EUROPEAN EXCHANGE OF AIR QUALITY MONITORING META INFORMATION IN 2004

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Front page photo: roof of measurement station Bentinckplein, Rotterdam, the Netherlands (photograph by P.Kummu, DCMR Milieudienst Rijnmond)

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SUMMARY

Current air quality legislation of the European Union, Council Decision (97/101/EC), requires the Commission to prepare yearly a technical report on the meta information and air quality data flows that have been exchanged among the European Union Member States and the Commission. Besides the EU Member States, other member and collaborating countries of the European Environment Agency, which include EU Acceding Countries and EFTA states, have agreed to follow this reporting procedure as well. All this information is made available in the AIRBASE database, accessible at "airbase.eionet. europa.eu". The results of the reporting cycle presented in this particular technical report cover data for 2004.

A total of 33 countries, including 24 EU Member States, provided air quality data for 2004. Luxembourg is the only EU Member State not providing information. As in preceding years, a large number of time series were transmitted, covering, for example, sulphur dioxide (SO_2), nitrogen dioxide (NO_2), particulate matter (PM_{10}), ozone (O_3), carbon monoxide (CO) and benzene (C_6H_6). Nearly all the countries that have updated their meta information used the Air Quality Data Exchange Module (AQ-DEM), made available for this purpose by the European Topic Centre on Air and Climate Change (ETC/ACC).

Several quality checks have been performed. In 2004 ETC/ACC has developed a QA/QC plan (see Buijsman *et al*, 2004a). The procedures and the first QA/QC checks are described in a report (see Mol *et al*, 2005b). In addition to the yearly QA/QC checks on the delivered EoI-data (outliers, missing essential meta data, possible overwriting of data already stored in AIRBASE, possible deletion of stations and measurement configurations with data) also QA/QC checks are performed on questionable station coordinates and questionable station characteristics.

Intensive feedback took place with the data suppliers on these items. The results of this feedback are also reported in this report.

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1. INTRODUCTION

Countries of the European Union have a long tradition of exchanging air quality data. The reciprocal exchange among countries and the Commission is based on a series of Council Decisions. The latest Decision (97/101/EC) 'establishing a reciprocal exchange of information and data from networks and individual stations measuring ambient air pollution within the Member States', the so-called Exchange of Information (EoI), was adopted by the European Council in 1997 (EU, 1997). The annexes to the Decision have been amended to adapt the list of pollutants covered to changes and requirements on additional information, validation and aggregation (EU 2001a, EU 2001b). Data submission followed the Guidance on the revised Annexes of the Decision (Garber *et al.*, 2001).

Parallel to dataflow under the EoI, the EU Member States provide information on air quality in the framework of the Air Quality Framework (FWD) and related daughter directives (EU 1999, EU 2000, EU 2002, EU2004). This information mainly focuses on compliance checking with obligations under the air quality directives, such as limit values. To avoid duplicate reporting by the Member States, some of the data that is needed for evaluating the reports under the FWD (in particular the meta-information on stations and networks) is only sent under the EoI. A recent assessment of these FWD –reports is available from the Commission Web site [1]

The Exchange of Information (EoI) requires a large set of meta information to be delivered to the Commission by the EU member states. The non-EU Member States, who are (candidate) members of the European Environment Agency (EEA), have also been asked to deliver data in the framework of the EUROAIRNET programme. Part of this information is mandatory and the other items are to be delivered to the Commission 'to the extent possible' and 'as much information as feasible should be supplied'[2].

According to the EoI Decision, the Commission will, each year, prepare a technical report on meta information and air quality data exchanged, and make the information available to EU Member States. The decision states that the Commission will call on the European Environment Agency (EEA) with regard to the operation and practical implementation of the information system. The European Topic Centre on Air and Climate Change (ETC/ACC), under contract to EEA, manages the database system, AIRBASE. The information submitted under the EoI is stored in AIRBASE and made available to the public on Internet via the ETC/ACC website[3].

The technical reports, both on transmitted meta information and transmitted air quality data flows, have been combined into this report. As agreed with the Commission and the EEA, the ETC/ACC has prepared the report and loaded the information into the AIRBASE database. This report shows information provided by EU-25 Member States except Luxembourg. In addition it contains information from 9 other EEA member countries and cooperating countries. These countries include the EU Acceding and EEA candidate member countries and the EFTA countries[4]), who have agreed to follow the data exchange procedures.

This report also reports on the QA/QC aspects of the data in AIRBASE. In 2004 ETC/ACC has developed a QA/QC plan (see Buijsman *et al*, 2004a). The procedures and the first QA/QC checks are described in a report (see Mol *et al*, 2005b).

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[1] http://ec.europa.eu/environment/air/zones_member_states.htm
[2] See Annex A for overview.
[3] http://airbase.eionet.europa.eu/
[4] EU25 Member States: Austria, Belgium, Denmark, Finland, Germany, Greece, Spain, France, Ireland, Italy, Luxembourg, The Netherlands, Portugal, Sweden, United Kingdom, Czech Republic, Estonia, Cyprus, Latvia, Lithuania, Hungary, Malta, Poland, Slovenia, Slovakia. EU Acceding Countries (EU-AC-3): Bulgaria, Romania, Turkey. EFTA Countries: Iceland, Liechtenstein, Norway and Switzerland. EEA candidate member countries : Albania, Bosnia and Herzegovina, FYROM (Former Yugoslavian Republic of Macedonia), Croatia and Serbia-Montenegro.

2. EXCHANGE OF INFORMATION 2005 (DATA FOR 2004)

2.1. QA/QC feedback actions

Several quality checks have been performed on delivered data and the already available information in AIRBASE. The procedures of these QA/QC checks are described in a report (see Mol *et al*, 2005b). In addition to the yearly QA/QC checks on the delivered EoI-data (outliers, missing essential[5] meta data, possible overwriting of data already stored in AIRBASE, possible deletion of stations and measurement configurations with data) also QA/QC checks are performed on questionable station coordinates and questionable station characteristics. More detailed information on the country feedbacks can be found in Annex F.

2.2. Results

Thirty three countries, including all EU-25 Member States except Luxembourg, provided air quality data for the reporting year, 2004 (see the status table in Annex E).

The delivery of data was facilitated by the Air Quality Data Exchange Module (AQ-DEM), developed by the ETC/ACC. This tool was used by most of the countries. Some countries provided their data in files in the EoI specified formats (DEM and ISO-7168-1: 1999 (extended) format). All data delivered for the reporting year 2004 was loaded into AIRBASE.

Transmitted data cover pollutants including mainly sulphur dioxide (SO_2), nitrogen dioxide (NO_2), nitrogen oxides (NO_x), ozone (O_3), carbon monoxide (CO), particulate matter (PM_{10}, $PM_{2.5}$), benzene (C_6H_6) and lead (Pb). Fewer time series were submitted for less commonly monitored components. Although this report includes the available information up to April 2006, data processing is an ongoing process, so please refer to the AIRBASE website [6] for the most recent overview of the progress in processing the data.

The number of reporting countries varied per component (*Table 1*). This ranged from 11 for lead to all 33 for nitrogen dioxide and ozone. The number of stations varied accordingly, being 160 for $PM_{2.5}$ and 2435 for nitrogen dioxide [7]. Consequently, the distribution and density of stations throughout Europe shows differences (*Figures 1 through 8)*. This holds as well for the number of stations per country (*Tables 2 and 3*). For completeness we have also added the number of stations with NO_x data (or if no NO_x data are available with NO_2 + NO data).

All stations with primary data (raw data with averages varying from hour to year) are taken into account in this report, regardless of the data coverage. For O_3 and CO only hourly concentration data are delivered and for Pb only daily values. For the other components SO_2, NO_2, PM_{10}, $PM_{2.5}$ and benzene hourly as well as daily concentration data are available; SO_2 and NO_2 data are delivered mainly as hourly values. Also measurement data with other averaging times than hour and day have been delivered: SO_2 (weekly), NO_2 (weekly), PM_{10} (3hourly), Pb (weekly, monthly and yearly) and benzene (weekly, monthly and yearly).

Stations which have delivered only statistics are not included in this report. However, the meta information of these stations and the statistics are available in AIRBASE. This evaluation focus on components defined under the Framework Directive (and the three daughter directives). Most countries delivered more data than defined under the EoI. See Annex D for a summary of these supplementary components.

In comparison with 2003, the number of countries delivering data has been increased with 1 (Liechtenstein), so 33 countries have delivered data in the framework of the EoI2005. The number of stations for which data are reported has been increased for the components SO_2

[5] Essential meta data: station name, station coordinates and altitude, type of station and type of area.
[6] http://airbase.eionet.europa.eu
[7] Information on the change in the number of stations per pollutant in 2003 and 2004 and the type of stations per country in 2004 is given in Annex B.

(+21), NO_2 (+119),PM_{10} (+206), $PM_{2.5}$ (+69), CO(+13), benzene (+98) and O_3 (+96) and has been decreased for the component Pb (-21).

Table 1 Number of stations per pollutant and station type, 2004

	Daughter directive 1.				2.		3.		
	Sulphur dioxide	Nitrogen dioxide	Nitrogen oxides Or Nitrogen dioxide + Nitrogen monoxide	Particulate matter (<10 µm)	Particulate matter (< 2.5 µm)	Lead	Carbon monoxide	Benzene	Ozone
EU-25 countries (24 reporting countries)	**24**	**24**	**24**	**24**	**14**	**9**	**24**	**19**	**24**
Total number of stations	**1857**	**2304**	**2078**	**1803**	**150**	**119**	**1026**	**373**	**1813**
Of which									
Traffic	401	662	607	538	37	33	536	187	309
Urban background	688	889	790	745	71	53	342	126	773
Industrial	386	305	259	232	4	17	89	31	177
Regional background	285	320	858	194	20	16	36	23	431
Other [1]	97	128	122	94	18	0	23	6	123
non-EU-25 countries (9 reporting countries)	**8**	**9**	**9**	**8**	**3**	**2**	**8**	**5**	**9**
Total number of stations	**151**	**131**	**68**	**81**	**10**	**20**	**50**	**14**	**79**
Of which									
Traffic	36	37	24	27	7	2	23	9	22
Urban background	75	60	25	33	3	12	15	4	26
Industrial	25	19	10	12		5	9		11
Regional background	14	14	19	8		1	2	1	19
Other [1]	1	1	1	1	0	0	1	0	1
Total reporting countries	32	33	36	32	17	11	32	24	33
Total number of stations	**2008**	**2435**	**2146**	**1884**	**160**	**139**	**1076**	**387**	**1892**

1) Primarily unknown.

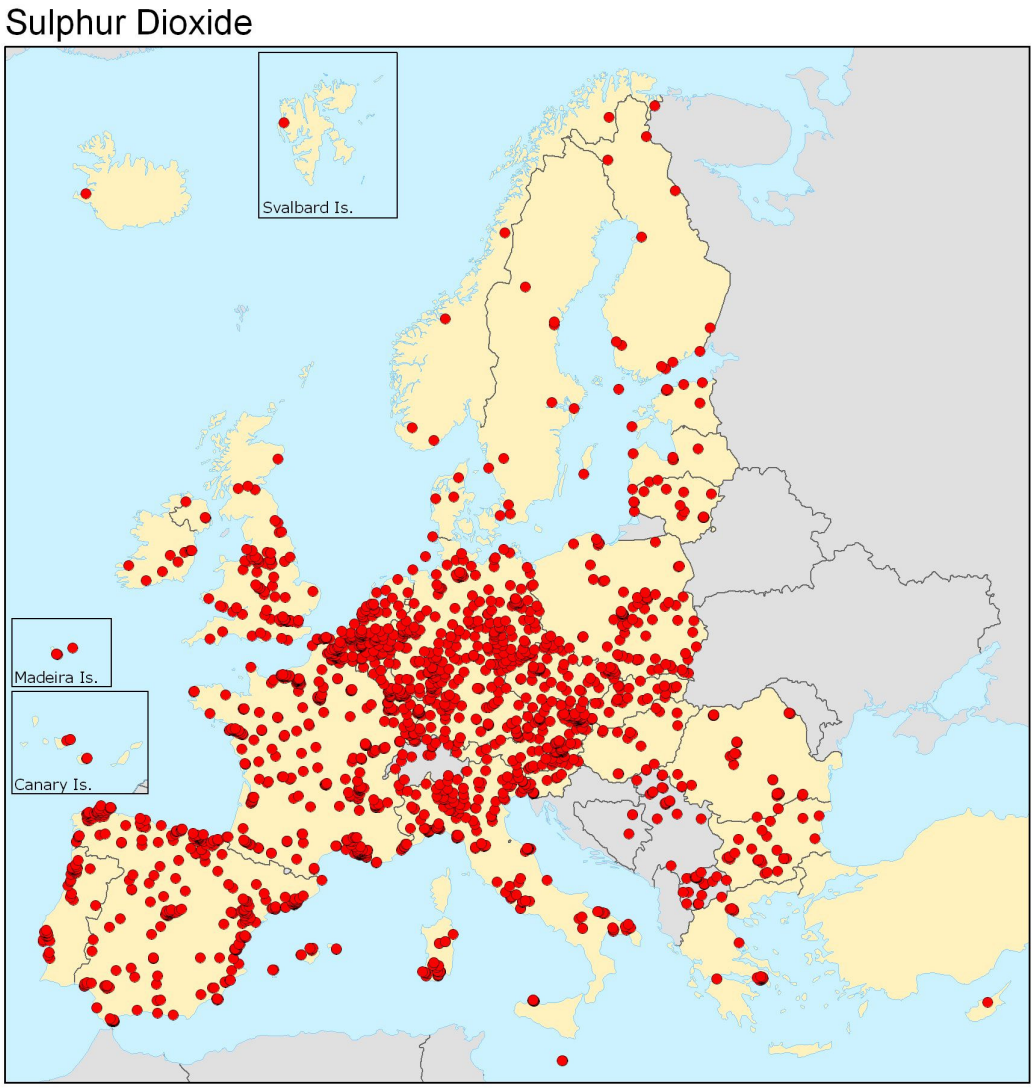

Figure 1 Location of stations for which 2004 air quality data for sulphur dioxide (SO_2) have been reported.

