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**REPORT FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT AND
THE COUNCIL**

**Quality of petrol and diesel fuel used for road transport in the European Union: Tenth
annual report
(Reporting year 2011)**

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1. INTRODUCTION

This report represents a consolidation of the eleventh year of Member States' submissions under Directive 98/70/EC¹ (the "Directive"), summarising the quality of petrol and diesel in the EU for 2011. Specifications for petrol and diesel sold in the EU are included in the Directive: the first entered into force on 1 January 2000; the second on 1 January 2005 and the third on 1 January 2009 which limited the sulphur content of all automotive road fuels in the EU to 10 ppm. Additional requirements are defined in the European Standard for fuel quality monitoring systems ("FQMS"), 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 2002². The requirements of the Directive have changed with the introduction of new fuel specifications and reporting requirements. 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 reviewed and agreed annually by the Commission. In 2011, all Member States have complied with the fuel specifications that require road fuels to contain less than 10ppm sulphur content. In addition, Member States have begun to report fuels with added ethanol, which is a mandatory reporting requirement from 1 January 2011 under Directive amendment 2009/30/EC.

Two Member States (Poland and Germany) did not submit their report in the template provided. The Netherlands did not use the template in their original submission but transposed it when requested. Of the 27 annual FQMS reports, 21 were received within the reporting deadline of 30 June, 4 were received less than one month late with two reports submitted on time but requiring transposition into the standard template. There is a clear improvement on the submissions of reports received within the deadline compared with 2010 and 2009.

2. FUEL SALES IN EUROPE

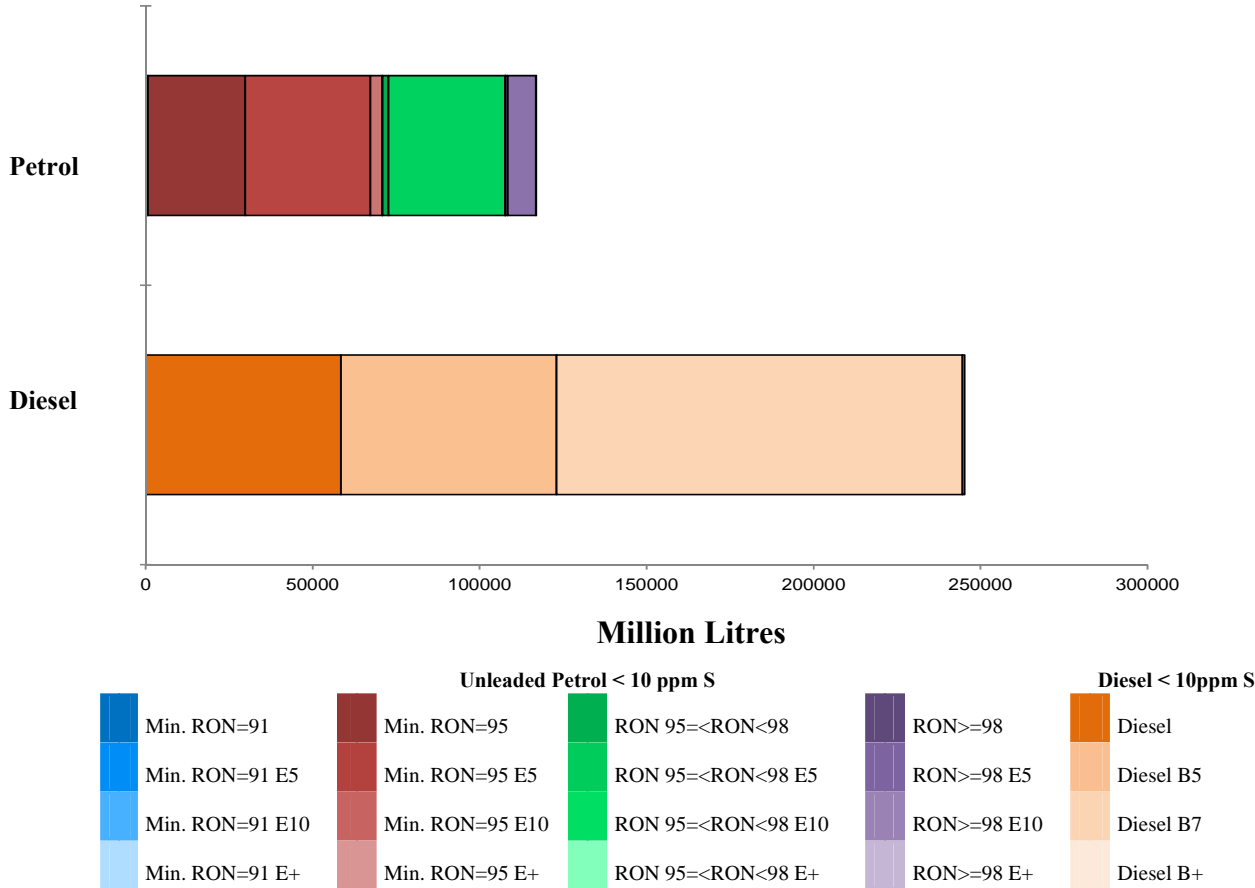
Fuel sales in the EU in 2011 were heavily weighted toward diesel with 245,227 million litres of diesel fuel sales compared to 116,893 million litres of combined petrol grade fuel sales.

