
Best practices for Short term action plans



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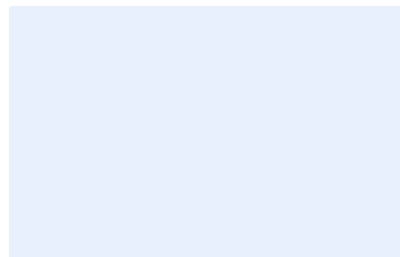
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Executive summary

Following the adoption of a legislative proposal in 2005, Directive 2008/50/EC on ambient air quality and cleaner air for Europe was adopted in 2008. The Directive strengthens the prevention of health risks due to air pollutants by further elaborating Member States' obligations to set up, publish and monitor short term action plans where and when there is a risk of exceedance of relevant environmental objectives. The Commission, in return, is obliged to support Member States in this process by means of publishing best practice examples focussing on the protection of sensitive population groups. Such publication is to guide Member States' efforts in identifying and implementing the most effective and efficient pollutant abatement measures.

The implementation of the Directive will be reviewed in 2013 pursuant to article 32 of the Directive. Article 24, which specifies the obligations of Member States and the Commission with respect to short-term action plans, will be reviewed as part of this process.

This report provides information on the current implementation of short term action plans under the terms of Dir. 2008/50/EC and identifies current best practice for the implementation of these plans.

The report provides an analysis of monitoring data for sites throughout the European Union for the years 2005-2009 contained within Airbase for nitrogen dioxide and sulphur dioxide and in Form 13b of the questionnaires according to Decision 2004/461/EC for ozone. The aim of the analysis was to identify those sites that were "at risk" of exceeding the alert thresholds specified in the Directive over a representative area. The analysis indicated that there were sites "at risk" of exceeding the alert thresholds over representative areas in:

- Spain, Romania and Slovakia for nitrogen dioxide
- Bulgaria, France, Romania, Spain and Slovenia for sulphur dioxide
- Greece, France, Italy, Portugal and possibly Spain for ozone.

We note that, in many cases, there are often extenuating circumstances such that Member States may consider that they are not obliged to prepare a short-term action plan. For example, in Romania and Bulgaria emissions of pollutants have been substantially reduced since accession in 2007 and emissions are expected continue to decrease in the future.

Article 24 of the Directive also allows Member States to draw up short-term action plans where there is a risk of exceeding one or more of the limit values or target values specified in Annexes VII, XI and XIV of the Directive. Here, short-term actions may be considered to be just one of the measures they apply to meet the limit values or target values. Many Member States have submitted notifications under Article 22 of the Directive to extend the time period available for meeting the limit values. We have reviewed the time extension notifications for particulate matter, PM₁₀ prepared by Member States to identify where they have included short-term measures (measures to be implemented if there is a risk of elevated pollutant levels) in their notifications. Our analysis indicated that 8 countries had included short-term measures in their notifications. The measures included measures to reduce vehicle speeds, driving bans for specific classes of vehicle, to limit domestic or commercial heating emissions and to clean streets.

Prior to this project, there was no central inventory of short-term action plans. We therefore sent a questionnaire to all Member States in order to help us identify where they had developed short-term action plans and to provide further information relating to their plans. We obtained 38 questionnaire responses from 14 Member States. The responses provided us with copies of, or links to, 39 short-term action plans. We carried out a preliminary analysis of the content of these short-term action plans. In particular, we considered whether the action plans provided clear details of the legal basis, rationale, implementation

procedures and provision for review. In general, the legal basis is clearly linked to the short-term action plans. However few of the action plans:

- evaluate the risk that short-term information/recommendation or alert threshold values or limit values will be exceeded
- demonstrate that the action plan addresses the most appropriate sources of emission
- show that the measures in the action plan will be effective in reducing pollutant concentrations.

Most of the short-term action plans provide detailed information for implementation. They clearly specify who is responsible for initiating the actions, for delegating actions to others and for terminating the actions; what actions will be taken to reduce emissions or to provide information and recommendations; when will the actions be initiated or terminated; and where will the measures be applied. Some of the French short-term action plans provide the clearest and most comprehensive details of the implementation process and we have used these to provide examples of good practice.

Further analysis of the short-term action plans and the questionnaire responses provided information relating to:

- the role of measurement and forecasting
- additional threshold levels used to initiate short-term measures
- the protection of sensitive population groups
- the evaluation of the effects of short-term measures
- the frequency of implementation of short-term action plans

Many of the Member States use computer models and statistical techniques to forecast pollutant concentrations typically up to three days in advance. These forecasts can then be used in conjunction with the available measurements to provide a better assessment of the risk and potential extent of pollution episodes. Regular comparison between measured and forecast concentrations helps build confidence in the forecasts.

The short-term action plans all refer to relevant information and alert levels specified in the Directive (i.e. for ozone, sulphur dioxide and nitrogen dioxide). However, many specify additional thresholds where short-term action plans are used as one of the measures to help meet limit values, particularly for PM₁₀. There is a surprising variation between the levels specified in the action plans.

Some of the short-term action plans, especially in France, provide information for specific sensitive population groups (for example, children under 6 years old) when information or alert thresholds are exceeded. Generally sensitive population groups are advised to minimise their exposure by avoiding exercise and by staying indoors. None of the short-term action plans we have examined provides for additional measures to reduce concentrations in places (e.g. schools or hospitals) where the sensitive people spend their time.

The short-term action plans that we have examined provide little or no evidence that the measures will be effective in reducing the intensity, extent or duration of pollution events. The questionnaires provided an outline of some evaluation studies. These studies indicated that local short-term measures can be effective for PM₁₀ and nitrogen dioxide but are not generally effective for ozone.

The questionnaire responses indicated that short-term action plans have most frequently been implemented when PM₁₀ concentrations have exceeded information or alert levels. This information and alert levels are set by national or regional authorities and are not specified in Directive 2008/50/EC. The levels for PM₁₀ are set in order to minimise the number of exceedances of the daily limit value for PM₁₀.

Short-term action plans have been implemented in Belgium and Spain when the alert threshold has been exceeded. However, the measures taken were limited to the provision of information to the public.

None of the questionnaires responses indicated that short-term action plan measures had been initiated as the result of concentration exceeding the alert threshold for nitrogen dioxide.

Only one of the questionnaire responses (for Castilla la Mancha, Spain) indicated that short-term action plan measures had been implemented (once) as the result of concentrations exceeding the alert threshold for sulphur dioxide. The action plan requires the authorities to inform the public and large industrial installations when the alert threshold is exceeded. The industrial facilities are then required to implement a local protocol to reduce emissions.

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1 Introduction

Following the adoption of a legislative proposal in 2005, Directive 2008/50/EC on ambient air quality and cleaner air for Europe was adopted in 2008. The Directive strengthens the prevention of health risks due to air pollutants by further elaborating Member States' obligations to set up, publish and monitor short term action plans where and when there is a risk of exceedance of relevant environmental objectives. The Commission, in return, is obliged to support Member States in this process by means of publishing best practice examples focussing on the protection of sensitive population groups. Such publication is to guide Member States' efforts in identifying and implementing the most effective and efficient pollutant abatement measures.