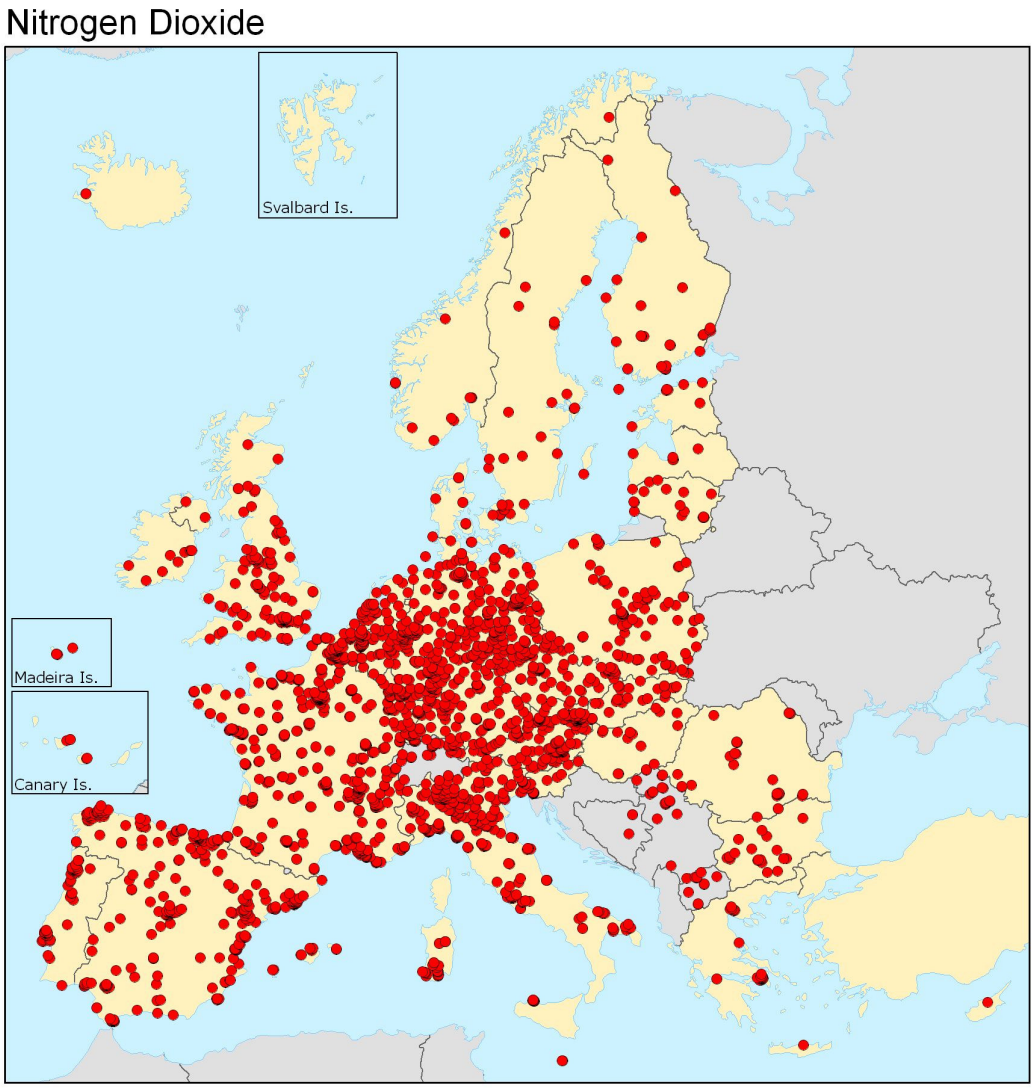

Figure 2 Location of stations for which 2004 air quality data for nitrogen dioxide (NO_2) have been reported.

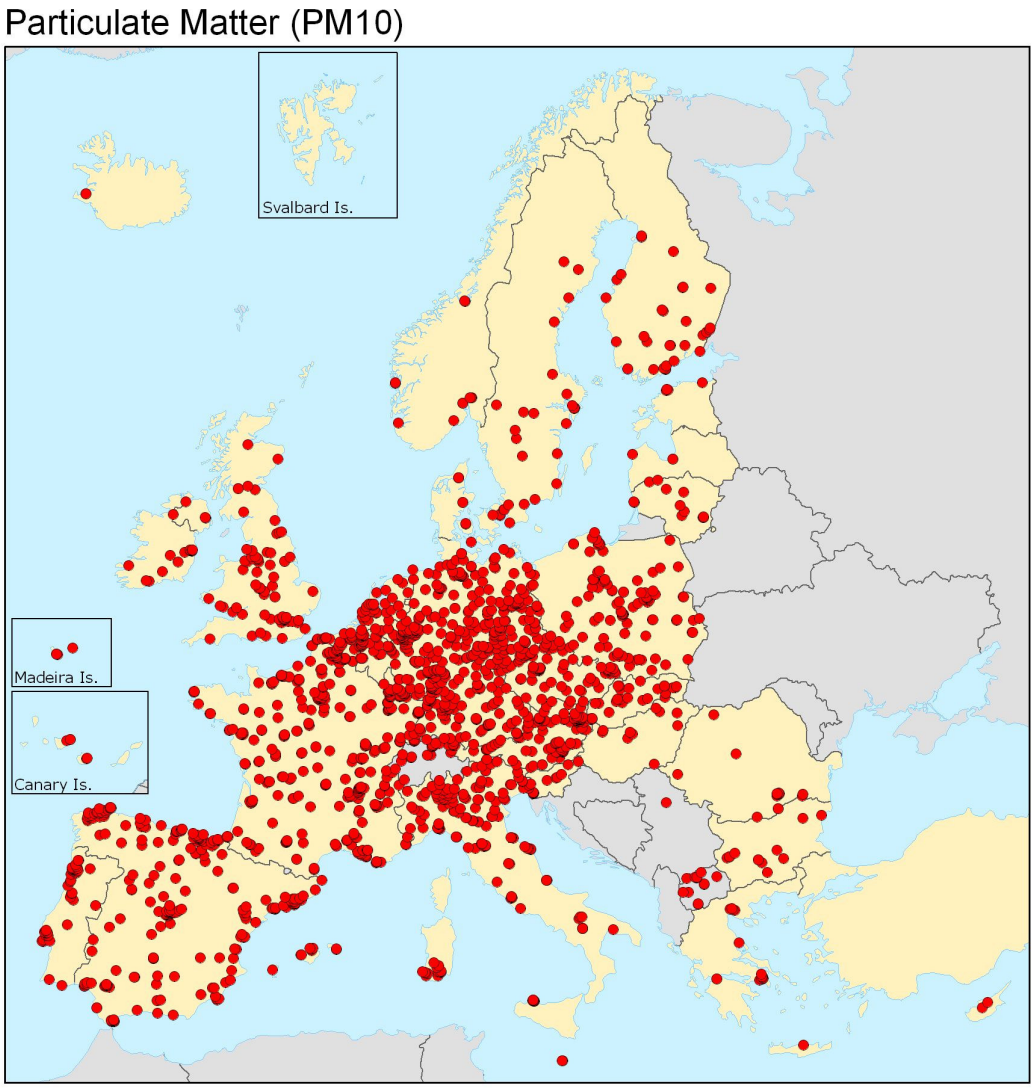

Figure 3 Location of stations for which 2004 air quality data for particulate matter (PM_{10}) have been reported.

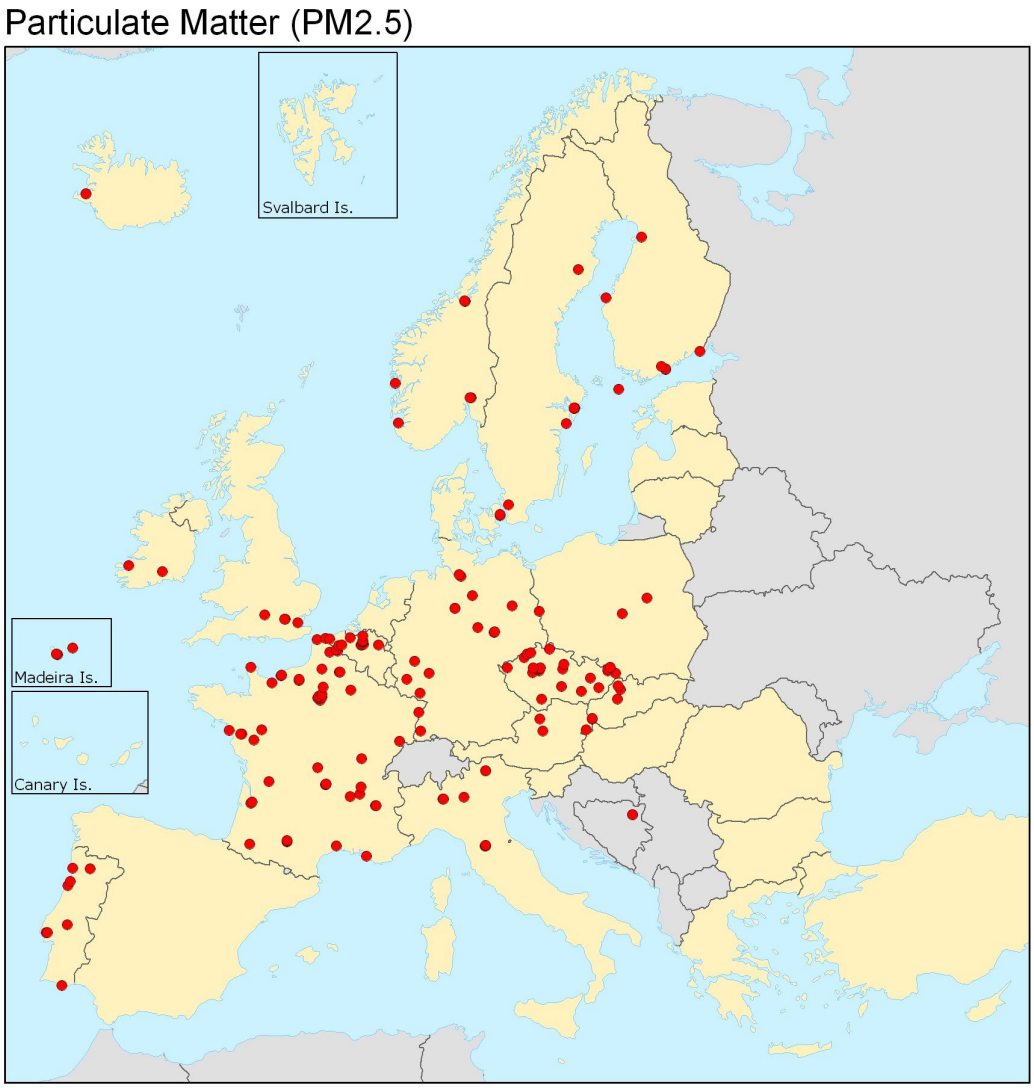

Figure 4 Location of stations for which 2004 air quality data for particulate matter ($PM_{2.5}$) have been reported.

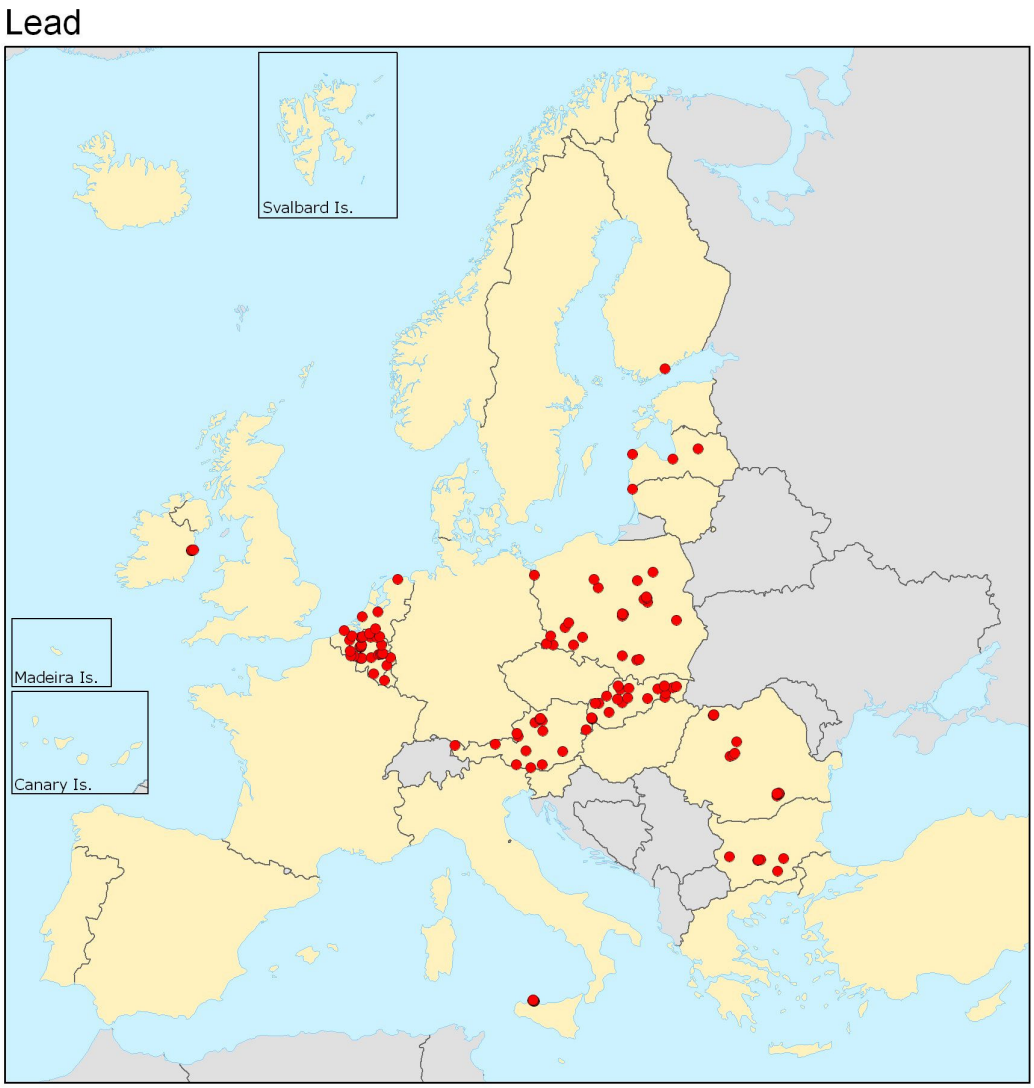

Figure 5 Location of stations for which 2004 air quality data for lead (Pb) have been reported.

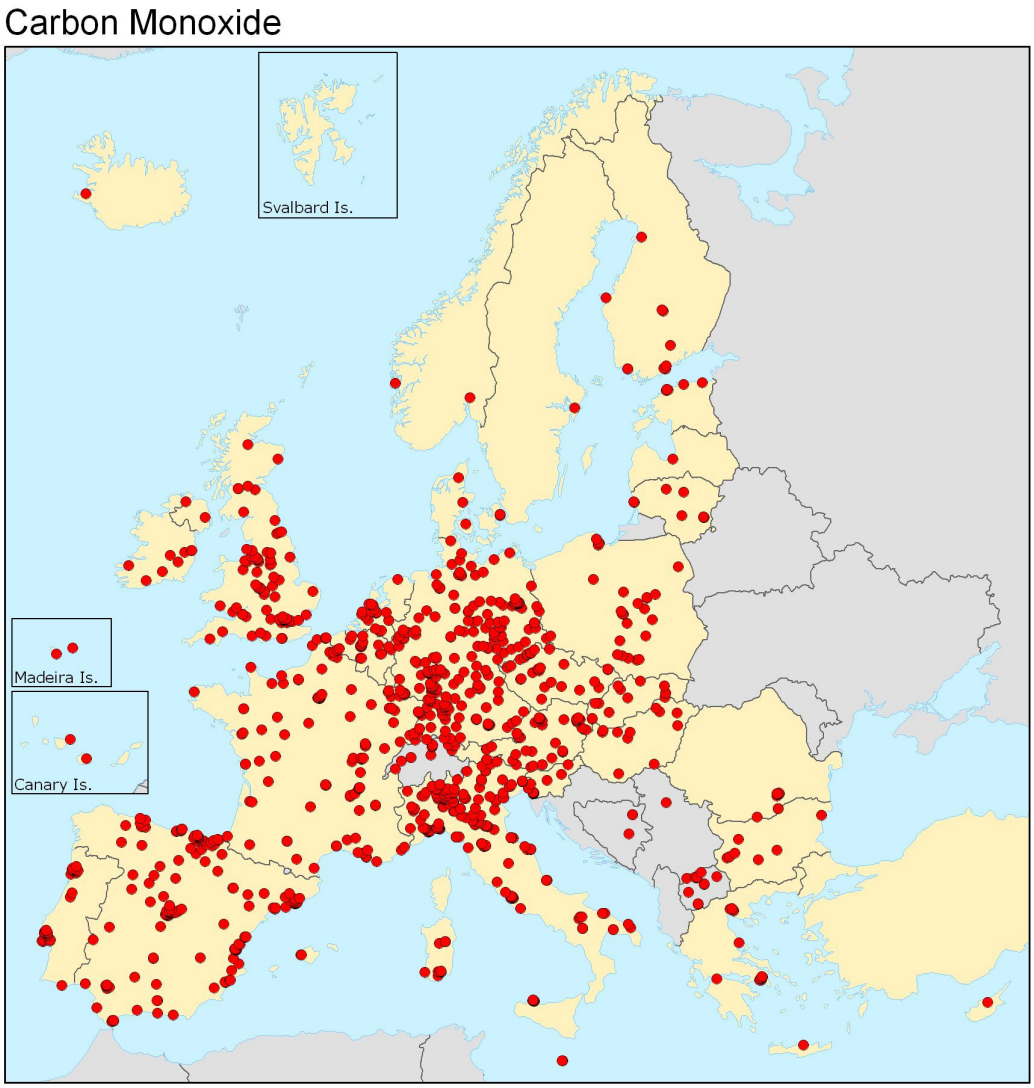

Figure 6 Location of stations for which 2004 air quality data for carbon monoxide (CO) have been reported.

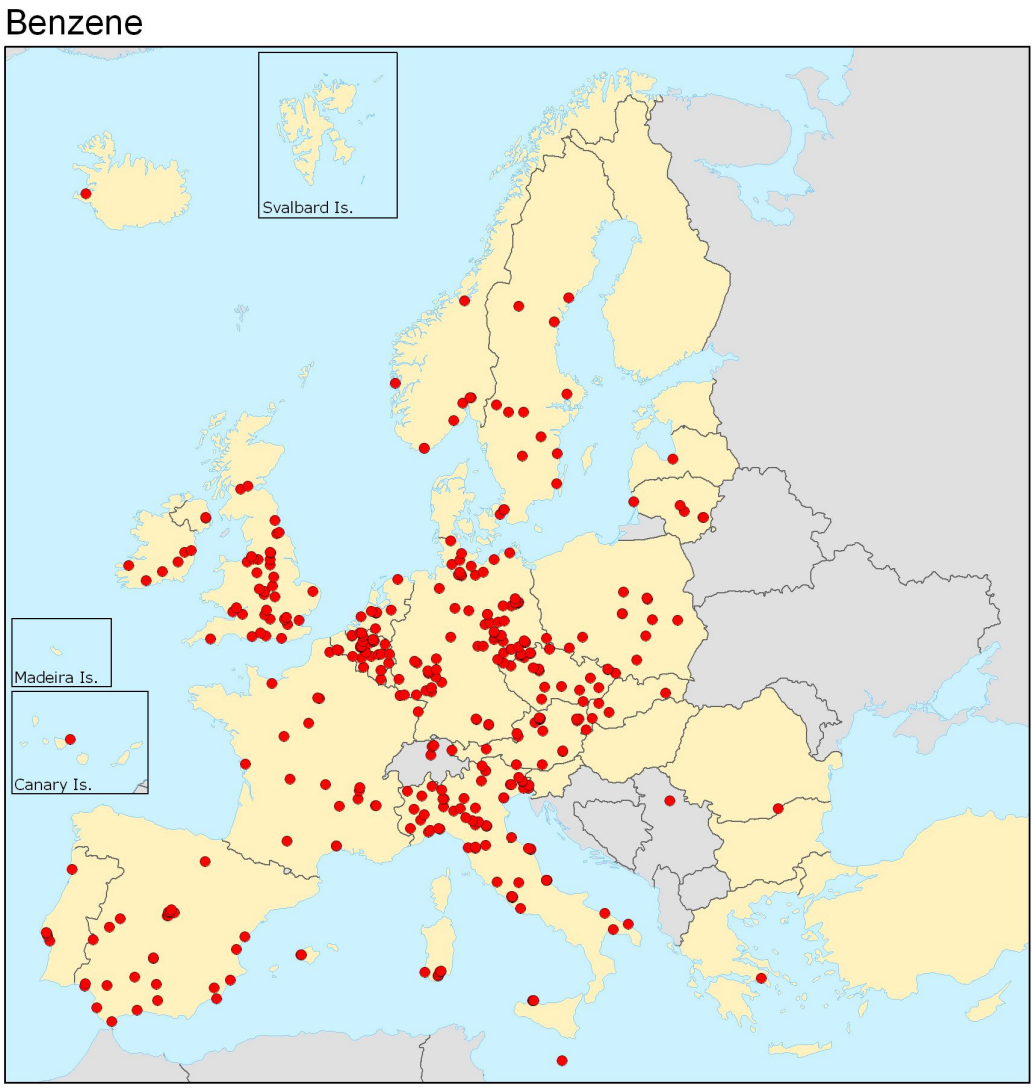

Figure 7 Location of stations for which 2004 air quality data for benzene (C_6H_6) have been reported.

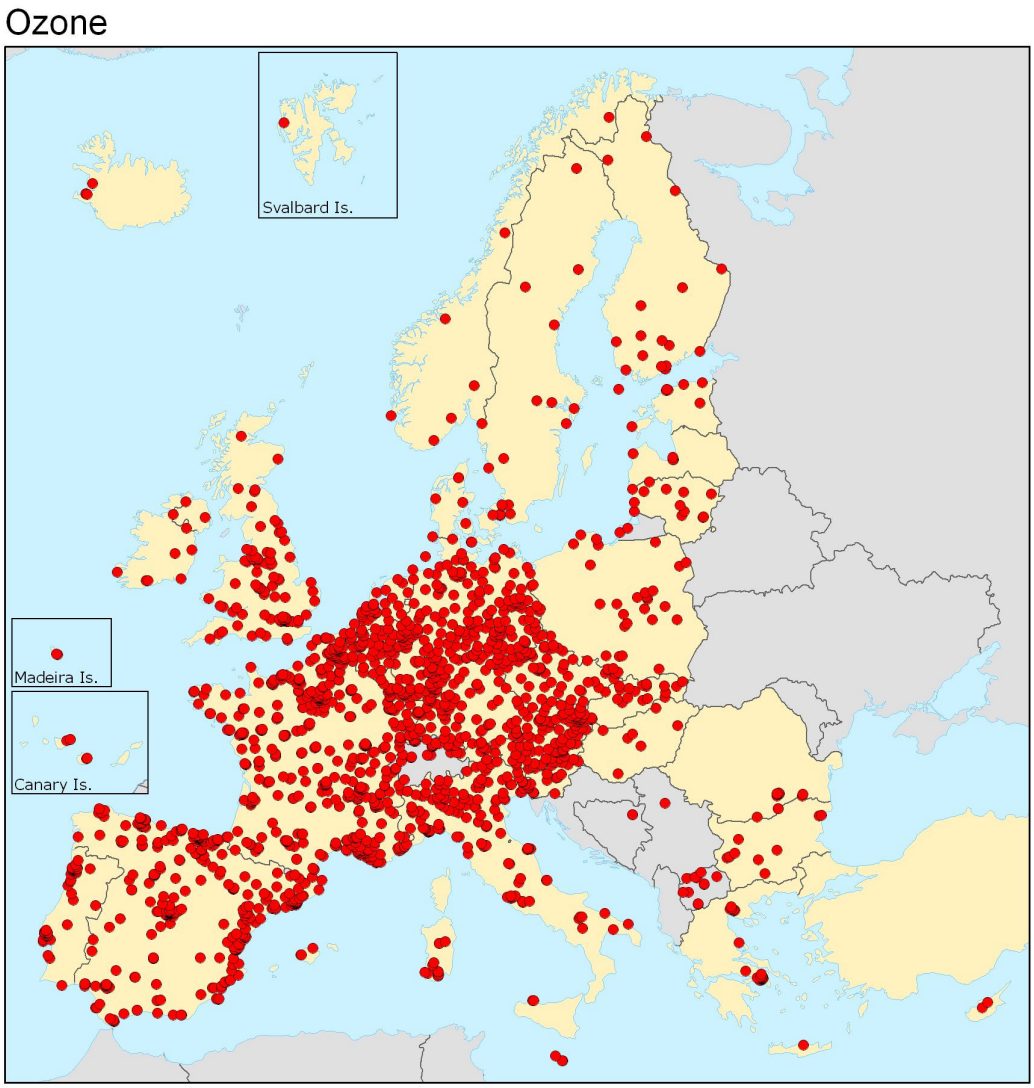

Figure 8 Location of stations for which 2004 air quality data for ozone (O_3) have been reported.

Table 2 Number of stations in the EU-25 countries for which 2004 data is available for components of the daughter directives.

Daughter directive	1	.	.	.	.	.	2	.	3
	Sulphur dioxide	Nitrogen dioxide	Nitrogen oxides or Nirogen dioxide + Nitrogen monoxide	Particulate matter (<10 µm)	Particulate matter (<2.5 µm)	Lead	Carbon monoxide	Benzene	Ozone
Formula (or abbreviation)	SO_2	NO_2	NO_x/NO	PM_{10}	$PM_{2.5}$	*Pb*	*CO*	C_6H_6	O_3
Austria	124	151	151	106	3	15	46	19	116
Belgium	74	56	56	42	12	39	18	30	37
Cyprus	1	1	1	2			1		2
Czech Republic	72	74	74	70	22		30	21	50
Denmark	5	14	14	12	2		6	1	11
Estonia	7	7	7	4			5		7
Finland	12	29	27	33	7	1	11		18
France	419	518	511	350	50		109	25	463
Germany	283	431	431	400	15		218	73	321
Greece	22	28	28	16			15	1	25
Hungary	14	14	13	10			11		7
Ireland	9	9	9	14	2	5	8	6	7
Italy	212	306	215	168	8	7	209	77	165
Latvia	6	6		3		4	1	1	5
Lithuania	16	16	8	12			8	5	12
Luxembourg [1)]									
Malta	2	2	2	2			2	1	3
Netherlands	36	44	44	37		4	21	9	36
Poland	80	91	40	103	2	23	27	11	36
Portugal	45	53	46	47	12		36	5	44
Slovakia	26	26		26	5	21	12	4	20
Slovenia	8	6	6	7			4		10
Spain	295	287	283	240			146	31	316
Sweden	10	24	1	25	6		1	13	14
United Kingdom	79	111	111	74	4		81	40	88
All countries	**1857**	**2304**	**2078**	**1803**	**150**	**119**	**1026**	**373**	**1813**

1) No information received.

Table 3 Number of stations in non- EU-25 countries for which 2004 data is available for components of the daughter directives

Daughter directive	1	.	.	.	.	.	2	.	3
	Sulphur dioxide	Nitrogen dioxide	Nitrogen oxides or Nirogen dioxide + Nitrogen monoxide	Particulate matter (<10 µm)	Particulate matter (<2.5 µm)	Lead	Carbon monoxide	Benzene	Ozone
Formula (or abbreviation)	*SO_2*	*NO_2*	*NO_x/NO*	*PM_{10}*	*$PM_{2.5}$*	*Pb*	*CO*	*C_6H_6*	*O_3*
Albania [1]									
Bosnia and Herzegovina	3	3	1		2		3		2
Bulgaria	27	20	7	13		6	8		10
FYROM[3]	37	12	12	13			12		11
Iceland	1	2	2	2	2		1	1	4
Liechtenstein [2]		1	1	1					1
Norway	7	12	5	11	6		2	8	9
Romania	38	30	12	16		14	11	1	13
Serbia-Montenegro	23	22	3	1			1	1	1
Switzerland	15	29	25	24			12	3	28
Turkey [2]									
All countries	**151**	**131**	**68**	**81**	**10**	**20**	**50**	**14**	**79**

1) No information received
2) New in EoI2005
3) Former Yugoslavian Republic of Macedonia

2.3. Time series

The total number of stations with raw data which are operational in 2004 is 3466 (see table 4).

Long-term measurement series provide valuable information for determining, for example, the effect of abatement measures and trend analysis. Since AIRBASE became operational in 1996, the average length of the time series in AIRBASE is relatively short (see Table 5 and Figure 9). However, as one of the long-term objectives is to expand the time series in AIRBASE, further improvement can be expected. More information about data series can be found in annex C.

Note that the length of the time series in years in table 5, figure 9 and annex C are calculated regardless of the data capture in a year. If there is a gap of one or more years, the maximum length of time series is taken. For the average length of time series all stations available in AIRBASE are included. This way to calculate the average length of time series doesn't give always a good picture. For example, if a country has new stations (with 1 year time series of data), the average length of time series can decrease substantially. This could be an explanation of overall decrease of the average length of time series for Ozone (-0.4) and CO (-1.3) in table 5 in comparison with the situation in 2003 in spite of increase of the number of stations. The average length of time series for Pb has also been decreased (-0.3).

Strictly speaking, the air quality daughter directives define criteria for minimum data capture, *i.e.* 90% (EU, 1999 and EU, 2000) or, in a single case, a differentiated set of criteria (EU, 2002). Indeed, data capture is a general measure for the performance of a complete monitoring system but not necessarily a sufficient indicator for the quality of the data set. The relation between the quality of aggregated data and data capture is often not straightforward and, judging the quality of the time series on the basis of the data capture alone is not recommended [8].

[8] For instance, a low data capture could result in an annual average with an acceptable quality, whereas the estimation of higher percentiles based on the same low data capture could lead to values with higher uncertainty.

Table 4 Summary of periods and number of stations for which data are available in AIRBASE

Country	Start year air quality reporting (end year = 2004)	Number of operational stations in 2003 [1]	Number of operational stations in 2004 [1]
EU-25 countries			
Austria	1990	191	189
Belgium	1985	150	180
Cyprus	2003	2	2
Czech Republic	1992	67	78
Denmark	1976	17	16
Estonia	1997	7	7
Finland	1990	58	60
France	1968	720	735
Germany	1976	488	477
Greece	1983	30	29
Hungary	1997	14	14
Ireland	1973	19	21
Italy	1976	320	360
Latvia	1997	10	9
Lithuania	1997	16	16
Luxembourg	1976 [4]	[3]	[3]
Malta	2002	1	3
Netherlands	1976	51	55
Poland	1997	47	155
Portugal	1986	46	59
Slovakia	1995	35	35
Slovenia	1997	9	10
Spain	1986	402	429
Sweden	1993	38	42
United Kingdom	1969	329	292
Total		3067	3273
Non-EU-25 countries			
Albania	[2]	.	.
Bosnia Herzegovina	2002 [5]	1	3
Bulgaria	1998	49	30
Croatia	[2]	.	
FYROM [6]	1997	31	40
Iceland	1993	3	4
Liechtenstein	2004	·	1
Norway	1994	19	24
Romania	2001	34	39
Serbia and Montenegro	2002	8	23
Switzerland	1992	27	29
Turkey	[2]	.	.
Total		172	193
Total EU + non-EU countries		3239	3466

1) Irrespective of the component(s) measured
2) No information in AIRBASE

3) No data delivered since 1994
4) End year = 1993
5) Data delivered until March 2005

6) Former Yugoslavian Republic of Macedonia

Table 5 Average length of time series for components of the air quality daughter directives [1].

Component	Length of time series	Component	Length of time series
	Year		*Year*
Sulphur dioxide	5.5	Lead	3.8
Nitrogen dioxide	5.3	Ozone	5.6
Particulate matter (<10 µm)	3.5	Carbon monoxide	4.7
Particulate matter (<2.5 µm)	2.0	Benzene	2.9

1) All (primary) AIRBASE data (raw data, not the derived data as statistics) of 33 countries have been taking account in calculating the average length of time series regardless of the starting year.

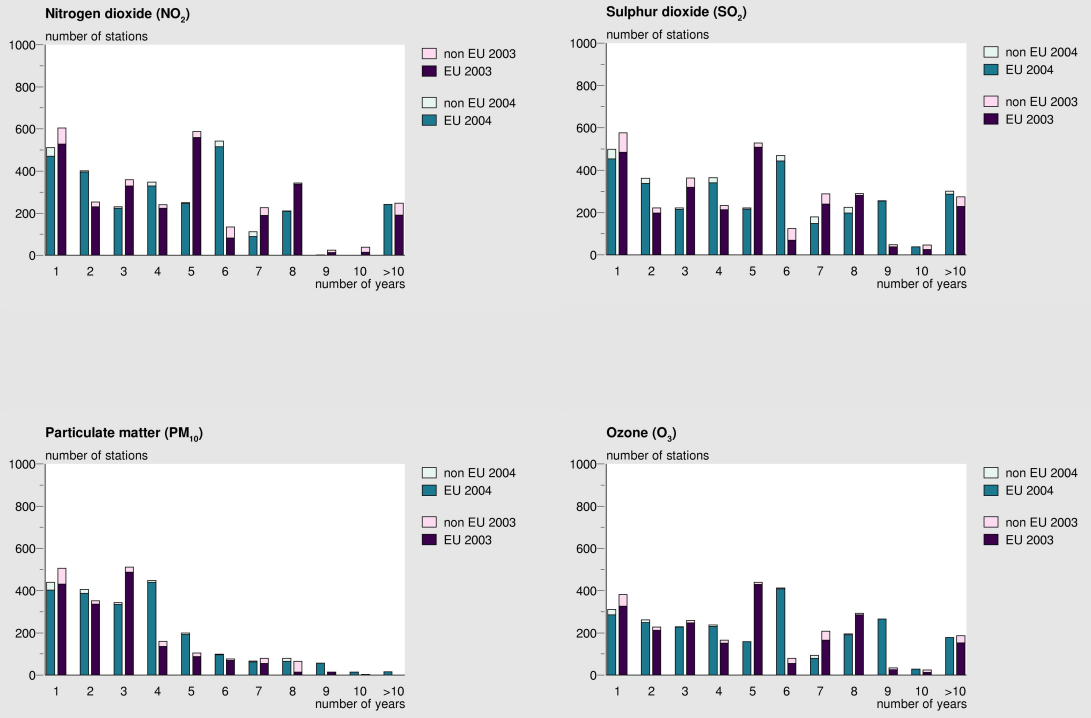

Figure 9 Length of time series (in years) in AIRBASE for sulphur dioxide, nitrogen dioxide, ozone and particulate matter (<10 µm).

2.4. Total number of stations in AIRBASE

Since its introduction in 1997 AIRBASE has grown into a database which nowadays contains air quality data from 34 European countries for the years ranging from 1968 (France) to 2004 for many pollutants. The total number of stations in AIRBASE is 5585, from which 5147 stations have measurement data. The 438 stations without data are partially stations for which meta information has been delivered but no measurement data (Germany) and partially stations for which measurement data will be delivered (e.g. United Kingdom). The so-called phantom stations (stations with unknown status, originating from the old Girafe and Apis databases) have been removed from AIRBASE. In spite of the EoI obligation to send only raw data or raw data combined with statistics, there are 279 stations with only statistics in AIRBASE. Summarized, in AIRBASE we have:

4868	stations with raw data
279	stations with only statistics
5147	stations with data
438	stations without data
5585	stations in total

Information on stations with missing essential information, see Annex C2.

3. CONCLUSIONS & RECOMMENDATIONS

The EoI2005 data cycle was very successful. A total of 33 countries, including 24 EU Member States, has provided air quality data for 2004. In comparison with the EoI2004, the number of countries delivering data has been increased with 1 (Liechtenstein) and the number of stations for which data have been reported has been increased from 3239 to 3466 stations. The spatial station coverage of $PM_{2.5}$ is still insufficient. Only on 160 stations $PM_{2.5}$ measurement data have been reported. According to the reporting under the Framework Directive, 244 PM2.5 stations are operational in 2004; a further extension of the number of PM2.5 station is to be expected.Not for all NO_2 stations, NO (or NO_x) is reported. This is surprising as most automated monitors measure both pollutants simultaneously.
Nearly all countries have delivered the data in time before 1th of October 2005. ETC/ACC has produced QA/QC country feedback reports. The response on these reports was very good. The quality of the meta information and measurement data in AIRBASE has been improved considerably.
Future improvements of the EoI data delivery include:

- Information on the PM10 corrections factors has been updated until the 2003-data (see de Leeuw, 2005). An update on the 2004-data and the next EoI2006 (2005-data) has to be performed. In the next DEM (version 9) a facility will be build to check, modify and add PM_{10} and $PM_{2.5}$ correction factors.
- In order to process also 4th DD pollutants (Arsenic, Cadmium, Mercury, Nickel and Polycyclic Aromatic Hydrocarbons in ambient air) in the DEM, the DEMv9 will be adapted to import irregular time series.

4. REFERENCES

Buijsman E., De Leeuw F.A.A.M., Van Hooydonk, P., De Smet, P., Mol, W. (2004a): QA/QC plan for air quality data collecting under the Exchange of Information decision. Final draft. European Topic Centre on Air and Climate Change, Bilthoven, The Netherlands. See http://air-climate.eionet.europa.eu/meetings

Buijsman E., De Leeuw F.A.A.M (2004b): Correction factors and PM_{10} measurements. Document on the 9th EIONET Workshop on Air Quality Management and Assessment in Oslo 2004, European Topic Centre on Air and Climate Change, Bilthoven, The Netherlands. See http://air-climate.eionet. europa.eu/meetings

EU. 1997. Council Decision of 27 January 1997 establishing a reciprocal exchange of information and data from networks and individual stations measuring ambient air pollution within the Member States (97/101/EC). Official Journal L 035, 05/02/1997, pp. 14-22. See http://ec.europa.eu/environment/air/ambient.htm

EU. 1999. Council Directive 1999/30/EC of 22 April 1999 relating to limit values for sulphur dioxide, nitrogen dioxide and oxides of nitrogen, particulate matter and lead in ambient air (99/30/EC). Official Journal L 163, 29/06/1999, pp. 41–60. See http://ec.europa.eu/environment/air/ambient.htm

EU. 2000. Directive 2000/69/EC of the European Parliament and of the Council of 16 November 2000 relating to limit values for benzene and carbon monoxide in ambient air. Official Journal L 313, 13/12/2000, pp. 12–21. See http://ec.europa.eu/environment/air/ambient.htm

EU. 2001a. Commission Decision of 17 October 2001 amending the Annexes to Council Decision 97/101/EC establishing a reciprocal exchange of information and data from networks and individual stations measuring ambient air pollution within the Member States (2001/752/EC). Official Journal L 282, 26/10/2001, pp. 69–76. See http://ec.europa.eu/environment/air/ambient.htm

EU. 2001b. Corrigendum to Commission Decision 2001/752/EC of 17 October 2001 amending the Annexes to Council Decision 97/101/EC establishing a reciprocal exchange of information and data from networks and individual stations measuring ambient air pollution within the Member States. Official Journal L 334, 18/12/2001, pp. 35. See http://ec.europa.eu/environment/air/ambient.htm

EU.2002. Directive 2002/3/EC of the European Parliament and the Council of 12 February 2002 relating to ozone in ambient air. Official Journal L 67, 9/03/2002, pp. 14–30. See http://ec.europa.eu/environment/air/ambient.htm

EU.2004. Directive 2004/107/EC of the European Parliament and the Council of 15 December 2004 relating to arsenic, cadmium, mercury, nickel and polycyclic aromatic hydrocarbons in ambient air. Official Journal L 23, 26/01/2005, pp. 3–16. See http://ec.europa.eu/environment/air/ambient.htm

Garber W, Colosio J, Grittner S, Larssen S, Rasse D, Schneider J, Houssiau M. 2001. Guidance on the Annexes to Decision 97/101/EC on Exchange of Information as revised by Decision 2002/752/EC. European Commission, DG Environment, Brussels.

Leeuw, F.A.A.M. (2005): PM10 measurement methods and correction factors in AirBase 2004 status report. ETC/ACC Technical Paper 2005/6. Available at http://etc-acc.eionet.europa.eu/reports

Mol, W.J.A., De Leeuw, F.A.A.M. (2005a): AirBase: A Valuable Tool in Air Quality Assessments in: The Proceedings of the 5th International Conference on Urban Air

Quality, Valencia Spain 29-31 March 2005, Editors R.S. Sokhi, M.M. Millán and N. Moussiopoulos.

Mol, W.J.A., Van Hooydonk P.R. (2005b): QA/QC checks on air quality data in AirBase and on the EoI2004 data – Procedures and results. ETC/ACC Technical Paper 2005/3. Available at http://etc-acc.eionet.europa.eu/reports

Mol, W.J.A. (2005c): AirBase – potentials and developments. ETC/ACC Technical Paper 2005/4. Available at http://etc-acc.eionet.europa.eu/reports

Annex A Exchange of Information requirements

The Member States of the European Union should, according to Annex II of the Council Decision on the reciprocal exchange of information, report certain types of meta information (EU, 2001a). Part of the information, as mentioned in Annex II, is mandatory (*Table A1*). The other information should be delivered 'to the extent possible' and 'as much as feasible' (*Table A2).*

Table A.1 Overview of mandatory meta information to be delivered under the Exchange of Information (EoI)

Item [a]	Description
I.1.	Name of the network
I.4.1.	Name of the body responsible for network management
I.4.2.	Name of person responsible
I.4.3.	Address
I.4.4.	Telephone and fax numbers
I.5.	Time reference basis
II.1.1.	Name of the station
II.1.4.	Station code given under the present decision and to be provided by the Commission
II.1.8.	Geographical co-ordinates
II.1.10.	Pollutants measured
II.1.11.	Meteorological parameters measured
II.2.1.	Type of area

(a) Numbers according to Annex II of the EoI (EU, 2001a)

Table A.2. Overview of non-mandatory meta information to be delivered under the Exchange of Information (EoI)

Item [a]	Description
I.2.	Abbreviation (of the network)
I.3.	Type of networks
I.4.5.	E-mail (of the body responsible for the network)
I.4.6.	Website address
II.1.2.	Name of the town/city of location (of the station)
II.1.3.	National and/or local reference number or code
II.1.5.	Name of technical body responsible for the station
II.1.6.	Bodies or programmes to which data are reported
II.1.7.	Monitoring objectives
II.1.9.	NUTS level IV
II.1.12	Other relevant information
II.2.2.	Type of station in relation to dominant emission sources
II.2.3.	Additional information about the station
III.1.1.	Name (of measurement equipment)
III.1.2.	Analytical principle or measurement method
III.2.1.	Location of sampling point
III.2.2	Height of sampling point
III.2.3	Result-integrating time
III.2.4	Sampling time

(a) Numbers according to the Annex II of the Exchange of Information (EU, 2001a).

Table A.3 Overview of mandatory pollutants to be delivered under the Exchange of Information (EoI)

EoI nr.	Formula	Name of pollutant	Units of measurement	Average over
1	SO_2	Sulphur dioxide	ug/m3	1 h
2	NO_2	Nitrogen dioxide	ug/m3	1 h
3	PM_{10}	Particulate matter < 10 µm	ug/m3	24 h
4	$PM_{2.5}$	Particulate matter < 2.5 µm	ug/m3	24 h
5	SPM	Total suspended particulates	ug/m3	24 h
6	Pb	Lead	ug/m3	24 h
7	O_3	Ozone	ug/m3	1 h
8	C_6H_6	Benzene	ug/m3	24 h
9	CO	Carbon monoxide	mg/m3	1 h
10	Cd	Cadmium	ng/m3	24 h
11	As	Arsenic	ng/m3	24 h
12	Ni	Nickel	ng/m3	24 h
13	Hg	Mercury	ng/m3	24 h
14	BS	Black smoke	ug/m3	24 h
15	NO_X	Nitrogen oxides	ug NO2/m3	1 h

Table A.4 Overview of other pollutants to be delivered under the Exchange of Information (EoI) if available

EoI nr.	Formula	Name of pollutant	Units of measurement	Average over
16	$C2H_6$	Ethane	ug/m3	24 h
17	$H_2C=CH_2$	Ethene (Ethylene)	ug/m3	24 h
18	HC=CH	Ethyne (Acetylene)	ug/m3	24 h
19	$H_3C-CH_2-CH_3$	Propane	ug/m3	24 h
20	$CH_2=CH-CH_3$	Propene	ug/m3	24 h
21	$H_3C-CH_2-CH_2-CH_3$	n-Butane	ug/m3	24 h
22	$H_3C-CH(CH_3)_2$	i-Butane	ug/m3	24 h
23	$H_2C=CH-CH_2-CH_3$	1-Butene	ug/m3	24 h
24	$H_3C-CH=CH-CH_3$	trans-2-Butene	ug/m3	24 h
25	$H_3C-CH=CH-CH_3$	cis-2-Butene	ug/m3	24 h
26	$CH_2=CH-CH=CH_2$	1.3 Butadiene	ug/m3	24 h
27	$H_3C-(CH_2)_3-CH_3$	n-Pentane	ug/m3	24 h
28	$H_3C-CH_2-CH(CH_3)_2$	i-Pentane	ug/m3	24 h
29	$H_2C=CH-CH_2-CH_2-CH_3$	1-Pentene	ug/m3	24 h
30	$H_3C-HC=CH-CH_2-CH_3$	2-Pentenes	ug/m3	24 h
31	$CH_2=CH-C(CH_3)=CH_2$	Isoprene	ug/m3	24 h
32	$C_{36}H_{14}$	n-Hexane	ug/m3	24 h
33	$(CH_3)_2-CH-CH_2-CH_2-CH_3$	i-Hexane	ug/m3	24 h
34	C_7H_{16}	n-Heptane	ug/m3	24 h
35	C_8H_{18}	n-Octane	ug/m3	24 h
36	$(CH_3)_3-C-CH_2-CH-(CH_3)_2$	i-Octane	ug/m3	24 h
37	$C_6H_5-CH_3$	Toluene	ug/m3	24 h
38	$C_6H_5-C_2H_5$	Ethyl benzene	ug/m3	24 h
39	m,p-$C_6H_4(CH_3)_2$	m,p-Xylene	ug/m3	24 h
40	o-$C_6H_4-(CH_3)_2$	o-Xylene	ug/m3	24 h
41	$C_6H_3-(CH_3)_3$	1,2,4-Trimethylbenzene	ug/m3	24 h
42	$C_6H_3(CH_3)_3$	1,2,3-Trimethylbenzene	ug/m3	24 h
43	$C_6H_3(CH_3)_3$	1,3,5-Trimethylbenzene	ug/m3	24 h
44	HCHO	Formaldehyde	ug/m3	1 h
45	THC (NM)	Total non-methane hydrocarbons	ug C/m3	24 h
46	SA	Strong acidity	ug SO2/m3	24 h
47	PM1	Particulate matter < 1 µm	ug/m3	24 h
48	CH_4	Methane	ug/m3	24 h
49	Cr	Chromium	ng/m3	24 h
50	Mn	Manganese	ng/m3	24 h
51	H_2S	Hydrogen sulphide	ug/m3	24 h
52	CS_2	Carbon disulphide	ug/m3	1 h
53	$C_6H_5-CH=CH_2$	Styrene	ug/m3	24 h
54	$CH_2=CH-CN$	Acrylonitrile	ug/m3	24 h
55	$CHCl=CCl_2$	Trichloroethylene	ug/m3	24 h
56	C_2Cl_4	Tetrachloroethylene	ug/m3	24 h
57	CH_2Cl_2	Dichloromethane	ug/m3	24 h
58	BaP	Benzo(a)pyrene	ug/m3	24 h
59	VC	Vinyl chloride	ug/m3	24 h
60	PAN	Peroxyacetyl nitrate	ug/m3	1 h
61	NH_3	Ammonia	ug/m3	24 h
62	N-DEP	Wet nitrogen deposition	mg N/(m2*month)	1 month
63	S-DEP	Wet sulphur deposition	mg S/(m2*month)	1 month

Annex B Total number of stations per pollutant in 2003 and 2004 and number of stations per pollutant and per type of station in 2004

Table B1 Total number of SO_2 stations in 2003 and 2004 and the type of SO_2 stations in 2004

Country	**Total number of stations 2003**	**Total number of stations 2004**	Traffic	Urban back-ground	Industrial	Regional back-ground	Unknown
EU-25 countries							
Austria	**133**	**124**	23	37	21	43	0
Belgium	**74**	**74**	14	32	14	14	0
Cyprus	**1**	**1**	1	0	0	0	0
Czech Republic	**66**	**72**	16	38	1	17	0
Denmark	**8**	**5**	2	0	0	3	0
Estonia	**7**	**7**	1	1	2	3	0
Finland	**13**	**12**	2	0	4	6	0
France	**454**	**419**	27	166	102	30	94
Germany	**312**	**283**	53	124	29	75	2
Greece	**25**	**22**	11	7	4	0	0
Hungary	**13**	**14**	7	5	1	1	0
Ireland	**7**	**9**	6	3	0	0	0
Italy	**192**	**212**	76	55	65	15	1
Latvia	**6**	**6**	0	4	0	2	0
Lithuania	**16**	**16**	7	3	3	3	0
Malta	**0**	**2**	1	0	1	0	0
Netherlands	**32**	**36**	7	9	0	20	0
Poland	**42**	**80**	3	60	4	13	0
Portugal	**36**	**45**	13	23	4	5	0
Slovakia	**26**	**26**	6	19	1	0	0
Slovenia	**8**	**8**	3	4	0	1	0
Spain	**291**	**295**	113	33	125	24	0
Sweden	**10**	**10**	1	5	0	4	0
United Kingdom	**78**	**79**	8	60	5	6	0
Total EU-25 countries	**1850**	**1857**	**401**	**688**	**386**	**285**	**97**
Non-EU-25 countries							
Bosnia Herzegovina	**1**	**3**	2	1	0	0	0
Bulgaria	**45**	**27**	2	24	0	1	0
FYROM	**28**	**37**	15	12	9	1	0
Iceland	**1**	**1**	1	0	0	0	0
Norway	**8**	**7**	0	0	0	7	0
Romania	**34**	**38**	6	20	10	1	1
Serbia and Montenegro	**8**	**23**	6	12	5	0	0
Switzerland	**12**	**15**	4	6	1	4	0
Totall non- EU-25 countries	**137**	**151**	**36**	**75**	**25**	**14**	**1**
Total all countries	**1987**	**2008**	**437**	**763**	**411**	**299**	**98**

Table B2 Total number of NO_2 stations in 2003 and 2004 and the type of NO_2 stations in 2004

Country	**Total number of stations 2003**	**Total number of stations 2004**	Traffic	Urban back-ground	Industrial	Regional back-ground	Unknown
EU-25 countries							
Austria	**151**	**151**	50	47	15	39	0
Belgium	**55**	**56**	11	26	11	8	0
Cyprus	**1**	**1**	1	0	0	0	0
Czech Republic	**67**	**74**	18	38	1	17	0
Denmark	**12**	**14**	5	5	0	4	0
Estonia	**7**	**7**	1	1	2	3	0
Finland	**27**	**29**	15	4	4	6	0
France	**511**	**518**	66	238	47	42	125
Germany	**456**	**431**	137	175	31	86	2
Greece	**30**	**28**	13	11	4	0	0
Hungary	**14**	**14**	7	5	1	1	0
Ireland	**7**	**9**	6	3	0	0	0
Italy	**271**	**306**	131	86	61	27	1
Latvia	**6**	**6**	0	4	0	2	0
Lithuania	**16**	**16**	7	3	3	3	0
Malta	**0**	**2**	1	0	1	0	0
Netherlands	**40**	**44**	14	10	0	20	0
Poland	**42**	**91**	5	66	5	15	0
Portugal	**42**	**53**	21	25	3	4	0
Slovakia	**24**	**26**	6	19	1	0	0
Slovenia	**6**	**6**	2	3	0	1	0
Spain	**283**	**287**	118	36	109	24	0
Sweden	**23**	**24**	4	16	0	4	0
United Kingdom	**106**	**111**	23	68	6	14	0
Total EU-25 countries	**2197**	**2304**	**662**	**889**	**305**	**320**	**128**
Non-EU-25 countries							
Bosnia Herzegovina	**1**	**3**	2	1	0	0	0
Bulgaria	**44**	**20**	1	19	0	0	0
FYROM	**3**	**12**	6	1	5	0	0
Iceland	**2**	**2**	1	1	0	0	0
Liechtenstein	**0**	**1**	0	0	0	1	0
Norway	**11**	**12**	5	2	0	5	0
Romania	**25**	**30**	6	15	7	1	1
Serbia and Montenegro	**8**	**22**	6	11	5	0	0
Switzerland	**25**	**29**	10	10	2	7	0
Total non- EU-25 countries	**119**	**131**	**37**	**60**	**19**	**14**	**1**
Total all countries	**2316**	**2435**	**699**	**949**	**324**	**334**	**129**

Table B3 Total number of PM_{10} stations in 2003 and 2004 and the type of PM_{10} stations in 2004

Country	**Total number of stations 2003**	**Total number of stations 2004**	Traffic	Urban back-ground	Industrial	Regional back-ground	Unknown
EU-25 countries							
Austria	**96**	**106**	41	34	13	18	0
Belgium	**33**	**42**	7	25	5	5	0
Cyprus	**2**	**2**	1	0	0	1	0
Czech Republic	**65**	**70**	16	38	1	15	0
Denmark	**8**	**12**	5	5	0	2	0
Estonia	**4**	**4**	1	1	2	0	0
Finland	**33**	**33**	25	6	1	1	0
France	**323**	**350**	38	159	42	17	94
Germany	**416**	**400**	130	168	31	71	0
Greece	**17**	**16**	9	5	2	0	0
Hungary	**8**	**10**	5	4	1	0	0
Ireland	**10**	**14**	8	6	0	0	0
Italy	**141**	**168**	82	51	28	7	0
Latvia	**2**	**3**	2	1	0	0	0
Lithuania	**12**	**12**	7	2	3	0	0
Malta	**0**	**2**	1	0	1	0	0
Netherlands	**33**	**37**	14	7	0	16	0
Poland	**32**	**103**	6	84	6	7	0
Portugal	**34**	**47**	19	21	2	5	0
Slovakia	**26**	**26**	6	19	1	0	0
Slovenia	**7**	**7**	3	3	0	1	0
Spain	**224**	**240**	97	35	87	21	0
Sweden	**25**	**25**	4	18	0	3	0
United Kingdom	**72**	**74**	11	53	6	4	0
Total EU-25 countries	**1623**	**1803**	**538**	**745**	**232**	**194**	**94**
Non-EU-25 countries							
Bulgaria	**14**	**13**	2	11	0	0	0
FYROM	**3**	**13**	6	1	5	1	0
Iceland	**2**	**2**	1	1	0	0	0
Liechtenstein	**0**	**1**	0	0	0	1	0
Norway	**7**	**11**	7	4	0	0	0
Romania	**6**	**16**	2	7	6	0	1
Serbia and Montenegro	**1**	**1**	0	1	0	0	0
Switzerland	**22**	**24**	9	8	1	6	0
Total non- EU-25 countries	**55**	**81**	**27**	**33**	**12**	**8**	**1**
Total all countries	**1678**	**1884**	**565**	**778**	**244**	**202**	**95**

Table B4 Total number of $PM_{2.5}$ stations in 2003 and 2004 and the type of $PM_{2.5}$ stations in 2004

Country	**Total number of stations 2003**	**Total number of stations 2004**	Traffic	Urban back-ground	Industrial	Regional back-ground	Unknown
EU-25 countries							
Austria	1	**3**	0	1	0	2	0
Belgium	10	**12**	2	8	1	1	0
Czech Republic	0	**22**	5	15	1	1	0
Denmark	0	**2**	1	1	0	0	0
Finland	4	**7**	3	1	0	3	0
France	40	**50**	7	25	0	0	18
Germany	10	**15**	4	5	1	5	0
Ireland	0	**2**	0	2	0	0	0
Italy	2	**8**	4	4	0	0	0
Poland	3	**2**	1	1	0	0	0
Portugal	5	**12**	5	3	1	3	0
Slovakia	6	**5**	2	3	0	0	0
Sweden	0	**6**	2	1	0	3	0
United Kingdom	4	**4**	1	1	0	2	0
Total EU-25 countries	**85**	**150**	**37**	**71**	**4**	**20**	**18**
Non-EU-25 countries							
Bosnia Herzegovina	0	**2**	2	0	0	0	0
Iceland	2	**2**	1	1	0	0	0
Norway	4	**6**	4	2	0	0	0
Total non- EU-25 countries	**6**	**10**	**7**	**3**	**0**	**0**	**0**
Total all countries	**91**	**160**	**44**	**74**	**4**	**20**	**18**

Table B5 Total number of Pb stations in 2003 and 2004 and the type of Pb stations in 2004

Country	**Total number of stations 2003**	**Total number of stations 2004**	Traffic	Urban back-ground	Industrial	Regional back-ground	Unknown
EU-25 countries							
Austria	**12**	**15**	6	3	3	3	0
Belgium	**38**	**39**	7	14	11	7	0
Finland	**0**	**1**	1	0	0	0	0
Ireland	**5**	**5**	3	1	1	0	0
Italy	**7**	**7**	6	1	0	0	0
Latvia	**2**	**4**	1	1	0	2	0
Netherlands	**4**	**4**	1	1	0	2	0
Poland	**0**	**23**	4	16	1	2	0
Slovakia	**20**	**21**	4	16	1	0	0
Spain	**48**	**0**	0	0	0	0	0
Total EU-25 countries	**136**	**119**	**33**	**53**	**17**	**16**	**0**
Non-EU-25 countries							
Bulgaria	**16**	**6**	0	6	0	0	0
Romania	**8**	**14**	2	6	5	1	0
Total non- EU-25 countries	**24**	**20**	**2**	**12**	**5**	**1**	**0**
Total all countries	**160**	**139**	**35**	**65**	**22**	**17**	**0**

Table B6 Total number of CO stations in 2003 and 2004 and the type of CO stations in 2004

Country	**Total number of stations 2003**	**Total number of stations 2004**	Traffic	Urban back-ground	Industrial	Regional back-ground	Unknown
EU-25 countries							
Austria	**49**	**46**	25	13	4	4	0
Belgium	**17**	**18**	8	9	1	0	0
Cyprus	**1**	**1**	1	0	0	0	0
Czech Republic	**27**	**30**	12	15	1	2	0
Denmark	**6**	**6**	5	1	0	0	0
Estonia	**5**	**5**	1	1	2	1	0
Finland	**12**	**11**	10	1	0	0	0
France	**115**	**109**	53	26	3	5	22
Germany	**252**	**218**	109	80	20	8	1
Greece	**17**	**15**	9	3	3	0	0
Hungary	**9**	**11**	7	3	1	0	0
Ireland	**3**	**8**	6	2	0	0	0
Italy	**194**	**209**	126	54	25	4	0
Latvia	**1**	**1**	1	0	0	0	0
Lithuania	**7**	**8**	6	1	1	0	0
Malta	**0**	**2**	1	0	1	0	0
Netherlands	**19**	**21**	11	6	0	4	0
Poland	**22**	**27**	5	19	1	2	0
Portugal	**32**	**36**	21	15	0	0	0
Slovakia	**10**	**12**	5	6	1	0	0
Slovenia	**4**	**4**	1	3	0	0	0
Spain	**148**	**146**	93	29	20	4	0
Sweden	**4**	**1**	1	0	0	0	0
United Kingdom	**80**	**81**	19	55	5	2	0
Total EU-25 countries	**1034**	**1026**	**536**	**342**	**89**	**36**	**23**
Non-EU-25 countries							
Bosnia Herzegovina	**1**	**3**	2	1	0	0	0
Bulgaria	**7**	**8**	2	6	0	0	0
FYROM	**3**	**12**	6	1	5	0	0
Iceland	**1**	**1**	1	0	0	0	0
Norway	**2**	**2**	2	0	0	0	0
Romania	**4**	**11**	2	4	4	0	1
Serbia and Montenegro	**1**	**1**	0	1	0	0	0
Switzerland	**10**	**12**	8	2	0	2	0
Total non- EU-25 countries	**29**	**50**	**23**	**15**	**9**	**2**	**1**
Total all countries	**1063**	**1076**	**559**	**357**	**98**	**38**	**24**

Table B7 Total number of C_6H_6 stations in 2003 and 2004 and the type of C_6H_6 stations in 2004

Country	**Total number of stations 2003**	**Total number of stations 2004**	Traffic	Urban back-ground	Industrial	Regional back-ground	Unknown
EU-25 countries							
Austria	**20**	**19**	11	4	1	3	0
Belgium	**6**	**30**	8	12	3	7	0
Czech Republic	**11**	**21**	7	11	1	2	0
Denmark	**1**	**1**	1	0	0	0	0
France	**20**	**25**	10	5	3	1	6
Germany	**81**	**73**	53	14	1	5	0
Greece	**0**	**1**	1	0	0	0	0
Ireland	**2**	**6**	4	2	0	0	0
Italy	**52**	**77**	46	18	13	0	0
Latvia	**0**	**1**	1	0	0	0	0
Lithuania	**5**	**5**	1	1	3	0	0
Malta	**0**	**1**	1	0	0	0	0
Netherlands	**9**	**9**	4	2	0	3	0
Poland	**0**	**11**	4	6	1	0	0
Portugal	**5**	**5**	3	2	0	0	0
Slovakia	**4**	**4**	3	1	0	0	0
Spain	**31**	**31**	18	7	5	1	0
Sweden	**0**	**13**	1	12	0	0	0
United Kingdom	**37**	**40**	10	29	0	1	0
Total EU-25 countries	**284**	**373**	**187**	**126**	**31**	**23**	**6**
Non-EU-25 countries							
Iceland	**1**	**1**	1	0	0	0	0
Norway	**0**	**8**	7	1	0	0	0
Romania	**2**	**1**	0	1	0	0	0
Serbia and Montenegro	**0**	**1**	1	0	0	0	0
Switzerland	**2**	**3**	0	2	0	1	0
Total non- EU-25 countries	**5**	**14**	**9**	**4**	**0**	**1**	**0**
Total all countries	**289**	**387**	**196**	**130**	**31**	**24**	**6**

Table B8 Total number of O_3 stations in 2003 and 2004 and the type of O_3 stations in 2004

Country	**Total number of stations 2003**	**Total number of stations 2004**	Traffic	Urban back-ground	Industrial	Regional back-ground	Unknown
EU-25 countries							
Austria	**115**	**116**	16	39	8	53	0
Belgium	**37**	**37**	4	20	2	11	0
Cyprus	**2**	**2**	1	0	0	1	0
Czech Republic	**41**	**50**	6	24	1	19	0
Denmark	**9**	**11**	2	5	0	4	0
Estonia	**7**	**7**	1	1	2	3	0
Finland	**17**	**18**	2	4	2	10	0
France	**441**	**463**	7	234	18	81	123
Germany	**347**	**321**	43	158	26	94	0
Greece	**26**	**25**	9	11	4	1	0
Hungary	**9**	**7**	0	5	1	1	0
Ireland	**8**	**7**	2	0	0	5	0
Italy	**153**	**165**	41	66	30	28	0
Latvia	**5**	**5**	0	4	0	1	0
Lithuania	**12**	**12**	6	1	2	3	0
Malta	**1**	**3**	1	0	1	1	0
Netherlands	**33**	**36**	8	8	0	20	0
Poland	**21**	**36**	0	21	0	15	0
Portugal	**35**	**44**	11	25	3	5	0
Slovakia	**21**	**20**	0	13	1	6	0
Slovenia	**9**	**10**	3	4	0	3	0
Spain	**295**	**316**	142	61	73	40	0
Sweden	**9**	**14**	1	6	0	7	0
United Kingdom	**85**	**88**	3	63	3	19	0
Total EU-25 countries	**1738**	**1813**	**309**	**773**	**177**	**431**	**123**
Non-EU-25 countries							
Bosnia Herzegovina	**0**						
Bulgaria	**7**	**2**	2	0	0	0	0
FYROM	**3**	**10**	2	7	0	1	0
Iceland	**3**	**11**	5	0	5	1	0
Liechtenstein	**0**	**4**	2	1	0	1	0
Norway	**10**	**1**	0	0	0	1	0
Romania	**9**	**9**	0	1	0	8	0
Serbia and Montenegro	**1**	**13**	2	6	4	0	1
Switzerland	**25**	**1**	0	1	0	0	0
Total non- EU-25 countries	**58**	**79**	**22**	**26**	**11**	**19**	**1**
Total all countries	**1796**	**1892**	**331**	**799**	**188**	**450**	**124**

Table B9 Total number of BS stations in 2003 and 2004 and the type of BS stations in 2004

Country	**Total number of stations 2003**	**Total number of stations 2004**	Traffic	Urban back-ground	Industrial	Regional back-ground	Unknown
EU-25 countries							
Belgium	**23**	**26**	4	18	3	1	0
Germany	**33**	**0**					
Greece	**5**	**5**	3	2	0	0	0
Netherlands	**16**	**14**	3	2	0	9	0
Poland	**6**	**0**					
Spain	**13**	**0**					
Sweden	**6**	**6**	0	4	0	2	0
United Kingdom	**148**	**126**	0	125	1	0	0
Total EU-25 countries	**250**	**177**	**10**	**151**	**4**	**12**	**0**
Non-EU-25 countries							
FYROM	**28**	**27**	9	14	4	0	0
Serbia and Montenegro	**0**	**19**	6	8	5	0	0
Total non- EU-25 countries	**28**	**46**	**15**	**22**	**9**	**0**	**0**
Total all countries	**278**	**223**	**25**	**173**	**13**	**12**	**0**

Annex C Supplementary information on data series and stations in AIRBASE

C1. Information on time series in AIRBASE

Table C1.1 Sulphur dioxide (SO_2)

Country	Number of stations with data	Years with available data	Average length of time series (years) (1)	Percentage of stations with essential information in this period (2)	Average data capture in 2004 (3)
EU-25 countries					
Austria	185	1990-2004	10.4	100	90
Belgium	78	1985-2004	14.6	100	86
Cyprus	1	2003-2004	2.0	100	97
Czech Republic	83	1992-2004	8.3	100	88
Denmark	31	1976-2004	4.6	41	90
Estonia	8	1997-2004	6.0	100	86
Finland	19	1990-2004	7.2	100	95
France	625	1981-2004	4.7	75	85
Germany	625	1976-2004	6.1	99	91
Greece	28	1983-2004	4.8	96	78
Hungary	25	1997-2004	1.9	100	100
Ireland	13	2000-2004	2.0	100	91
Italy	368	1976-2004	2.6	86	84
Latvia	15	1997-2004	3.8	100	94
Lithuania	19	1997-2004	2.2	100	85
Malta	2	2004-2004	1.0	100	36
Netherlands	81	1976-2004	9.3	65	84
Poland	107	1997-2004	2.9	100	72
Portugal	64	1986-2004	3.7	93	92
Slovakia	34	1995-2004	3.7	100	97
Slovenia	8	1997-2004	4.9	100	89
Spain	404	1986-2004	4.5	100	84
Sweden	18	1993-2004	6.2	100	72
United Kingdom	97	1985-2004	7.7	100	88
Non-EU-25 countries					
Bosnia Herzegovina	3	2002-2005 *	1.7	100	91
Bulgaria	52	1998-2004	5.7	100	50
FYROM	39	1997-2004	5.4	100	62
Iceland	3	1993-2004	4.7	100	94
Norway	8	1998-2004	6.9	100	97
Romania	43	2001-2004	2.7	97	91
Serbia and Montenegro	23	2002-2004	1.3	100	92
Switzerland	34	1992-2004	8.7	100	98

*) Data delivered until March 2005

(1) The calculation of the length of time series is based on hourly and daily measurement values.
(2) Essential information: station name, station coordinates and altitude, type of station and type of area.
(3) Averaged over the stations.

Table C1.2 Nitrogen dioxide (NO_2)

Country	Number of stations with data	Years with available data	Average length of time series	Percentage of stations with essential information in this period	Average data capture in 2004
EU-25 countries					
Austria	190	1990-2004	10.1	100	92
Belgium	60	1990-2004	8.4	100	89
Cyprus	1	2003-2004	2.0	100	97
Czech Republic	85	1992-2004	8.2	100	86
Denmark	23	1982-2004	5.4	69	80
Estonia	8	1997-2004	5.6	100	86
Finland	35	1990-2004	5.3	100	93
France	625	1982-2004	4.6	73	89
Germany	674	1984-2004	6.2	99	92
Greece	32	1983-2004	6.0	96	80
Hungary	25	1997-2004	2.0	100	100
Ireland	14	1999-2004	2.4	100	100
Italy	438	1999-2004	2.6	98	86
Latvia	15	1997-2004	3.7	100	97
Lithuania	19	1997-2004	2.2	100	85
Malta	2	2004-2004	1.0	100	32
Netherlands	69	1981-2004	9.0	85	85
Poland	120	1997-2004	2.9	100	76
Portugal	74	1986-2004	3.6	95	91
Slovakia	34	1995-2004	6.0	100	96
Slovenia	6	1997-2004	4.7	100	87
Spain	365	1987-2004	4.6	100	84
Sweden	33	1993-2004	5.8	100	77
United Kingdom	129	1980-2004	7.5	100	88
Non-EU-25 countries					
Bosnia Herzegovina	3	2002-2005 *	1.7	100	88
Bulgaria	49	1998-2004	5.8	100	46
FYROM	12	2003-2004	1.3	100	28
Iceland	2	1994-2004	7.0	100	97
Liechtenstein	1	2004-2004	1.0	100	99
Norway	17	1994-2004	4.6	100	94
Romania	34	2001-2004	2.6	97	91
Serbia and Montenegro	22	2002-2004	1.4	100	94
Switzerland	35	1992-2004	11.3	100	98

*) Data delivered until March 2005

Table C1.3 Particulate matter (<10 µm)

Country	Number of stations with data	Years with available data	Average length of time series	Percentage of stations with essential information in this period	Average data capture in 2004
EU-25 countries					
Austria	112	2000-2004	3.0	100	95
Belgium	45	1994-2004	5.7	100	94
Cyprus	2	2003-2004	2.0	100	98
Czech Republic	82	1996-2004	6.3	100	86
Denmark	12	2001-2004	2.7	100	78
Estonia	4	2001-2004	3.7	100	78
Finland	38	1991-2004	4.1	100	95
France	371	2001-2004	3.2	73	87
Germany	489	1998-2004	3.8	100	88
Greece	17	2001-2004	3.6	100	62
Hungary	10	2000-2004	2.1	100	100
Ireland	15	1999-2004	3.3	100	100
Italy	207	1999-2004	1.9	99	80
Latvia	4	2001-2004	1.7	100	74
Lithuania	13	1999-2004	1.9	100	93
Malta	2	2004-2004	1.0	100	37
Netherlands	39	1997-2004	4.8	100	81
Poland	122	1997-2004	2.2	100	77
Portugal	50	1997-2004	2.7	100	85
Slovakia	26	1999-2004	2.9	100	96
Slovenia	7	2001-2004	3.4	100	91
Spain	292	1997-2004	3.5	100	80
Sweden	31	1998-2004	2.9	100	70
United Kingdom	80	1992-2004	7.2	100	88
Non-EU-25 countries					
Bulgaria	23	1998-2004	3.2	100	72
FYROM	13	2003-2004	1.2	100	51
Iceland	5	1994-2004	4.6	100	90
Liechtenstein	1	2004-2004	1.0	100	97
Norway	16	1994-2004	3.7	100	86
Romania	18	2003-2004	1.2	94	84
Serbia and Montenegro	1	2003-2004	2.0	100	85
Switzerland	26	1992-2004	6.3	100	98

Table C1.4 Particulate matter (<2.5 µm)

Country	Number of stations with data	Years with available data	Average length of time series	Percentage of stations with essential information in this period	Average data capture in 2004
EU-25 countries					
Austria	3	2001-2004	2.0	100	64
Belgium	13	2000-2004	2.3	100	87
Czech Republic	22	2004-2004	1.0	100	86
Denmark	2	2004-2004	1.0	100	92
Finland	8	2001-2004	2.0	100	91
France	54	2001-2004	2.5	62	73
Germany	16	2003-2004	1.6	100	74
Ireland	2	2004-2004	1.0	100	100
Italy	8	2003-2004	1.3	100	68
Poland	5	2001-2004	2.2	100	65
Portugal	13	2002-2004	1.5	100	58
Slovakia	6	2003-2004	1.8	100	93
Sweden	6	2002-2004	2.0	100	72
United Kingdom	4	1998-2004	6.3	100	96
Non-EU-25 countries					
Bosnia Herzegovina	2	2004-2005 *	1.0	100	89
Iceland	3	1995-2004	4.3	100	95
Norway	6	2003-2004	1.7	100	84

Table C1.5 Lead

Country	Number of stations with data	Years with available data	Average length of time series	Percentage of stations with essential information in this period	Average data capture in 2004
EU-25 countries					
Austria	19	1999-2004	3.3	100	100
Belgium	72	1990-2004	8.2	100	83
Denmark	23	1982-2001	2.1	47	0
Finland	2	1993-2004	2.0	100	100
Germany	17	1988-1989	2.0	100	0
Ireland	7	1982-2004	2.4	85	99
Italy	7	2003-2004	2.0	100	18
Latvia	5	2002-2005	1.6	100	80
Netherlands	4	2001-2004	4.0	100	48
Poland	23	2004-2004	1.0	100	39
Portugal	1	2002-2002	1.0	100	0
Slovakia	21	2003-2004	2.0	100	22
Spain	81	1993-2003	2.3	100	0
Non-EU-25 countries					
Bulgaria	26	1998-2004	5.2	100	48
Romania	17	2001-2004	2.2	100	78

Table C1.6 Carbon monoxide (CO)

Country	Number of stations with data	Years with available data	Average length of time series	Percentage of stations with essential information in this period	Average data capture in 2004
EU-25 countries					
Austria	83	1990-2004	7.8	100	92
Belgium	19	1994-2004	5.5	100	92
Cyprus	1	2003-2004	2.0	100	97
Czech Republic	40	1992-2004	7.6	100	88
Denmark	6	1998-2004	6.0	100	96
Estonia	5	1997-2004	4.6	100	80
Finland	14	1990-2004	5.3	100	92
France	144	1982-2004	4.4	75	85
Germany	407	1985-2004	4.5	99	93
Greece	19	1983-2004	6.1	94	80
Hungary	19	1997-2004	1.7	100	100
Ireland	10	1999-2004	1.7	100	100
Italy	293	1999-2004	2.7	99	86
Latvia	1	2003-2004	2.0	100	96
Lithuania	11	1997-2004	2.0	100	95
Malta	2	2004-2004	1.0	100	23
Netherlands	47	1981-2004	7.7	80	85
Poland	41	1997-2004	3.2	100	83
Portugal	46	1997-2004	3.9	100	92
Slovakia	12	1995-2004	5.5	100	90
Slovenia	4	2002-2004	3.0	100	91
Spain	191	1987-2004	5.2	100	89
Sweden	4	1998-2004	5.0	100	98
United Kingdom	95	1982-2004	7.4	100	90
Non-EU-25 countries					
Bosnia Herzegovina	3	2002-2005 *)	1.7	100	90
Bulgaria	13	1998-2004	4.9	100	89
FYROM	12	2003-2004	1.3	100	47
Iceland	1	1994-2004	11.0	100	99
Norway	2	2003-2004	2.0	100	88
Romania	12	2003-2004	1.3	91	90
Serbia and Montenegro	1	2003-2004	2.0	100	96
Switzerland	20	1992-2004	9.3	100	96

*) Data delivered until March 2005

Table C1.7 Benzene (C_6H_6)

Country	Number of stations with data	Years with available data	Average length of time series	Percentage of stations with essential information in this period	Average data capture in 2004
EU-25 countries					
Austria	22	1999-2004	3.7	100	100
Belgium	41	1994-2004	4.6	100	53
Czech Republic	21	2002-2004	1.7	100	61
Denmark	1	2002-2004	3.0	100	76
France	29	2002-2004	2.0	79	60
Germany	108	1999-2004	3.6	100	85
Greece	1	2004-2004	1.0	100	71
Ireland	6	2002-2004	1.5	100	97
Italy	86	1999-2004	2.2	100	76
Latvia	1	2004-2004	1.0	100	66
Lithuania	5	2003-2004	2.0	100	85
Malta	1	2004-2004	1.0	100	51
Netherlands	9	1997-2004	5.2	100	44
Poland	11	2004-2004	1.0	100	71
Portugal	5	2003-2004	2.0	100	71
Slovakia	4	2003-2004	2.0	100	94
Spain	42	2002-2004	1.9	100	74
Sweden	13	2004-2005	1.0	100	51
United Kingdom	48	1993-2004	3.9	100	88
Non-EU-25 countries					
Iceland	1	2002-2004	3.0	100	77
Norway	8	2004-2004	1.0	100	94
Romania	2	2003-2004	1.5	100	62
Serbia and Montenegro	1	2004-2004	1.0	100	30
Switzerland	6	1994-2004	2.7	100	72

Table C1.8 Ozone (O_3)

Country	Number of stations with data	Years with available data	Average length of time series	Percentage of stations with essential information in this period	Average data capture in 2004
EU-25 countries					
Austria	135	1990-2004	10.8	100	92
Belgium	41	1990-2004	8.6	100	90
Cyprus	2	2003-2004	2.0	100	92
Czech Republic	56	1992-2004	6.8	100	90
Denmark	12	1997-2004	5.0	100	74
Estonia	7	1997-2004	6.4	100	86
Finland	21	1990-2004	7.2	100	95
France	537	1982-2004	4.5	73	89
Germany	498	1984-2004	6.6	99	93
Greece	28	1983-2004	5.9	96	85
Hungary	15	1997-2004	2.0	100	100
Ireland	11	1999-2004	3.6	100	96
Italy	233	1999-2004	2.9	99	88
Latvia	14	1997-2004	3.2	100	78
Lithuania	14	1997-2004	3.3	100	85
Malta	3	2002-2004	1.7	100	64
Netherlands	55	1981-2004	9.0	89	90
Poland	47	1997-2004	3.8	100	82
Portugal	55	1986-2004	3.6	98	94
Slovakia	26	1997-2004	5.8	100	91
Slovenia	10	1997-2004	4.8	100	94
Spain	365	1987-2004	4.5	100	88
Sweden	18	1998-2004	3.3	100	88
United Kingdom	100	1982-2004	8.9	100	90
Non-EU-25 countries					
Bosnia Herzegovina	2	2004-2005 *)	1.0	100	88
Bulgaria	13	1998-2004	4.5	100	88
FYROM	11	2003-2004	1.3	100	54
Iceland	4	1994-2004	4.7	100	79
Liechtenstein	1	2004-2004	1.0	100	98
Norway	11	1998-2004	6.3	100	99
Romania	17	2002-2004	1.4	94	85
Serbia and Montenegro	1	2003-2004	2.0	100	87
Switzerland	37	1992-2004	10.8	100	97

*) Data delivered until March 2005

Table C1.9 Black smoke

Country	Number of stations with data	Years with available data	Average length of time series	Percentage of stations with essential information in this period	Average data capture in 2004
EU-25 countries					
Belgium	58	1990-2004	6.1	100	92
Denmark	6	1976-1982	6.5	0	0
France	59	1968-1990	5.5	6	0
Germany	33	2003-2003	1.0	100	0
Greece	7	1984-2004	6.1	85	3
Ireland	46	1973-2000	4.6	86	0
Luxembourg	5	1976-1993	14.0	0	0
Netherlands	18	1990-2004	9.5	100	91
Poland	8	1997-2003	6.3	100	0
Portugal	6	1986-1991	3.5	33	0
Spain	48	1986-2003	2.9	100	0
Sweden	15	1997-2004	4.9	100	53
United Kingdom	264	1969-2004	6.2	100	77
Non-EU-25 countries					
FYROM	29	1997-2004	7.5	100	81
Serbia and Montenegro	19	2002-2004	1.3	100	96

C2. Stations with and without data and stations with missing essential information in AIRBASE

Table C2.1. Number of stations in AirBase with raw data, with only statistics, with data, without data and total number of stations.

Country	Number of stations with raw data	Number of stations with only statistics	Number of stations with data	Number of stations without data	Total number of stations
EU-25 countries					
Austria	227		227	1	228
Belgium	262		262	3	265
Cyprus	2		2		2
Czech Republic	87		87		87
Denmark	39	1	40		40
Estonia	8		8		8
Finland	71		71		71
France	984		984		984
Germany	749		749	320	1069
Greece	34		34		34
Hungary	25		25		25
Ireland	71	8	79	1	80
Italy	544	192	736		736
Latvia	18		18		18
Lithuania	20		20		20
Luxembourg	5		5		5
Malta	3		3		3
Netherlands	102		102		102
Poland	177		177	5	182
Portugal	85		85		85
Slovakia	44		44	2	46
Slovenia	10		10	1	11
Spain	530		530		530
Sweden	49		49		49
United Kingdom	482	45	527	104	631
Total EU-25 countries	4628	246	4874	437	5311
Non-EU-25 countries					
Bosnia Herzegovina	3	29	32		32
Bulgaria	52		52	1	53
FYROM [4)]	42		42		42
Iceland	8		8		8
Liechtenstein	1		1		1
Norway	31		31		31
Romania	43	4	47		47
Serbia and Montenegro	23		23		23
Switzerland	37		37		37
Total non-EU-25 countries	240	33	273	1	274
Total all countries	4868	279	5147	438	5585

Table C2.2. Total Number of stations in AirBase with missing essential meta information.

Country	Total number of stations	Number of stations with latitude = 0 *)	Number of stations with longitude = 0 *)	Number of stations with altitude undefined *)	Number of stations with type of station undefined *)	Number of stations with type of area undefined *)
EU-25 countries						
Austria	228					
Belgium	265					
Cyprus	2					
Czech Republic	87					
Denmark	40	6	6		18	
Estonia	8			1		
Finland	71					
France	984	31	36		277	43
Germany	1069				3	2
Greece	34				2	
Hungary	25					
Ireland	80	2	2		5	
Italy	736	35	35	113	34	41
Latvia	18					
Lithuania	20					
Luxembourg	5				5	
Malta	3					
Netherlands	102	2	2		30	7
Poland	182					
Portugal	85				6	1
Slovakia	46					
Slovenia	11					
Spain	530					
Sweden	49					
United Kingdom	631					6 *
Total EU-25 countries	5311	76	81	114	380	100
Non-EU-25 countries						
Bosnia Herzegovina	32				11	4
Bulgaria	53			2		
FYROM [4)]	42					
Iceland	8					
Liechtenstein	1					
Norway	31					
Romania	47					1
Serbia and Montenegro	23					
Switzerland	37					
Total non-EU-25 countries	274	0	0	2	11	5
Total all countries	5585	76	81	116	391	105

* all stations with missing essential meta information are stations with measurement data except 2 stations of United Kingdom; these 2 stations have no measurement data and have undefined type of area.

Annex D. NO2/NOx/NO, 4th Daughter Directive and non-directive components

Stations which have delivered only statistics are not included.

Table D1 Countries which have delivered measurement data of NO2, NOx and/or NO, 2004

	NO2	NOx	NO
EU-25 countries			
Austria	151	0	151
Belgium	56	0	56
Cyprus	1	1	0
Czech Republic	74	74	0
Denmark	14	0	14
Estonia	7	7	0
Finland	29	27	1
France	518	0	514
Germany	431	0	431
Greece	28	26	28
Hungary	14	13	0
Ireland	9	9	0
Italy	306	182	207
Latvia	6	0	0
Lithuania	16	8	0
Malta	2	0	2
Netherlands	44	44	44
Poland	91	40	0
Portugal	53	43	46
Slovakia	26	0	0
Slovenia	6	6	0
Spain	287	0	283
Sweden	24	1	0
United Kingdom	111	111	0
Non-EU-25 countries			
Bosnia Herzegovina	3	1	1
Bulgaria	20		7
Fyrom	12	12	12
Iceland	2		2
Liechtenstein	1		1
Norway	12	2	5
Romania	30	8	12
Serbia and Montenegro	22	3	3
Switzerland	29	25	23

Table D2 Countries which have delivered measurement data of 4DD components, 2004

	Formula	Component	Number of stations
EU-25 countries			
Austria	As	Arsenic	4
	Cd	Cadmium	10
	Ni	Nickel	4

Belgium	As	Arsenic	24
	Cd	Cadmium	36
	Hg	Mercury	1
	Ni	Nickel	30
Netherlands	As	Arsenic	4
	Cd	Cadmium	4
	Ni	Nickel	4
Slovakia	As	Arsenic	21
	Cd	Cadmium	21
	Ni	Nickel	20
Non-EU-25 countries			
Bulgaria	Cd	Cadmium	3
Romania	Cd	Cadmium	6

Table D3 Ccountries which have delivered measurement data of VOC, 2004

	Formula	Component	Number of stations
EU-25 countries			
Denmark	C_6H_5-CH_3	Toluene	1
Germany	C_6H_5-CH_3	Toluene	66
Ireland	C_6H_5-CH_3	Toluene	3
Italy	C_6H_5-CH_3	Toluene	41
Malta	C_6H_5-CH_3	Toluene	1
	m,p-$C_6H_4(CH_3)_2$	m,p-Xylene	1
Netherlands	C_2H_6	Ethane	1
	Ethene	ethene	1
	HC=CH	Ethyne (Acetylene)	1
	H_3C-CH^{2-}-CH_3	Propane	1
	CH_2=CH-CH_3	Propene	1
	H_3C-CH^{2-}-CH^{2-}-CH_3	n-Butane	1
	H_2C=CH-CH^{2-}-CH_3	1-Butene	1
	H_3C-CH=CH-CH_3	trans-2-Butene	1
	H_3C-CH=CH-CH_3	cis-2-Butene	1
	H_3C-$(CH_2)_3$-CH_3	n-Pentane	1
	C_6H_{14}	n-Hexane	9
	C_7H_{16}	n-Heptane	9
	C_8H_{18}	n-Octane	9
	C_6H_5-CH_3	Toluene	9
	C_6H_5-C_2H_5	Ethyl benzene	9
	m,p-$C_6H_4(CH_3)_2$	m,p-Xylene	9
	o-C_6H_4-$(CH_3)_2$	o-Xylene	9
	$C_6H^{3-}(CH_3)_3$	1,2,4-Trimethylbenzene	9
	$C_6H_3(CH_3)_3$	1,2,3-Trimethylbenzene	9
	$C_6H_3(CH_3)_3$	1,3,5-Trimethylbenzene	9
Poland	C_6H_5-CH_3	Toluene	1
	m,p-$C_6H_4(CH_3)_2$	m,p-Xylene	1
	o-C_6H_4-$(CH_3)_2$	o-Xylene	1
United Kingdom	CH_2=CH-CH=CH_2	1.3 Butadiene	5
Non-EU-25 countries			
Iceland	C_6H_5-CH_3	Toluene	1
Romania	HCHO	Formaldehyde	3
Switzerland	C_6H_5-CH_3	Toluene	3

Table D4 Countries which have delivered measurement data of other components, 2004

	Formula	Component	Number of stations
EU-25 countries			
Austria	SPM	Total suspended particulates	30
	PM1	Particulate matter < 1 ⁄m	1
Denmark	SPM	Total suspended particulates	1
Estonia	SPM	Total suspended particulates	1
Finland	SPM	Total suspended particulates	11
Germany	SPM	Total suspended particulates	12
Italy	SPM	Total suspended particulates	57
	THC (NM)	Total non-methane hydrocarbons	9
	H2S	Hydrogen sulphide	9
Lithuania	$HNO_3^+NO_3$	Total nitrate	1
	$NH^{3+}NH_4$	Total ammonium	1
	SO2 + SO4--	sum_sulph_diox_sulphate	1
Netherlands	CH_4	Methane	1
	C6H5-CH=CH2	Styrene	9
	CHCl=CCl2	Trichloroethylene	9
	C2Cl4	Tetrachloroethylene	9
	NH_3	Ammonia	8
	Ca++	calcium	4
	Cd	Cadmium (deposition)	1
	Cl-	chloride	7
	Cu	Copper	1
	Cyclo-hexane	cyclohexane	1
	Fe	iron	1
	H+	acidity	1
	k	conductivity	1
	K+	potassium	1
	Mg++	magnesium	1
	Na+	sodium	1
	N-DEP	Wet nitrogen deposition	15
	NH4	Particulate ammonium	7
	NH4+	ammonium	1
	NO3-	nitrate	1
	NO3	Particulate nitrate	7
	Pb	Lead (deposition)	1
	pH	pH	1
	precip_amount	precipitation_amount	1
	precip_amount_off	precipitation_amount_off	1
	S-DEP	Wet sulphur deposition	15
	SO4--	sulphate	1
	SO_4 (H_2SO_4 aerosols) (SO_4^--)	Particulate sulphate	7
	Zn	Zinc (deposition)	5
Spain	SPM	Total suspended particulates	58
	CH4	Methane	14
United Kingdom	SA	Strong acidity	126

Non-EU-25 countries			
Bulgaria	SPM	Total suspended particulates	12
	THC (NM)	Total non-methane hydrocarbons	2
	H2S	Hydrogen sulphide	16
	NH_3	Ammonia	5
	T-VOC	Total volatile organic compounds	2
Iceland	CH_4	Methane	1
Norway	SO_4 (H_2SO_4 aerosols) (SO_4^--)	Particulate sulphate	6
	$NH^{3+}NH_4$	Total ammonium	6
	$HNO_3^+NO_3$	Total nitrate	6
Romania	SPM	Total suspended particulates	13
	NH_3	Ammonia	16
	SO_4 (H_2SO_4 aerosols) (SO_4^--)	Particulate sulphate	3
Switzerland	THC (NM)	Total non-methane hydrocarbons	5

Annex E Status overview of the EoI 2005 EoI Reporting

ETC/ACC provide a regurly updated progress report for the annual EoI data cycle on:
http://air-climate.eionet.europa.eu/country_tools/aq/eoi_to_airbase_status.html

Overview 2005 EoI Reporting (Air Quality data of 2004)

Status since: 17-3-2006

Country (#)		Date EoI data arrived at ETC/ACC	Initial upload to AirBase for QA/QC checking	Date QA/QC report sent to country	Date country reply to QA/QC report	End date processing data and statistics into AirBase	Remark
Alpha-2	Short name					(***)	
AL	Albania						
AT	Austria *	15-09-05	20-09-05	03-10-05	05-10-05	23-12-05	
BA	Bosnia-Herzegovina	23-09-05	03-10-05	07-10-05	14-10-05	23-12-05	
BE	Belgium *	21-09-05	29-09-05	07-10-05	03-11-05	23-12-05	
BG	Bulgaria **	21-09-05	30-09-05	07-10-05	10-10-05	23-12-05	
CH	Switzerland	13-10-05	01-11-05	03-11-05	07-11-05	23-12-05	
CS	Serbia & Montenegro	30-09-05	28-10-05	03-11-05	17-03-06	10-01-06	
CY	Cyprus *	27-09-05	11-10-05	26-10-05		23-12-05	No reply expected
CZ	Czech Republic *	29-09-05	22-10-05	03-11-05	08-12-05	23-12-05	
DE	Germany *	29-09-05	11-12-05	02-12-05	13-12-05	23-12-05	
DK	Denmark *	30-09-05	29-10-05	03-11-05		10-01-06	
EE	Estonia *	27-09-05	11-10-05	26-10-05		23-12-05	No reply expected
ES	Spain *	05-10-05	08-12-05	06-12-05	04-01-06	13-01-06	
FI	Finland *	02-12-05	08-12-05	07-12-05		23-12-05	No reply expected
FR	France *	18-07-05	06-12-05	02-12-05	16-01-06	17-01-06	
GB	United Kingdom *	28-09-05	13-10-05	26-10-05	09-11-05	23-12-05	
GR	Greece *	09-09-05	09-09-05	03-10-05	24-10-05	23-12-05	
HR	Croatia						
HU	Hungary *	28-09-05	22-10-05	03-11-05	02-12-05	23-12-05	
IE	Ireland *	14-09-05	16-09-05	03-10-05	22-12-05	10-01-06	
IS	Iceland **	07-10-05	01-11-05	03-11-05	22-12-05	10-01-06	
IT	Italy *	26-09-05	05-10-05	02-12-05	10-01-06	13-01-06	
LI	Liechtenstein **	28-09-05	07-10-05	26-10-05	26-10-05	23-12-05	
LT	Lithuania *	29-09-05	27-10-05	03-11-05	11-11-05	23-12-05	
LU	Luxembourg *						
LV	Latvia *	15-09-05	20-09-05	03-10-05		23-12-05	No reply expected
MK	FYR of Macedonia **	30-09-05	29-10-05	03-11-05	28-11-05	23-12-05	
MT	Malta *	04-10-05	31-10-05	03-11-05	23-11-05	23-12-05	
NL	Netherlands *	29-08-05	07-09-05	03-10-05	30-11-05	23-12-05	
NO	Norway **	06-10-05	01-11-05	03-11-05	25-11-05	23-12-05	
PL	Poland *	29-09-05	25-10-05	03-11-05	30-11-05	23-12-05	
PT	Portugal *	28-09-05	21-10-05	26-10-05	12-12-05	23-12-05	
RO	Romania **	05-01-06	30-01-06	30-01-06			
SE	Sweden *	29-09-05	26-10-05	03-11-05	01-12-05	23-12-05	
SI	Slovenia *	30-09-05	30-10-05	03-11-05		23-12-05	No reply expected
SK	Slovakia *	29-09-05	26-10-05	03-11-05	03-11-05	23-12-05	
TR	Turkey **						

*	EU 25 country
**	Non EU25 country, EEA 31 country
(***)	Data not yet available via website (AirView)
(#)	ISO3166-1 codes: Alpha-2 element and Short Name

Annex F. QA/QC feedback actions

Overview of the QA/QC activities undertaken by the data suppliers and ETC/ACC during the EoI2005 reporting cycle are given in Table F2; other QA/QC feedback actions are described in Table F1 and Table F3. All QA/QC checks are described "QA/QC checks on air quality data in AirBase and on the EoI2004 data – Procedures and results" (see Mol *et al*, 2005b).

Table F1. QA/QC follow up on data supplied in earlier EoI cycles in 2005

Date	Processes by data supplier	Processes by ETC/ACC
1 Apr		Feedback reports on phantom stations PM10 correction factors Erronous station coordinates (incl. reminder missing essential meta data)
1 Apr – 1 June	reply with spreadsheets	
1 June – 1 Oct	reply in the DEM	
1 Oct – 15 Jan		Processing of the (non) replies

Table F2. QA/QC actions on EoI2005 data in 2005 and 2006

Date	Processes by data supplier	Processes by ETC/ACC
1 July		Release of the DEMv8
	Modifying meta data in the DEM Checking meta data in the DEM Import raw data into the DEM Checking raw data in the DEM Submit to Central Data Repository (CDR)	Help desk
1 Oct to 15 Jan		Upload DEM into AIRBASE Checks on outliers, missing essential meta data, resubmission old data, deletion stations/meas. conf with data Send feedback reports to the data suppliers
	Replies on the feedback reports add response rate(s)	
		Processing of the (non) replies
1 Dec		Calculation of statistics and exceedances
Mid Dec		Interim release of AIRBASE with EoI data (see airbase history page)
15 Jan		Calculation of statistics and exceedances
24 Jan		Release of AIRBASE with EoI2005 data (see airbase history page)
		Generating XML download files
14 Febr		Update AIRBASE with corrected EoI2005 data (see airbase history page)
11 April		Update AIRBASE with corrected EoI2005 data (see airbase history page)

Table F3. QA/QC follow up on data supplied in earlier EoI cycles in 2006

Date	Processes by data supplier	Processes by ETC/ACC
1 Febr 1 March		Feedback reports on negative outliers in 1998 and 1999
	Replies on feedback reports	
1 March – 11 April		Processing of the (non) replies

33 countries have delivered EoI2005 data (see the status table in Annex E).
The response on the feedback reports was very good.

Results of the feedback actions are available at Circa:

http://eea.eionet.europa.eu/Members/irc/eionet-circle/airclimate/library?l=/qaqc_country_feedback/eoi_2005_2004_data&vm=detailed&sb=Title

This information is not public. For access to this information a CIRCA user account and password is needed.

In 2005 ETC/ACC have been focussed on erroneous station coordinates. EEA had produced GIS reports on the station locations. These GIS reports can be found on Circa:

http://eea.eionet.europa.eu/Members/irc/eionet-circle/airclimate/library?l=/workshops/technical_workshop/information_airbase&vm=detailed&sb=Title

On base of these reports and other information from AIRBASE ETC/ACC had sent out feedback reports to the data suppliers. These reports and answers can be found on Circa:

http://eea.eionet.europa.eu/Members/irc/eionet-circle/airclimate/library?l=/coordinates_feedback&vm=detailed&sb=Title

Table F4. Status overview of QA/QC feedback actions on the EoI-2005 reporting cycle

Country		outliers		missing essential meta inform.	resub-mitted data	deletion stations/ meas. conf. with data	reply received
		extreme	suspi-cious				
AL	Albania						
AT	Austria						
BA	Bosnia-Herzegovina						
BE	Belgium						
BG	Bulgaria						
CH	Switzerland						
CS	Serbia and Montenegro						
CY	Cyprus						
CZ	Czech Republic						
DE	Germany						
DK	Denmark						
EE	Estonia						
ES	Spain						
FI	Finland						
FR	France						
GB	United Kingdom						
GR	Greece						
HR	Croatia						
HU	Hungary						
IE	Ireland						
IS	Iceland						
IT	Italy						
LI	Liechtenstein						
LT	Lithuania						
LU	Luxembourg						
LV	Latvia						
MK	FYR of Macedonia						
MT	Malta						
NL	Netherlands						
NO	Norway						
PL	Poland						
PT	Portugal						
RO	Romania						
SE	Sweden						
SI	Slovenia						
SK	Slovakia						
TR	Turkey						

Outliers **(green,yellow/red) For definition see Mol *et al*, 2005b.**
Green: Outside ETC/ACC outlier limit values, but seems to be ok
Yellow: Outside ETC/ACC outlier limit values and looks strange
Red: Outside ETC/ACC outlier limit values and looks suspicious

	unknown status outliers (outliers reported, but no reply; green outliers are demarked in AIRBASE, so they are supposed to be correct; the yellow and red outliers remain marked in AIRBASE as incorrect, so they are not visible in AIRBASE
	one or more real outliers detected; reply from MS; corrected data are delivered or the data are marked as incorrect in AIRBASE. (not visible in AIRBASE)
	The detected data are no outliers. The data remain unchanged in AIRBASE.

Missing essential meta information

	detected in feedback report, no reply received
	missing information submitted and loaded in AIRBASE
	missing Information partly submitted and loaded in AIRBASE

Resubmubmitted data

	detectected in feedback report, no reply received. The resubmitted data remain unchanged in AIRBASE.
	The resubmission has been removed and the old overwritten data has been restored in AIRBASE.
	Confirm that the resubmission was intended, so the resubmitted data remain unchanged in AIRBASE.

Deletion of stations or measurement configurations with data:

	detected in feedback report, no reply received; the meta information has kept in AirBase
	The MS wants to keep this meta information in AirBase
	Confirmation to delete. The stations or meas. conf. are removed from AirBase

Reply received on the country feedback report

	expected reply NOT received
	expected reply received
	no reply expected