¹ O.J. L 350 of 28.12.1998, p. 58

² O.J. L 53 of 23.2.2002, p.30

In petrol fuel grades, RON 91 continues to lose its market share and currently is only sold in small amounts with 2011 sales of 645 million litres. RON 98 totalled 9,196 million litres whilst RON 95 represented the majority of petrol fuel sales with 107,052 million litres. In diesel, the B7 grade represented the majority of sales with 121,545 million litres sold. B5 diesel and diesel sold around half as much each (64,523 and 58,498 million litres respectively). Figure 1 below illustrates the different sales of different fuels across Europe by type.

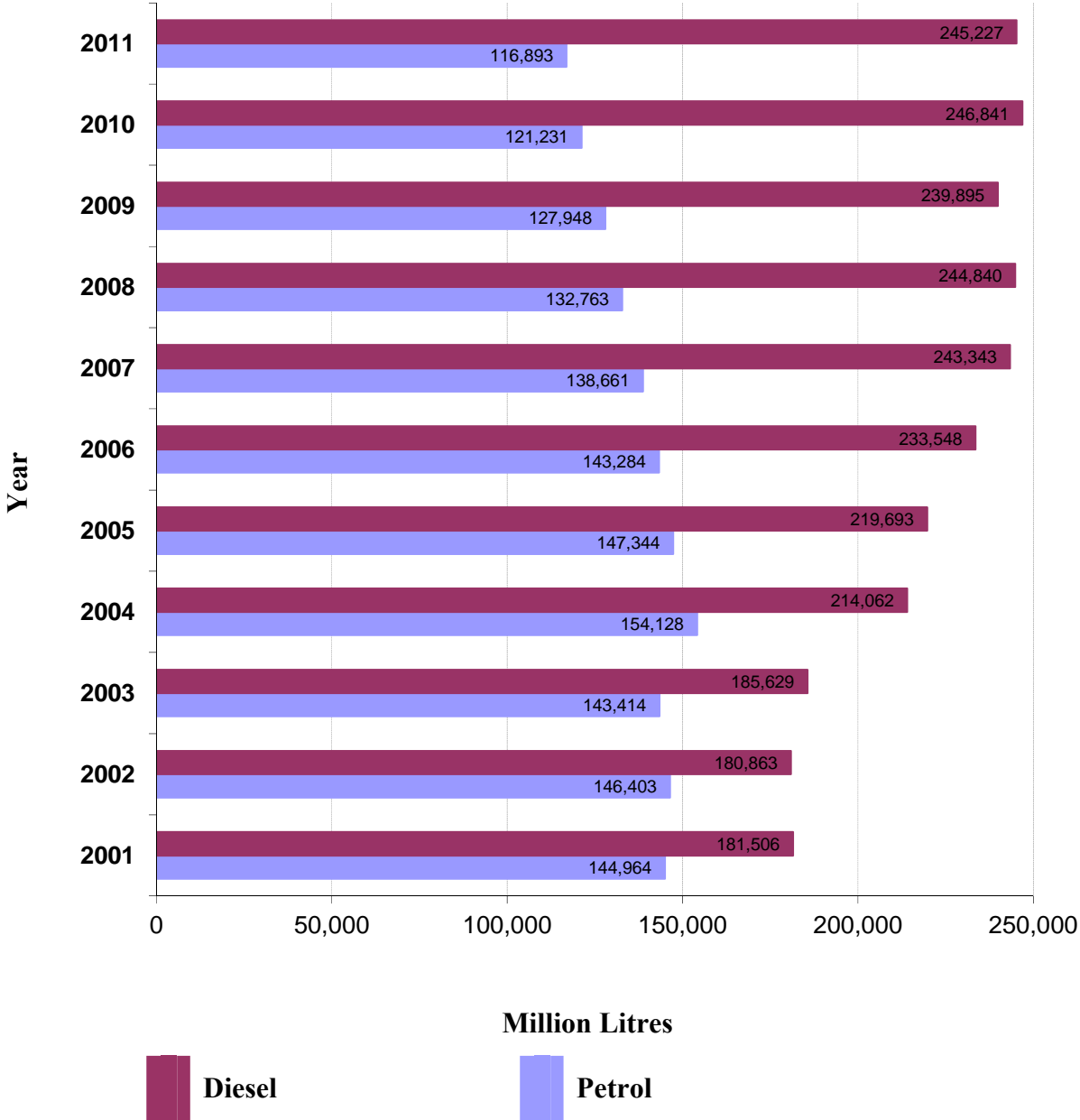
Figure 1: EU fuel sales by fuel type in 2011



Total EU fuel sales in 2011 and previous years are illustrated in figure 2.

Fuel sales in 2011 remained similar to sales in 2010, with a decrease in both petrol (reduction of 4,338 million litres) and diesel (reduction of 1,614 million litres) fuel sales resulting in an overall total decrease of 5,952 million litres of automotive road fuels sold.

Figure 2: Volume of fuels sold in the EU type from 2001 – 2011



* 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. FUEL AVAILABILITY 2011

One of the main facts of 2011 is that RON 91 has almost disappeared from the market and is with sales in only 4 countries totalling 645 million litres. Table 1 illustrates the distribution and quantities of fuels sold across the EU 27 by Member State and fuel type.

Table1: 2011 EU27 Fuel Sales by type

Fuel Type	Petrol Sales (million litres)			Diesel Sales (million litres)		
	min. RON=91	min. RON=95	min. RON=98	RON ≥98	Total Petrol	Total Diesel
Austria	48	-	2,274	56	2,378	7,248
Belgium	-	1,405	-	355	1,760	8,738
Bulgaria	-	763	3	39	805	2,184
Cyprus	-	473	-	38	511	391
Czech Republic	30	2,342	-	39	2,411	4,820
Denmark	390	1,596	2	-	1,988	3,249
Estonia	-	387	20	-	407	678
Finland	-	1,035	-	1,127	2,162	2,872
France	-	8,397	-	1,988	10,385	40,327
Germany	177	-	23,100	3,261	26,538	39,417
Greece	-	4,268	90	143	4,501	2,628
Hungary	-	1,651	-	42	1,693	3,293
Ireland	-	1,856	-	-	1,856	2,675
Italy ¹	-	11,678	-	-	11,678	30,231
Latvia	-	-	310	24	334	807
Lithuania	-	336	-	7	343	1,225
Luxembourg	-	378	-	92	470	2,054
Malta	-	-	99	-	99	105
Netherlands	-	5,625	71	-	5,696	7,783
Poland	-	4,964	-	412	5,376	14,905
Portugal	-	-	1,538	139	1,677	5,505
Romania	-	-	1,748	161	1,909	4,149
Slovakia	-	706	-	12	718	1,263
Slovenia	-	-	83	653	736	1,580
Spain	-	-	6,559	608	7,167	26,712
Sweden	-	4,223	152	-	4,375	5,324
UK	-	18,157	763	-	18,920	25,064

1: The data provided by Italy show the same value as reported 2010 which may lead to questions as to their accuracy.

Some general considerations can be noted:

- Diesel dominates the market in all but two of the Member States with petrol representing 63.1% share of Greek fuel sales and 56.6% 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 2011 took place in Germany, with a total of 18.2% fuel sales and a national mix of petrol/diesel, of 40.2% of petrol fuel sales and 59.8% of diesel fuel sales. The next biggest market in the EU was France with a 14.0% share of fuel sales and with a national mix of petrol/diesel sales of 20.5% and 79.5% respectively, the third biggest EU market was the UK with sales that totalled 12.1% of the fuels sold in the EU, with a country mix of 43% petrol and 57% diesel.
- There is still a low market penetration of E10, with only three countries (Germany, France and Finland) currently selling it.

4. FUEL QUALITY MONITORING 2011

4.1. Description of systems used by different Member States

A number of different approaches have been used to implement FQMS across the EU, although consistency between Member States has improved slightly year on year. Approaches range from those based on European Standard EN 14274³, with sampling at a range of fuel retail stations, through to national systems.

Alternative monitoring systems may be permitted by the Directive, provided such systems ensure the results are of an equivalent confidence to EN 14274, 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 2011, 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 2011:

- 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)

³ EN 14274:2003 - Automotive fuels - Assessment of petrol and diesel quality - Fuel Quality Monitoring System (FQMS).

- 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

4.2. Sampling and reporting

One of the key points in the measurement of the fuel quality is the how fuels are sampled. This sampling must done in accordance with requirements laid down in EN 14274.

This standard indicates the number and location of samples to be taken and reported in Member States' fuel quality reports. The standard also specifies the minimum number of samples per fuel grade in each of the winter and summer periods. Table 2 provides a breakdown of individual Member States' sampling and reporting in 2011. 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).

Table 2 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 2011, apart from Germany. Germany provided results from sampling under two separate methodologies, but did not indicate the total number of samples taken (as some samples were tested using both methodologies, others only one), and it is therefore not possible to determine compliance with sample quantities. 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.

There is a positive change in 2011 in the Member States in the improvement of the FQMS and their sample processes like, for example, Denmark which is implementing a new system to be in conformity the requirements of the Directive.

Non-compliance of individual sample tests with petrol fuel standard EN 228 have decreased in 2011 compared to 2010, with non-compliance for diesel against EN 590 also decreasing in 2011. The full report can be found in *EU Fuel Quality Monitoring – 2011 Summary Report - Final report to the European Commission DG Climate Action*, available on the webpage of DG Climate Action.

Table 2: 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	104	100	153	150	153	150	✓	✓
Belgium	BE	N	S	✓	(50)	(200)	(100)	2006	5325	2006	5325	(✓)	(✓)
Bulgaria	BG	B	S	✓	100	410	200	473	496	461	482	✓	✓
Cyprus	CY	C	S	✓	50	108	100	233	140	233	140	✓	✓
Czech Republic	CZ	C	S	✓	50	102	104	944	955	944	1015	✓	✓
Denmark	DK	N	S	✓	(50)	(200)	(100)	41	21	41	9	(×)	(×)
Estonia	EE	C	S	✓	50	104	100	350	210	350	210	✓	✓
Finland	FI	A	S	✓	50	200	100	224	126	224	126	✓	✓
France	FR	B	L	✓	200	800	400	487	420	395	420	×	✓
Germany	DE	B	L	✓	200	802	400	520	363	0	0	×	×
Greece	EL	A	S	✓	50	106	100	112	100	33	20	×	×
Hungary	HU	C	S	✓	50	102	100	120	120	120	120	✓	✓
Ireland	IE	C	S	✓	50	100	100	149	136	94	97	×	×
Italy	IT	A	L	✓	100	200	200	200	200	200	200	✓	✓
Latvia	LV	N	S	✓	(50)	(108)	(200)	202	307	173	160	(✓)	(✓)
Lithuania	LT	C	S	✓	50	102	100	104	100	92	91	×	×
Luxembourg	LU	N	S	✓	(50)	(200)	(100)	89	98	81	98	(×)	(×)
Malta	MT	N	S	✓	(50)	(100)	(100)	32	27	21	18	(×)	(×)
Netherlands	NL	N	S	✓	(50)	(100)	(100)	100	100	100	100	(✓)	(✓)

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.
Poland	PL	B	S	✓	200	216	206	265	295	265	295	✓	✓
Portugal	PT	C	S	✓	50	108	100	254	122	200	100	✓	✓
Romania	RO	B	S	✓	100	216	200	224	222	224	222	✓	✓
Slovakia	SK	C	S	✓	50	102	100	155	123	155	123	✓	✓
Slovenia	SI	C	S	✓	50	200	100	145	178	142	115	×	✓
Spain	ES	A	L	✓	100	216	200	634	330	0	0	×	×
Sweden	SE	N	S	✓	(50)	(104)	(100)	672	756	0	0	(×)	(×)
UK	UK	N	L	✓	(100)	(208)	(200)	1369	2298	68	65	(×)	(×)

#	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 (in particular France and the Czech Republic, where samples taken at service stations is greater than samples taken).

(8)	Sampling Compliance	<p>✓ 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 ().</p> <p>Where Member States have not provided a breakdown of sampling location, it is not possible to assess sampling compliance.</p>
	Pet.	Petrol
	Dsl	Diesel

5. COMPLIANCE WITH THE DIRECTIVE'S LIMIT VALUES

5.1. Petrol reporting

In 2011, most 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 parameters found to be out of specification most frequently within the EU in 2011 were:

- Summer Vapour Pressure was exceeded 106 times in 2011. However, it is becoming apparent that many exceedances are the result of transitional periods, when suppliers swap the summer specification fuel for winter specification fuel and vice versa.
- RON/MON samples found to be out of specification in 2011 totalled 38 samples.

Some Member States did not provide full details of samples found to be out of compliance with tolerance limits.

5.2. Diesel reporting

In 2011, some Member States did not provide full details of samples found to be out of compliance with tolerance limits. Of the 6 parameters required to be tested for diesel in 2011, parameters found to be out of specification were:

- The sulphur content maximum of 10ppm was exceeded by a total of 126 samples. However the average sulphur content for all Member States remains below the mandatory limit of 10ppm at 5.8 ppm.
- In total, 19 samples tested for distillation limits were found to be out of specification.

5.3. Summary

Table 3 summarises the compliance of Member States with the Directive for 2011 reporting in terms of the results of the analysis of samples against Tolerance Limits and the reporting

format and content. Amendments to the Directive 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 10,257 samples tested for petrol in 2011, 211 were found to be out of specification with tolerance limits for one or more parameter, which represents a non-compliance rate of 2.0%. Of the 13,718 samples tested for the 6 mandatory parameters for diesel in 2011, 203 were found to be non-compliant with specified limits, representing 1.5% 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 dependant (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 EU weighted by volume and by sample numbers.

Table 3: Summary of Member State compliance for 2011 reporting

MS	Non-compliance with limit values non-compliant samples (NC) / total samples				Incomplete reporting parameters not measured (NM) / total				Late report (months)
	(1)				(2)				
	Petrol		Diesel		Petrol		Diesel		
	NC	Total	NC	Total	NM	Total	NM	Total	
AT	6	153	8	150	0	19	0	6	< 1 month
BE	70	2006	89	5325	1	19	0	6	On time
BG	27	473	19	496	5	19	0	6	On time
CY	21	233	6	140	0	19	0	6	On time
CZ	22	944	19	955	0	19	1	6	On time
DK	0	41	0	21	0	19	0	6	On time
EE	9	350	0	210	0	19	0	6	On time
FI	1	224	0	126	1	19	1	6	On time
FR	17	487	39	420	0	19	0	6	On time
DE	3	520	7	363	1	19	0	6	<2 months
EL	0	112	0	100	1	19	0	6	< 1 month
HU	4	120	1	120	1	19	0	6	On time
IE	1	149	1	136	0	19	0	6	On time
IT	0	200	0	200	7	19	0	6	On time
LV	0	202	0	307	0	19	0	6	< 1 month
LT	0	104	0	100	1	19	0	6	On time
LU	5	89	1	98	1	19	0	6	On time
MT	5	32	3	27	1	19	0	6	On time
NL	0	100	0	100	1	19	1	6	On time
PL	5	265	2	295	1	19	2	6	On time

MS	Non-compliance with limit values non-compliant samples (NC) / total samples				Incomplete reporting parameters not measured (NM) / total				Late report
	(1)				(2)				(3)
	Petrol		Diesel		Petrol		Diesel		(months)
	NC	Total	NC	Total	NM	Total	NM	Total	
PT	5	254	2	122	0	19	0	6	On time
RO	1	224	0	222	1	19	0	6	On time
SK	3	155	4	123	1	19	0	6	On time
SI	0	145	2	178	1	19	1	6	On time
ES	0	634	0	330	0	19	0	6	< 1 month
SE	1	672	0	756	8	19	1	6	On time
UK	5	1369	0	2298	0	19	0	6	On time
No. Countries								27	

(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

Another important part of the assessment of fuel quality that is put on the market in each Member State is compliance with specific parameters that need to be checked. Currently there is a deviation in some Member States regarding this matter. In the full report for 2011 in the *Table relating to the Summary of parameters not reported by Member States for each fuel grade, of the overall EU Fuel Quality Monitoring – 2011 Summary Report - Final report to the European Commission DG Climate Action*, it is indicated, by Member State the number of parameters that are not measured.

Even considering that this situation does not pose a problem for the assessment of the overall fuel quality in Europe, it is an area that needs to be improved in 2012.

6. CONCLUSIONS

Fuel quality has a strong link to both CO₂ and air quality emissions, as well as the ease and cost with which pollutant and greenhouse gas emission limits can be achieved by vehicle manufacturers.

The monitoring of fuel quality in 2011 shows that the specifications for petrol and diesel laid down in Directive 98/70/EC are in general met and very few exceedances were identified.

The revision of standard EN 14274 will provide further clarification to the Member States, which will lead to greater consistency in the data available for assessment of the various fuel quality parameters.

There is also a recognized will by the Member States to make an effort to improve their understanding of reporting requirements and of their FQMS.

As exceedances are relatively rare and most Member States take action to remove non-compliant fuel from sale, the Commission is not aware of any negative repercussions on vehicle emissions or engine functioning due to these exceedances. However, the Commission urges Member States to continue to take action to ensure full compliance so that such problems do not arise in the future.