The implementation of the Directive will be reviewed in 2013 pursuant to article 32 of the Directive. This project is also intended to provide information on the current implementation of Directive 2008/50/EC. Article 24 of the Directive 2008/50/EC specifies the obligations of Member States and the Commission with respect to short-term action plans. Article 24 is shown in Box 1.

Paragraph 1 of Article 24 requires Member States to draw up short-term action plans where there is a risk of exceeding the alert levels specified in Annex XII of the Directive. Section 2 of this report presents the results of our analysis of monitoring data contained in the European Air Quality Database (AIRBASE) for nitrogen dioxide and sulphur dioxide and in Form 13b of the questionnaires according to Decision 2004/461/EC for ozone. The aim of the analysis was to identify where there is a risk of exceeding the alert levels and so identify where the Directive may **require** the Member State to prepare short-term action plans.

Paragraph 1 also allows Member States to draw up short-term action plans where there is a risk of exceeding one or more of the limit values or target values specified in Annexes VII, XI and XIV of the Directive. Here, short-term actions may be considered to be just one of the measures they apply to meet the limit values or target values. Many Member States have submitted notifications under Article 22 of the Directive to extend the time period available for meeting the limit values. Section 3 of this report identifies where Member States have included short-term measures in their Time Extension Notifications.

Prior to this project, there was no central inventory of short-term action plans. We therefore sent a questionnaire to all Member States. The questionnaire asked Member States to provide details of:

- Existing short term action plans
- Exceedances of alert values and limit values
- Methods of risk assessment
- Forecasting methods
- Short-term measures applied
- Implementation strategies
- Communication strategies
- Impact assessment

The questionnaire is included in Appendix 1. There were 38 questionnaire returns from fourteen Member States.

Section 4 lists the short-term action plans identified from the questionnaires. Section 4 also includes a preliminary analysis of the content of these short-term action plans to identify those plans that provided:

- A clear rationale
- Clear and unambiguous implementation plans
- A procedure for assessing the effectiveness of the actions taken.

Section 5 of the report provides further analysis of the short-term action plans. In particular it considers:

- The role of measurement and forecasting
- Threshold levels for ozone, nitrogen dioxide, sulphur dioxide and particulate matter, PM₁₀
- The termination of information or alert states
- The delegation of responsibility
- Informing the public including specific actions aiming at the protection of sensitive population groups, including children
- Measures to control traffic emissions
- Measures to control emissions from other sources
- Reporting and evaluation of pollutant events
- Evaluation of the effects of measures to reduce emissions

In Section 6, we provide an example of good practice. Section 7 provides a summary of the lessons learnt from our analysis and recommendations to the European Commission based on these lessons.

Box 1 : Article 24 of Directive 2008/50/EC**Short-term action plans**

1. Where, in a given zone or agglomeration, there is a risk that the levels of pollutants will exceed one or more of the alert thresholds specified in Annex XII, Member States shall draw up action plans indicating the measures to be taken in the short term in order to reduce the risk or duration of such an exceedance. Where this risk applies to one or more limit values or target values specified in Annexes VII, XI and XIV, Member States may, where appropriate, draw up such short-term action plans.

However, where there is a risk that the alert threshold for ozone specified in Section B of Annex XII will be exceeded, Member States shall only draw up such short-term action plans when in their opinion there is a significant potential, taking into account national geographical, meteorological and economic conditions, to reduce the risk, duration or severity of such an exceedance. When drawing up such a short-term action plan Member States shall take account of Decision 2004/279/EC.

2. The short-term action plans referred to in paragraph 1 may, depending on the individual case, provide for effective measures to control and, where necessary, suspend activities which contribute to the risk of the respective limit values or target values or alert threshold being exceeded. Those action plans may include measures in relation to motor-vehicle traffic, construction works, ships at berth, and the use of industrial plants or products and domestic heating. Specific actions aiming at the protection of sensitive population groups, including children, may also be considered in the framework of those plans.

3. When Member States have drawn up a short-term action plan, they shall make available to the public and to appropriate organisations such as environmental organisations, consumer organisations, organisations representing the interests of sensitive population groups, other relevant health-care bodies and the relevant industrial federations both the results of their investigations on the feasibility and the content of specific short-term action plans as well as information on the implementation of these plans.

4. For the first time before 11 June 2010 and at regular intervals thereafter, the Commission shall publish examples of best practices for the drawing-up of short-term action plans, including examples of best practices for the protection of sensitive population groups, including children.

2 Identification of sites at risk of exceeding alert thresholds

2.1 Introduction

Article 24 paragraph 1 of the Air Quality Directive 2008/50/EC states that:

Where, in a given zone or agglomeration, there is a risk that the levels of pollutants will exceed one or more of the alert thresholds specified in Annex XII, Member States shall draw up action plans indicating the measures to be taken in the short term in order to reduce the risk or duration of such an exceedance. Where this risk applies to one or more limit values or target values specified in Annexes VII, XI and XIV, Member States may, where appropriate, draw up such short-term action plans.

This section identifies locations where there is a risk of exceeding the alert thresholds specified in Annex XII based on an analysis of the data contained in the European Air Quality Database (AIRBASE) for nitrogen dioxide and sulphur dioxide and in Form 13b of the questionnaires according to Decision 2004/461/EC for ozone.

The CAFE working group on Implementation produced a note Nr 2003/1 “Necessity to prepare action plans to reduce the duration of exceedances of alert thresholds (Art 7(3), 96/62/EC)”. This method requires an assessment of at least 5 years of data and applies the following criteria:

- If no value exceeds 80% of the alert threshold, there is no risk of exceedance
- If fewer data are available (1 - 4 years), there is no risk of exceedance if no level higher than 65% of the alert value was recorded
- If values exceed 80% of the alert threshold, the “exceedance” will be checked if it was affecting an area larger than 100km² (or covering a whole zone). This will be done using data from adjacent measurement sites. If other sites exist, but no levels are > 80% of the alert value, it will be concluded that there is no risk of exceeding the alert threshold in larger areas.
- If values exceed 80% of the alert threshold were observed in an area larger than 100km² (or covering a whole zone), it will be concluded that there is a risk of exceeding the alert threshold unless the emission situation has improved significantly in the years after the exceedances were observed.

As there are 2863 NO₂ and 1973 SO₂ monitoring stations in EU27 it is not possible to assess all stations. We have therefore carried out an initial screening process before assessing against these criteria as described below.

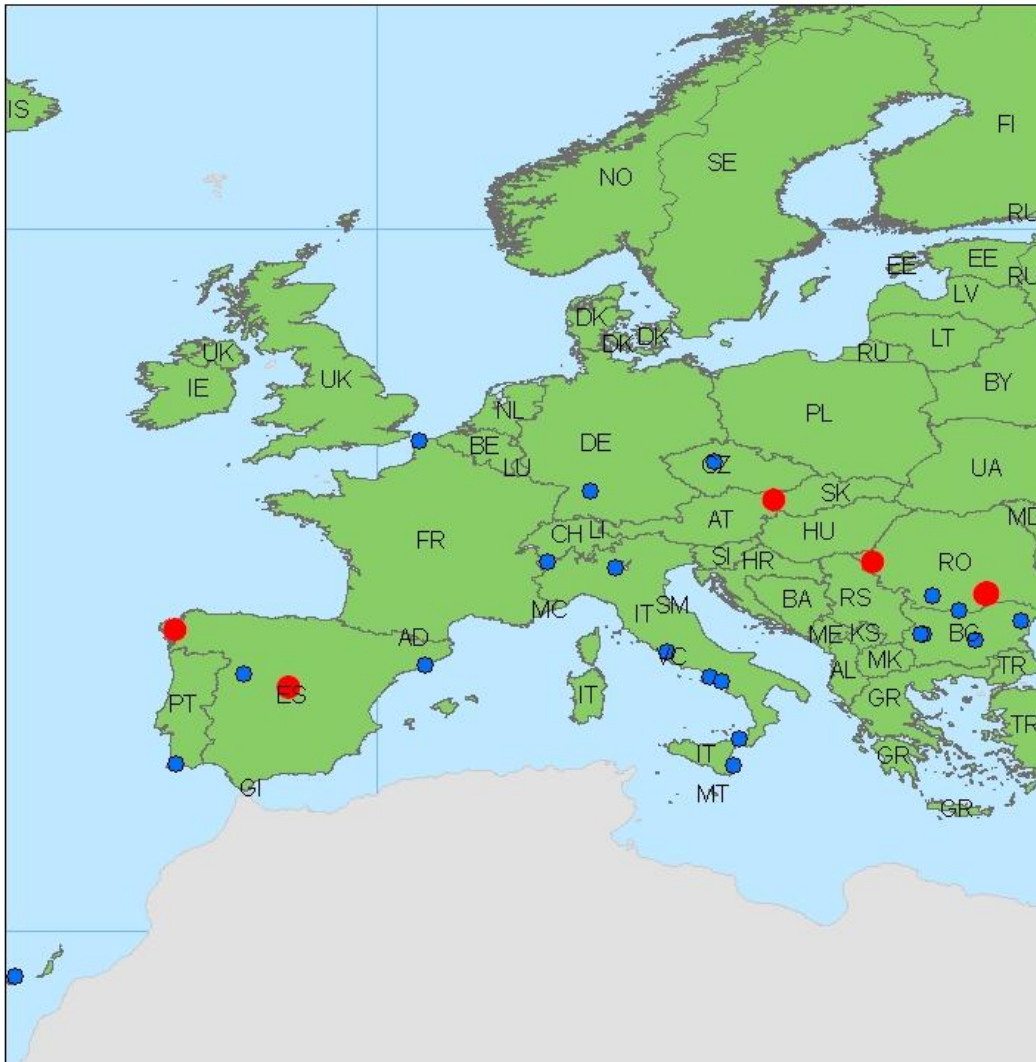
2.2 Alert thresholds for nitrogen dioxide

The alert threshold for nitrogen dioxide is exceeded when the measured concentration exceeds 400µg m⁻³ over three consecutive hours at locations representative of air quality over at least 100 km² or an entire zone or agglomeration, whichever is the smaller.

In order to limit the number of measurements sites assessed, we first identified the sites where the concentration measured over one hour exceeded 400 µg m⁻³ during the period 2005-2009 from the Airbase statistics dataset. For each of these sites, we then identified from the Airbase raw data the days when the concentration exceeded 80% of the alert value

(i.e. $320 \mu\text{g m}^{-3}$) for three consecutive hours. We also identified the days where the concentration exceeded the alert value for three consecutive hours. We then established whether there were other monitoring sites in the same agglomeration or zone and whether the concentration at other sites in the agglomeration or zone exceeded 80% of the alert value on the same day. These sites were then identified as “at risk” of exceeding the alert value over a representative area. The results of the analysis are given in Appendix 1. Table 1 shows the results for sites and days where the nitrogen dioxide concentration exceeded 80% of the alert value (i.e. $320 \mu\text{g m}^{-3}$) for at least 3 hours. Fig. 1 shows the locations of sites where the hourly concentration exceeded 80% of the alert threshold for 3 consecutive hours in a day: it also shows the sites identified by the analysis as “at risk” of exceeding the alert threshold over a representative area.

Fig. 1: Sites "at risk" of exceeding the alert threshold for nitrogen dioxide



Legend

- Sites "at risk" of exceeding alert threshold over representative area
- Individual sites >80% of alert threshold for 3hours

Table 1: Monitoring sites where the nitrogen dioxide concentration exceeded 80 % of the alert threshold over three consecutive hours

Country	Site	Zone	City	Date	>Alert value	Other sites	Other sites 80% of alert	At risk ?
Bulgaria	BG0055	BG00006	Stara Zagora	20/11/2009	N	Y	N	N
				22/11/2009	N		N	
				23/11/2009	Y		N	
				27/11/2009	Y		N	
				28/11/2009	N		N	
				06/12/2009	N		N	
				22/12/2009	Y		N	
				23/12/2009	N		N	
	30/12/2009	N	N					
	BG0052	BG00001	Sofia	21/12/2005	N	Y	N	N
			17/01/2005	N		N		
BG0013	BG00003	Devnia	12/12/2005	N	Y	N	N	
BG0050	BG00001	Sofia	14/01/2008	N	Y	N	N	
			22/01/2008	N		N		
			13/01/2009	N		N		
Czech Republic	CZ0ALEG	CZ010	Prague	18/06/2009	N	Y	N	N
Germany	DEBW118	DEZCXX0007A		16/01/2006	N	Y	N	N
				13/01/2009	N		N	
Spain	ES0116	ES1301	Madrid	19/05/2005	N	Y	N	Y
				07/11/2005	N		N	
				19/01/2008	N		N	
				18/07/2008	N		N	
				26/10/2008	N		N	
				21/12/2008	Y		N	
				22/12/2008	N		N	
				23/12/2008	Y		Y	
				25/07/2009	N		N	
				17/10/2009	N		N	
				18/10/2009	N		N	
	27/10/2009	N	N					
	29/10/2009	N	N					
	ES0117	ES1301	Madrid	23/12/2008	Y	Y	Y	Y
	ES0119	ES1301	Madrid	02/10/2009	N	Y	N	N
				24/11/2009	N		N	
ES0801	ES0901	Prat De Llobregat	23/10/2007	N	Y	N	N	
ES0886	ES0510	Telde	10/05/2007	Y	Y	N	N	
			11/05/2007	Y		N		
ES1192	ES1301	Madrid	08/11/2007	N	Y	N	N	
ES1288	ES0803	Salamanca	06/11/2006	N	Y	N	N	
			13/11/2006	N		N		
ES1429	ES1203	Santiago De Compostela	10/08/2006	N	N		Y	
			11/08/2006	Y				
			16/08/2006	N				
France	FR10024	FR11N10		17/07/2006	N	Y	N	N
Italy	IT0983	IT0201	Aosta	28/01/2005	N	Y	N	N
	IT1465	IT0301	Brescia	01/02/2006	N	Y	N	N
	IT1836	IT1201	Roma	21/12/2007	N	Y	N	N
	IT1829		Messina	15/06/2009	Y	Y	N	N
				16/06/2009	Y		N	
				17/06/2009	Y		N	
	IT1491		Napoli	12/03/2008	N	Y	N	N
	IT1504		Salerno	24/02/2008	Y	Y	N	N
25/02/2008				N				
IT1346		Siracusa	28/12/2006	N	Y	N	N	
Portugal	PT05010		Portimao	09/03/2007	Y	Y	N	N
				10/03/2007	N		N	
Romania	RO0011		Timisoara	01/01/2005	Y	N		Y
				09/01/2005	Y			

Country	Site	Zone	City	Date	>Alert value	Other sites	Other sites 80% of alert	At risk ?
	RO0066	RO081	Bucharest	20/03/2006	N	Y	Y	Y
				05/10/2006	N		N	
				17/11/2006	N		Y	
				18/10/2007	N		N	
	RO0067	RO081	Bucharest	07/12/2005	N	Y	N	Y
				30/01/2006	N		Y	
				21/02/2006	N		N	
				20/03/2006	N		Y	
				22/03/2006	N		N	
				04/10/2006	Y		N	
				27/02/2008	N		N	
				24/12/2009	N		N	
	RO0068	RO081	Bucharest	28/10/2008	N	Y	N	N
				31/10/2008	N		N	
				05/12/2008	N		N	
				06/02/2009	N		N	
	RO0069	RO081	Bucharest	20/02/2006	N	Y	N	Y
				20/03/2006	N		Y	
				09/02/2007	N		N	
				29/11/2007	N		N	
				20/02/2008	N		N	
				26/02/2008	N		Y	
	RO0070	RO081	Bucharest	01/02/2005	N	Y	N	Y
				09/02/2005	N		N	
				15/03/2005	N		N	
				17/04/2005	N		N	
				18/09/2005	N		N	
				03/10/2005	N		N	
				08/11/2005	N		N	
				26/11/2005	N		N	
				13/12/2005	N		N	
				29/12/2005	N		N	
				18/01/2006	N		N	
				30/01/2006	Y		Y	
				20/02/2006	N		N	
				02/03/2006	Y		Y	
				17/03/2006	N		N	
				20/03/2006	N		N	
				28/03/2006	N		N	
				09/04/2006	N		N	
				08/09/2006	N		N	
				14/10/2006	Y		N	
	17/11/2006	N	N					
	30/07/2007	N	N					
18/09/2007	N	N						
18/10/2007	N	N						
26/02/2008	N	Y						
RO0063		Turnu Magurele	22/10/2005	N	Y	N	N	
			02/07/2006	N				
			27/09/2006	N				
RO0079	RO401	Craiova	08/11/2006	Y	Y	N	N	
			17/11/2006	Y		N		
Slovakia	SK0052		Malacky	16/01/2009	Y	N		Y ?(street canyon)
				21/10/2009	N			
				26/11/2009	N			
				01/12/2009	N			

Table 2 provides a summary of the numbers of monitoring sites in these countries:

- With concentrations above 80% of the alert threshold for three consecutive hours on any day
- With concentrations above the alert threshold for three consecutive hours on any day
- In zones at risk of exceeding the alert threshold over a representative area

Table 2: Numbers of sites in Member States identified in the analysis

Country	No. of sites above 80% of alert value for 3 consecutive hours	No. of sites above alert value for 3 consecutive hours	No. of sites at risk
Bulgaria	4	1	0
Czech Republic	1	0	0
Germany	1	0	0
Spain	8	4	3
France	1	0	0
Italy	7	1	0
Portugal	2	1	0
Romania	8	6	5
Slovakia	1	1	1

Of the sites in Spain where the analysis indicates that there is a risk of exceeding the alert threshold over a representative area, two are in Madrid (ES0116 and ES0117) and the other site (ES1429) is in Santiago de Compostela. Note that the Airbase dataset does not include data for other sites in Santiago de Compostela for the period when the event occurred (2006) and so it is not possible to assess whether the site is representative of a wider area. All three of the sites in Spain “at risk” are traffic related sites. None of these sites is still operating.

Of the sites in Romania “at risk”, four are in Bucharest (RO0066, RO0067, RO0069 and RO0070) and one is in Timisoara (RO0011). The exceedance at the Timisoara site occurred before Romania’s accession to the EU. Most of the exceedances at the Bucharest sites also occurred before accession. Post-accession, the concentration only exceeded 80% of the alert value at more than one site in Bucharest on one day 26 February 2008, but the alert value was not exceeded.

The site in Slovakia identified at risk (SK0052) is in Malacky and the Airbase data set does not contain additional sites nearby to confirm that the site is representative of a wider area. The SK0052 site is identified in Airbase as a street canyon site.

In summary, it is expected that few, if any, of the Member States will consider that they are obliged to prepare a short-term action plan for nitrogen dioxide.

2.3 Alert thresholds for sulphur dioxide

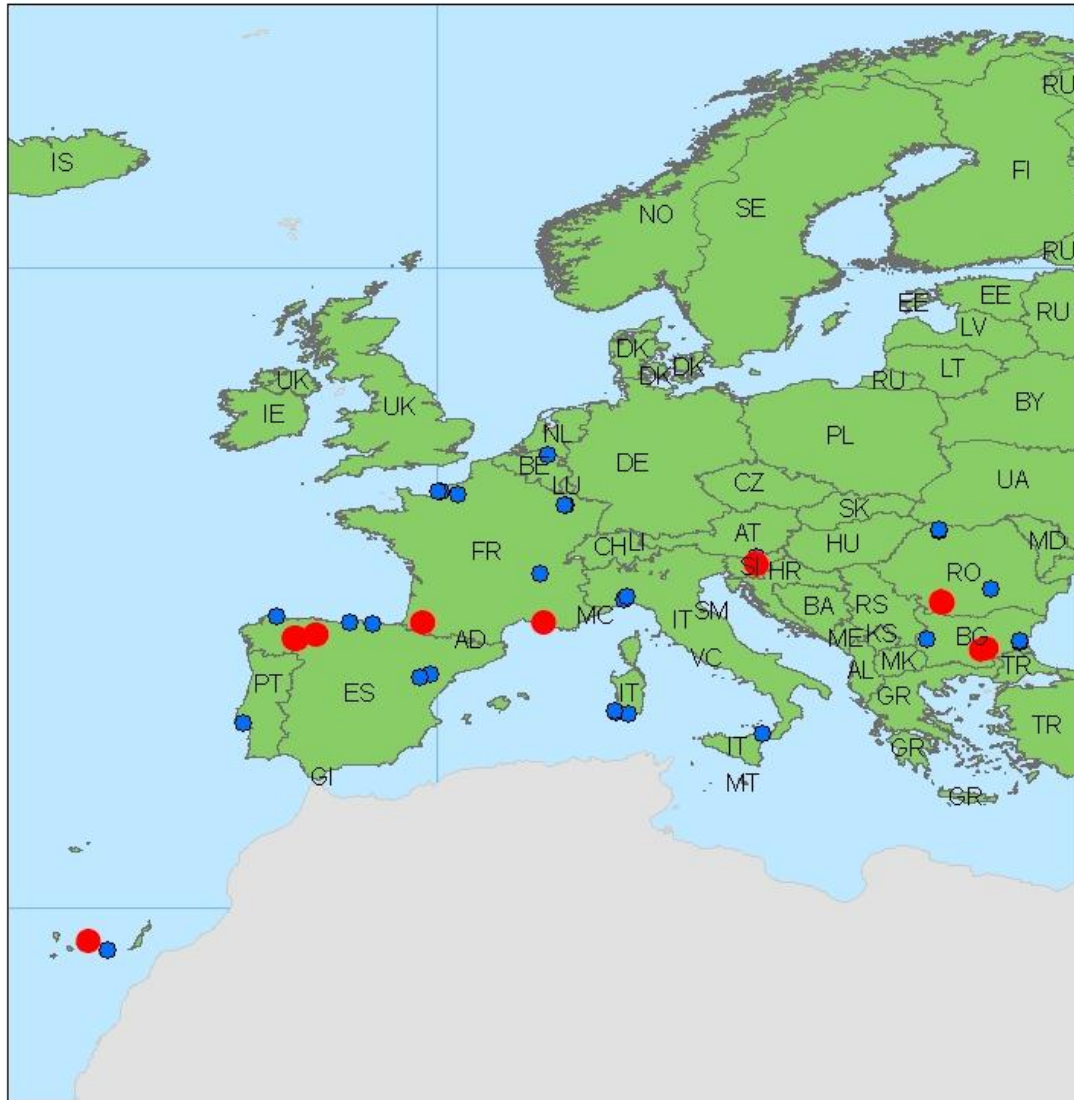
The alert threshold for sulphur dioxide is exceeded when the measured concentration exceeds $500\mu\text{g m}^{-3}$ over three consecutive hours at locations representative of air quality over at least 100 km^2 or an entire zone or agglomeration, whichever is the smaller.

In order to limit the number of measurements sites assessed, we first identified the sites where the concentration measured over one hour exceeded $500\mu\text{g m}^{-3}$ during the period 2005-2009 from the Airbase statistics dataset. We then identified those sites where the concentration exceeded $500\mu\text{g m}^{-3}$ over one hour at another site within 31.8 km

(corresponding to a circle with area 100 km^2) in the same year in order to ensure that the measurement was representative of a wider area.

For each of these sites, we then identified from the Airbase raw data the days when the concentration exceeded 80% of the alert value (i.e. $400 \mu\text{g m}^{-3}$) for three consecutive hours. We also identified the days where the concentration exceeded the alert value for three consecutive hours. We then established whether there were other monitoring sites within 31.8 km where the concentration at exceeded 80% of the alert value on the same day. Sites were considered to be “at risk” of exceeding the alert threshold over a representative area when the concentration exceeded 80% of the alert threshold both at the site and at another site within 31.8 km on the same day. The results of the analysis are given in Appendix 2. Table 3 lists the sites where the sulphur dioxide concentration exceeded 80% of the alert value (i.e $400 \mu\text{g m}^{-3}$) for at least 3 hours and identifies those sites “at risk”. Fig. 2 shows the locations of the sites.

Fig. 2: Sites "at risk" of exceeding the alert threshold for sulphur dioxide



Legend

- Sites "at risk" of exceeding the alert threshold over a representative area
- Individual sites > 80% of alert threshold for 3 hours

Table 3: Sites identified in our analysis for sulphur dioxide

Member State	Sites	At risk	City
Belgium	BELWZ01	N	Lommel
Bulgaria	BG0056	N	Burgas
	BG0044	N	Burgas
	BG0041	Y	Dimitrovgad
	BG0026	Y	Galabovo
	BG0049	N	Pernik
Spain	ES1039	N	Torrelavega
	ES0763	Y	Matallana De Torã• O
	ES1131	Y	Santa Cruz De Tenerife
	ES1132	N	Santa Cruz De Tenerife
	ES0110	N	Erandio
	ES0327	N	Calanda
	ES0373	Y	Congosto
	ES0376	Y	Sancedo
	ES0377	Y	Cabaã'As Raras
	ES0886	N	Telde
	ES1133	N	Candelaria
	ES1228	Y	Congosto
	ES1229	N	Congosto
	ES0339	N	Xove
	ES0375	Y	Sancedo
	ES0761	N	Cuadros
	ES0762	Y	Robla (La)
	ES1297	Y	Robla (La)
	ES1369	N	Montalbã• N
	ES1758	Y	Santa Cruz De Tenerife
France	FR01016	N	
	FR01015	N	
	FR05083	N	
	FR05064	N	
	FR31024	Y	
	FR31022	N	
	FR31021	N	
	FR31020	N	
	FR02034	Y	
	FR02007	Y	
	FR25034	N	
	FR31019	Y	
	FR02029	N	

Member State	Sites	At risk	City
	FR20029	N	
	FR02033	Y	
Italy	IT1575	N	Portoscuso
	IT1576	N	Portoscuso
	IT1270	N	Sarroch
	IT1269	N	Sarroch
	IT1999	N	Genova
	IT1751	N	Busalla
	IT1396	N	Portoscuso
	IT1273	N	Portoscuso
	IT0794	N	Pace Del Mela
Portugal	PT03055	N	Barreiro, Aml Sul
Romania	RO0078	Y	Craiova
	RO0079	Y	Craiova
	RO0080	Y	Craiova
	RO0081	N	Isalnita
	RO0082	Y	Breasta
	RO0162	N	Baia Mare
	RO0165	N	Zona Ferneziu
	RO0180	N	Ploiesti
Slovenia	SI0047	Y	Dobovec
	SI0049	Y	Ravenska Vas
	SI0039	N	Sostanj
	SI0035	N	Trbovlje
	SI0031	N	Zavodnje

Table 4 provides a summary of the numbers of monitoring sites in these countries:

- With concentrations above 80% of the alert threshold for three consecutive hours on any day
- In zones at risk of exceeding the alert threshold over a representative area

Table 4: Numbers of sites in Member States identified by the analysis

Country	No. of sites above 80% of alert value for 3 consecutive hours	No. of sites at risk
Belgium	1	0
Bulgaria	5	2
Czech Republic	1	0
Spain	20	9
France	15	5
Italy	9	0
Portugal	1	0
Romania	8	4
Slovenia	5	2

The two sites in Bulgaria (BG0026 and BG0041) where the analysis indicates that there is a risk of exceeding the alert threshold over a representative area are both urban background sites. The four sites in Romania identified as “at risk” (RO0078, RO0079, RO0080 and RO0082) are traffic and background sites in Craiova. Romania and Bulgaria might thus consider that they are obliged to prepare a short-term action plan for sulphur dioxide. However, it is possible that the measures taken to reduce emissions in these countries since accession in 2007 will be more effective than the use of the measures covered in short-term action plans.

Three of the sites (FR02033, FR02034 and FR02007) in France where the analysis indicates that there is a risk of exceeding the alert threshold over a representative area are industrial sites in Martigues in the South of France. The sites are less than 2 km apart and so it may be considered that the measured concentrations are not representative of a wider area.

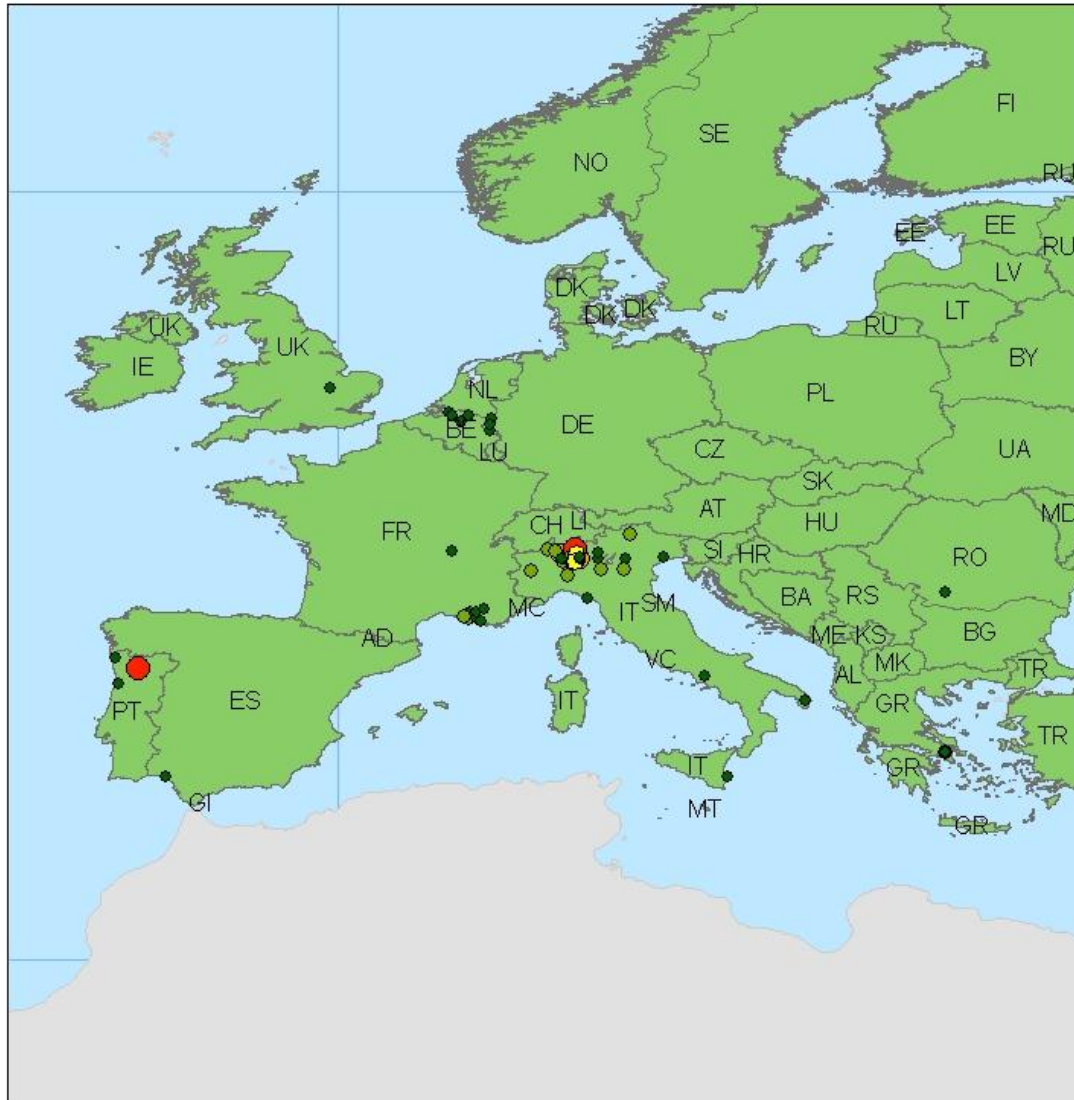
Three of the sites in Spain are traffic sites less than 1 km apart in Santa Cruz de Tenerife. The remaining sites in Spain are industrial sites in La Robla (1 km apart), Congosto (3 km apart) and Sancedo (3 km apart).

The two sites in Slovenia identified as “at risk” are industrial sites in rural areas; however, the identified potential alert event was in 2005 and so it may not be representative of the current situation.

2.4 Alert thresholds for ozone

For the implementation of Article 24, the alert threshold for ozone is exceeded when the measured or predicted concentration exceeds $240 \mu\text{g m}^{-3}$ over three consecutive hours. For this assessment, we have identified sites as being at risk of exceeding the alert threshold where the ozone concentration exceeds $240 \mu\text{g m}^{-3}$ on at least three hours in a day, based on data provided in Form 13b of the annual questionnaires 2004/461/EC. Fig. 3 shows the locations of the sites. A list of these sites can be found in Appendix 4.

Fig. 3: Sites “at risk” of exceeding the alert threshold for ozone



Number of exceedences of alert threshold 2005-2009

- 1
- 2 - 3
- 4 - 6
- 7 - 8
- 9 - 20

Commission Decision 2004/279/EC provides guidance on the drawing up of short-term action plans. *Regarding the need for short-term actions to avoid exceedance of the 240 µg/m³ threshold the (15) Member States can be split up into three groups:*

- 1. In the Nordic countries (Finland, Sweden and Denmark) and Ireland no exceedances of the alert threshold happened so far (according to data reported to European Environment Agency AIRBASE) and in view of the implementation of the abovementioned long-term policy, they are even more unlikely to happen in the future. Therefore Nordic countries and Ireland would not need to prepare short-term actions plans as there seems to be no risk of any exceedance of the alert threshold.*
- 2. Air mass transport in north-western and central European countries is most frequently dominated by advection and often gives rise to long range transboundary pollution transport. There are clear indications that for most parts of the north-western and central European countries exceedances of the alert threshold are diminishing. Short-term measures already in the mid-90s showed only a restricted reduction potential and implementation of the EU long-term strategy will necessitate the generalised and permanent application of some former short-term measures. Therefore countries in which there is no significant potential for reducing the risk of exceedances through short-term action plans would not need to prepare such plans.*
- 3. Major cities and regions in southern Member States experience, on the other hand, more often recirculation of air masses due to topography and the influence of the sea. In some cases the same air masses are recirculating several times. Due to high natural VOC emissions, emission reductions of VOC are relatively ineffective (so called 'NO_x-limited' regime). No significant trend of ozone peak values can be seen in the ensemble of rather limited and only recent time series. Moreover in those areas there is a lack of knowledge with regard to the efficiency of short-term measures. Therefore cities and/or regions in southern Europe characterised by particular orographic conditions can, in principle, locally profit from short-term measures for reducing the risk or severity of exceedances of the alert value, especially for exceptional situations of extreme O₃-episodes such as experienced in 2003.*

The analysis of the data confirms that no exceedances of the alert threshold have occurred in the Nordic countries or Ireland during the period 2005-2009. Therefore Nordic countries and Ireland would not need to prepare short-term actions plans as there seems to be no risk of any exceedance of the alert threshold.

The data shows that countries in north-western and central Europe (Belgium, Germany, Netherlands, Romania and the United Kingdom) have relatively few exceedances of the alert threshold. Many of the countries in this region (e.g. Austria, Hungary, Luxembourg) had no exceedances. The advice indicates that these countries would not need to prepare short-term action plans for ozone.

Countries in southern Europe have continued to show numerous exceedances of the alert threshold: these include Greece, France, Italy and Portugal. Cities and/or regions in these countries characterised by particular orographic conditions can, in principle, locally profit from short-term measures for reducing the risk or severity of exceedances of the alert value. Spain, however, has reported few exceedances of the alert threshold during this period and so short-term action plans for ozone according to Article 24 may not be needed in Spain.

3 Short-term measures in Time Extension Notifications

Many Member States have applied for time extensions under Article 22 of the Air Quality Directive. The time extension notifications provide details of the measures that will be applied to ensure that the air quality limit values will be achieved at the end of the time extension period. Umweltbundesamt have prepared a database of these measures. The database was interrogated in order to identify short-term measures. Here, short-term measures within an air quality plan are those measures which are not effective continuously but which become effective at times when there is a risk of high pollution levels (e.g. reduced speed limit during periods of high emission / high ambient air concentration levels).

All measures notified by Member States by the end of 2010 were used as a basis for the analysis (6169 measures in total, of which many are the same measures notified for several zones). In a first step, those measures were selected which were classified by the Member State as "short term" in Form 7 of the notification forms (1299 measures).

These measures were reviewed to identify the measures that fit the definition of short-term measures stated above. Many measures that were specified as short-term by the Member States did not fit the definition because they were implemented in a short time but not specifically at times of high pollution levels.

As a result, 57 measures remained which fit the definition. After combining measures which are the same, but were notified several times for several zones in a Member State, 12 distinct measures remain.

These distinct measures are shown in Table 5 below.

Table 5: Distinct short-term measures reported in time extension notifications

Member State	Title	Description	Number of zones
Austria	Speed limit	Variable speed limit, depending current NO ₂ and/or PM ₁₀ levels, traffic volume and meteorological conditions.	2
Austria	Driving restrictions (Diesel)	Ban on driving diesel vehicles without particle systems in parts of the agglomeration at times of high PM ₁₀ pollution (2 consecutive days > 100 µg/m ³)	1 (but not in place at present)
Belgium	Speed limit	Smog alarm (speed limit of 90 km/h at times of high PM ₁₀ pollution (2 consecutive days > 70 µg/m ³).	1
Belgium	Speed limit	Reduction of speed limits during pollution events	1
Belgium	Driving restrictions (heavy goods vehicles)	Ban of heavy trucks at certain hours during high-pollution episodes	1
Belgium	Free public transport	Free and increased public transport during high-pollution events	1
Belgium	Domestic heating	Actions relating to decreased domestic heating	1
Germany	Driving restrictions (heavy goods vehicles)	Restrictions on heavy goods vehicles during high pollution events	1
France	Driving restrictions (unspecified)	Driving restrictions in case of high pollution	1
Hungary	Commercial and residential measures	Smog alert plan targeting commercial and residential emissions	1
Italy	Driving restrictions	Anti-smog provisions (Total ban on driving if the value of PM ₁₀ is higher than the legal limits for 3 consecutive days)	1
Poland	Street cleaning in rainless periods	Intensification of periodic cleaning of streets, especially during long rainless periods	27

It can be seen that seven Member States notified measures that fit the definition of short-term measures. The other Member States either focus on longer-term measures in pollution abatement or they include all short-term measures in short-term action plans exclusively.

As also can be seen from the table, these measures can be structured in four categories:

- Speed limits
- Driving restrictions
- Commercial and residential
- Other traffic-related measures (free public transport; street cleaning)

From the detailed description of the measures, it is evident whether the measures address PM₁₀, NO₂ or both pollutants. The result is shown in Fig. 4 below. It has to be noted that the measures analysed here are part of PM₁₀ notifications and additional measures addressing NO₂ only may exist but were not notified.

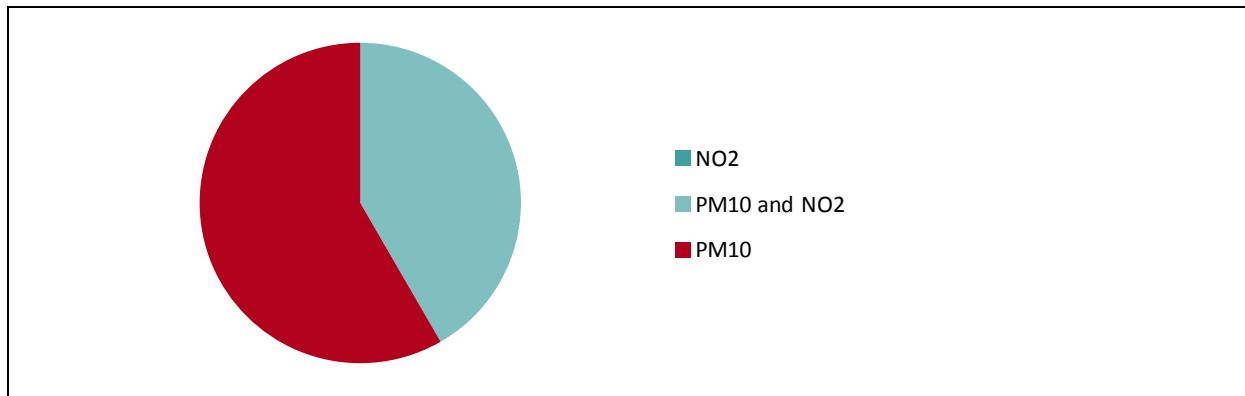


Figure 4: Measures that address PM_{10} , NO_2 or both pollutants. Note: Of the measures provided with time extension notifications and analysed here, none addressed NO_2 only.

Looking at the traffic measures in more detail, it can be seen that some address passenger cars / light duty vehicles only (reduction of speed limit from 130 to 100 km/h affects these vehicle categories only). On the other hand, the driving restrictions in Belgium and France target heavy goods vehicles specifically.

Of the measures analysed here, none seems to specifically target sensitive populations. The effect of these measures is noticed along roads and in urban areas, not specifically at locations where sensitive population groups are exposed.

4 Inventory of short-term action plans

4.1 Introduction

Member States that have prepared short term action plans were identified from:

- The results of the questionnaire sent to all Member States
- Review of Time Extension Notifications (TEN)

This chapter provides a list of the short-term action plans and presents the results of our preliminary analysis.

4.2 Inventory of short-term action plans

Table 6 lists the short-term action plans that we have identified and have obtained copies of as the result of our analysis of the TEN and the questionnaires. Most of the short-term action plans we have examined have been developed in three countries: Belgium, France and Hungary.

Table 6: List of short-term action plans examined

No.	Member State	Region	Pollutants	Name of plan	Originating organisation	Date
1	Belgium	National	Ozone	Ozone and heatwave plan	Federal Public Service (FPS) Health, Food Chain Safety and Environment	
2	Belgium	National	PM10, NO2	Protocole de coordination entre les 3 régions et CELINE lors d'épisodes de pollution	Les Ministres de l'Environnement de la Région flamande, wallonne, Bruxelles-Capitale	02/09/2008
3	Belgium	Flanders	PM10, NO2		Flemish Environment, Nature and Energy Department	
4	Belgium	Brussels	PM10, NO2	November 27, 2008. - Government Decree of the Brussels-Capital determining the emergency measures to prevent air pollution peaks by microparticles and nitrogen dioxides	Gouvernement de la Région de Bruxelles-Capitale	27/11/2008
5	Belgium	Walloon	PM10	Plan d'actions en cas de pic de pollution par les poussières fines	Agence Wallonne d'air et du climate	
6	Czech Republic	National		Decree of 16 Sept 2002	Ministry of Environment	16/12/2002
7	Finland	Helsinki	NO2, PM10, O3, PM2.5	Short-term action plan for a sudden deterioration of air quality in the Helsinki Metropolitan Area	HSY Helsinki Region Environmental Services Authority	17/12/2010
8	France	Chartres	NO2, PM10, SO2, O3	Mesures Departementale d'Urgence en cas de Pollution Atmospherique	Prefecture d'Eure-et-Loir service Interministeriel de Defense et de Protection Civile	14/04/2008
9	France	Base Normandy	O3, PM10	ANNEXE ORSEC SPECIALISEE « POLLUTION ATMOSPHERIQUE »	Prefecture de la Manche	20/04/2008
10	France	Bourges	NO2, PM10, SO2, O3	Arrete No 2008.1.1016 du 3 September 2008. Definissant les mesures d'urgence en cas de pollution atmospherique dans le agglomeration de Bourges	Prefecture du Cher Direction de la Reglement Generale et de l'Environnement	03/09/2008
11	France	Chateauroux	NO2, PM10, SO2, O3	Arrete No 2008.07.190 du 24 July 2008. Definissant les mesures d'urgence en cas de pollution atmospherique dans le agglomeration (Chateauroux agglomeration)	Prefecture de l'Inde Direction des Services de Cabinet	24/07/2008
12	France	Tours	NO2, PM10, SO2, O3	Arrete fixant les mesures d'urgence et d'information du public en cas de pollution atmospherique	Prefecture d'Indre-et-Loire	03/09/2008

No.	Member State	Region	Pollutants	Name of plan	Originating organisation	Date
13	France	Blois	NO2, PM10, SO2, O3	Arrete No 2009.50.25 . Definissant les mesures d'urgence en cas de pollution atmospherique	Prefecture de Loir-et-Cher	19/02/2009
14	France	Orleans	NO2, PM10, O3	Arrete No 08.33 . Definissant les mesures d'urgence en cas de pollution atmospherique	Prefecture du Loiret	23/07/2008
15	France	alsace	NO2, PM10, O3, SO2	Gestion de la qualité de l'air en Alsace - Aspects réglementaires	Prefet de la Region Alsace Direction Regionale de la Environnement, de l'Amenagement et do Logement	1998-2005
16	France	Calvados	PM10, O3	PROCEDURE D'INFORMATION, DE RECOMMANDATION ET D'ALERTE DE LA POPULATION EN CAS DE POLLUTION ATMOSPHERIQUE (OZONE ET PARTICULES)	PREFECTURE DU CALVADOS DIRECTION REGIONALE DE L'INDUSTRIE, DE LA RECHERCHE ET DE L'ENVIRONNEMENT	Jul-08
17	France	Ile de France	NO2, PM10, SO2, O3	Arrêté inter-préfectoral n°2007-21277 du 3 décembre 2007 relatif à la procédure d'information et d'alerte du public en cas de pointe de pollution atmosphérique en région d'Ile-de-France.	Prefecture de Police	03/12/2007
18	France	Brive la Gaillard	NO2, SO2,O3	Procédures d'information, de recommandations et d'alerte et mesures d'urgence en cas de pics de pollution atmosphérique dans les agglomérations de Brive-la-Gaillarde et de Tulle.	Préfecture de la Corrèze	11/05/2005
19	France	Creuse	PM10	Relatif aux procédures d'information, de recommandations et d'alerte en cas de pics de pollution atmosphérique par les particules en suspension dans l'air dans la ville de Guéret	Prefecture de la Creuse	20/06/2008
20	France	Limousin	PM10	relatif aux procédures d'information, de recommandations et d'alerte en cas de pics de pollution atmosphérique par les particules en suspension dans l'air dans la communauté d'agglomération de LIMOGES Métropole, la commune de COUZEIX et la ville de SAINT-JUNIEN	PREFET DE LA REGION LIMOUSIN, PREFET DE LA HAUTE VIENNE	24/06/2008
21	France	Martinique	NO2, PM10, SO2, O3	Instituant une procédure d'information et de recommandation ainsi que d'alerte du public en cas de dépassement de seuils de d'ozone, de dioxyde d'azote, dioxyde de soufre ou de poussières présents dans l'air de l'agglomération de fort deconcentration de France	Prefecture de la Region Martinique	14/06/2005
22	France	Bouches-de-Rhone	NO2, SO2		Prefecture des Bouches-de-Rhone	02/08/2002
23	France	Provence Alpes Cote d'Azur	O3	relatif a la procedure d'information et d'alerte du public et a la mise en oeuvre progressive de mesures d'urgence en cas de pollution atmospherique a l'ozone en region Provence Alpes Cte d'Azur at	Prefecture de la region Provence Alpes Cote d'Azur	03/06/2004

No.	Member State	Region	Pollutants	Name of plan	Originating organisation	Date
				dans le departement du Gard		
24	France	Provence Alpes Cote d'Azur	, PM10	relatif a la procedure d'information et d'alerte du public en cas de pointe de pollution atmospherique aux particules en region Provence Alpes Cte d'Azur	Prefecture de la region Provence Alpes Cote d'Azur	05/09/2008
25	Italy	Bolzano	PM10, O3	REGOLAMENTO SULLA QUALITÀ DELL'ARIA	President of Bolzano province	14/09/2006
26	Poland Śląskie	Śląskie		SAP in draft		
27	Spain Catalunya	Catalunya	Ozone	COOPERATION AGREEMENT BETWEEN THE DEPARTMENT OF ENVIRONMENT AND HOUSING (DMAH) Tarragona Chemical Industry Association (AEQT)	Generalitat de Catalunya Departament de Territori i Sostenibilitat	
28	Spain castilla la mancha	Castilla-La Mancha	O3, SO2, NO2	PROTOCOLO PARA LA INFORMACIÓN DE EPISODIOS DE CONTAMINACIÓN	Junta de Comunidades de Castilla-la Mancha	
29	Spain castilla la mancha	Castilla-La Mancha	SO2	PROGRAMA DE REDUCCIÓN DE DIÓXIDO DE AZUFRE EN PUERTOLLANO	Junta de Comunidades de Castilla	
30	Spain castilla la mancha	Castilla-La Mancha	PM10	PROGRAMA DE REDUCCIÓN DE PARTÍCULAS PM10 EN PUERTOLLANO	Junta de Comunidades de Castilla	
31	UK :Wales	South Wales	PM10	Short term actions the Welsh Ministers will consider taking when they consider that there is a risk that a limit value, or alert threshold will be exceeded.	Welsh Assembly Government	
32	Hungary	Debrecen	NO2,O3,SO2,C O, PM10	Debrecen pollution alert plans	Debrecen Municipality Assembly	01/01/2010
33	Hungary	Dorog	NO2,O3,SO2,C O, PM10	Dorog pollution alert plans	Dorog City Assembly	26/02/2010
34	Hungary	Miskolc	NO2,O3,SO2,C O, PM10	City of Miskolc special air quality control action plan	Municipality of Miskolc	25/06/2009
35	Hungary	Pecs	NO2,O3,PM10	City of Pecs pollution alert action plan	Pecs Municipality Assembly	05/11/2009

No.	Member State	Region	Pollutants	Name of plan	Originating organisation	Date
36	Hungary	Salgotarjan	NO ₂ , PM ₁₀ , SO ₂ , O ₃	Salgotarjan city pollution alert plan	Salgotarjan City Assembly	24/11/2009
37	Hungary	Sopron	NO ₂ , O ₃ , SO ₂ , CO, PM ