grades are resulting in challenges meeting certain parameters – particularly the higher ethanol blends and vapour pressure. The Commission have introduced a derogation to help Member States adapt to this specific issue.

It is difficult to draw definitive conclusions from the data given that temporal trends are subject to reports that have been missing over the years. In addition, a lack of clarity on how to treat particular areas (such as the transition period) creates inconsistencies between the Member State reports. In addition, the trends observed within National territories may be amplified or disguised when aggregating the data into EU-wide summaries – this could be aided by a requirement for Member States to provide an assessment of changes to conditions within their National territory. For example, in 2010, some Member States have bucked a historical trend of declining fuel sales (or vice versa) and the National assessment of why these changes occur could help to understand Community-wide patterns.

There are still some key areas to improve upon in future years and these will be monitored annually to further enhance the reliability of EU wide summary data.

Key areas for improvement

- Some Member States are unable to confirm sales figures at the time of submitting the original report and request updates to their report after the submission deadline date. These requests are honoured wherever possible; however Member States should endeavour to submit their complete and accurate reports by the 30th June.
- Reporting templates have been developed and disseminated to all in order to enable accurate, consistent, replicable and comparable reporting. Member States are encouraged to provide their annual FQM report in the template provided to assist with the timely analysis and reporting of EU-wide results. The report template is also updated annually to reflect changes as new requirements superseded those outlined originally in Directive 98/70/EC. It is anticipated that a new Commission Decision will update the Common reporting format for Fuel Quality Monitoring reports.
- As in previous years, some Member States basic numerical data appears to be inconsistent when scrutinised for the analysis. Most inconsistencies are minor – for example contradictory sample numbers when comparing those in reporting sheets with those cited in the sales reporting table. These errors are not insurmountable but

Key areas for improvement

delay reporting and, in some cases, the correct number of samples has been impossible to determine, resulting in some anomalous figures.

- Many Member States did not report test results for all parameters covered under the Directive for each fuel grade marketed in their territory. In particular, many Member States are not yet testing for MMT. This includes Belgium (where testing has begun in 2012), Bulgaria, Finland, Germany, Hungary, Italy, Lithuania, Slovenia and Sweden. Many Member States have confirmed with fuel suppliers that MMT is not used in fuels sold in their territory but have not explicitly tested for it.
- The majority of Member States have submitted complete reports that contain all information requested for 2012 by the Commission. However, some have not provided additional statistical detail about sample results requested for 2012; where the 25% of sample values and 75% of fuel sample values occur. This information has been requested in order to enable more complete statistical analysis of the sample results and EU-wide comparison of fuel quality between Member States (though it is not mandatory). Countries who have not provided this additional level of detail are the Netherlands, Romania and Sweden. Bulgaria did not provide sufficient data for all petrol grades, but did for all diesel grades. Some other Member States did not provide full information for some grades.
- Some Member States are not providing information about test methods, or the source of sales data, in their reporting. This makes it difficult to assess compliance with the Directive. Member States could include more information in future reporting.
- The test which revealed the largest number of samples exceeding tolerance limits was the summer vapour pressure limits test. Many Member States reported that exceedances were a result of service stations being slow to transition from summer to winter fuel grade, and vice-versa due to low sales volumes. Member States could be clearer about the transition periods during which time the winter/ summer fuel grades are replaced with the corresponding grades for the opposite season. If the Member States are reporting samples taken during the transition period, which are subsequently found to be out of specification, this should be made clearer.
- In some cases, it is impossible to determine whether Member States are reporting sufficient samples to comply with the Directive, either because they do not report sales volumes split by fuel grade, or because they are basing sampling volumes on historical sales (the most up-to-date information they had when deciding on sampling volumes) that were not available to the authors of this report.
- Some Member States are not fulfilling the minimum sampling requirement in summer and winter for some fuel grades, given the size of their country under EN 14274 and the statistical model they are using. Others report that sufficient samples were taken but do not provide the results of testing, so it is not possible to demonstrate compliance. Examples include the Denmark, Germany, Luxembourg and Poland. Any sampling from terminals/ refineries should be taken and reported in addition to those at service stations, to highlight any issues of contamination in the supply chain, whilst still assessing fuels at point of use.
- Some Member States are using a statistical model that may not be the most appropriate for their country, or using a national model but not providing sufficient evidence to demonstrate equivalence with EN 14274 standards.

33 Glossary

<10 ppm fuels	See sulphur-free fuels
'Arctic' Seasonal Period	Seasonal period as outlined in European Specifications relating to countries that experience low ambient summer temperatures and for which the summer period spans 1st June to 31st August.
Cetane Number	Measure of fuel ignition characteristics. Like the octane number used for petrol, the higher the value, the better the fuel performance.
Commission Decision 2002/159/EC	Commission Decision of 18 February 2002 on a common format for the submission of summaries of national fuel quality data
Commission Recommendation 2005/27/EC	of 12 January 2005 on what, for the purposes of Directive 98/70/EC of the European Parliament and of the Council concerning petrol and diesel fuels, constitutes availability of unleaded petrol and diesel fuel with a maximum sulphur content on an appropriately balanced geographical basis
Directive 98/70/EC	of 13 October 1998 relating to the quality of petrol and diesel fuels and amending Council Directive 93/12/EEC
Directive 2003/17/EC	of 3 March 2003 amending Directive 98/70/EC relating to the quality of petrol and diesel fuels
EN 14274: 2003	Automotive fuels - Assessment of petrol and diesel quality - Fuel Quality Monitoring System (FQMS)
EN 228	European Standard EN 228:2004 which specifies requirements and test methods and limits for petrol fuel parameters.
EN 590	European Standard EN 590:2004 which specifies requirements and test methods and limits for diesel fuel parameters.
Euro standards	European Union emission regulations for new vehicles, e.g. Euro 3
Fuel Dispensing Sites	See *refuelling stations.*
FQMS	Fuel Quality Monitoring System
Large-size country	Country in which a total of 15 million tons or more of automotive fuel is dispensed per annum.
Low Sulphur Fuels	Petrol and diesel fuels that contain less than 50 mg/kg (ppm) of sulphur.
MON	Motor Octane Number (petrol vehicles, related to RON)
National fuel grade	Member States may, define 'national' fuel grades that 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.
'Normal' seasonal period	The seasonal period as outlined in European Standards EN 590 and EN 228 whereby the summer period which spans 1st May until 30th September.
NRMM	Non-Road Mobile Machinery – this includes some farm machinery and construction and demolition vehicles.

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.
PAH	Polycyclic Aromatic Hydrocarbons, also known as PAH, are chemical compounds formed by the incomplete combustion of hydrocarbons and also contained in small amounts in diesel, other fuels. Many of them are known or suspected carcinogens and are consequently restricted in content in diesel.
Refuelling Stations	Sites, retail or commercial, where fuel is dispensed into road vehicles for propulsion (as defined in EN 14274: 2003)
RON	Research Octane Number (petrol vehicles, related to MON). The octane number is a performance rating used to classify motor fuels by grading the relative antiknock properties of petrol grades.
Small-size country	Country in which a total of 15 million tons or less of automotive fuel is dispensed per annum.
Sulphur free fuels	Petrol and diesel fuels that contain less than 10 mg/kg (ppm) of sulphur (whether actual distinct national fuel grades, or simply marketed products meeting this criterion).
The Sulphur Review	'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. See: http://europa.eu.int/comm/environment/sulphur/summary.pdf
Zero sulphur fuels	See *sulphur free fuels*.

33.1 Member State Abbreviations

AT	Austria
BE	Belgium
BG	Bulgaria
CY	Cyprus
CZ	Czech Republic
DK	Denmark
EE	Estonia
FI	Finland
FR	France
DE	Germany
EL	Greece
HU	Hungary
IE	Ireland
IT	Italy
LV	Latvia
LT	Lithuania
LU	Luxembourg
MT	Malta
NL	Netherlands
PL	Poland
PT	Portugal
RO	Romania
SK	Slovakia
SI	Slovenia
ES	Spain
SE	Sweden
UK	UK

34 Appendices

34.1 Details on Limit Values, Test Methods and Tolerance Limits

34.2 Reporting Template (2012)

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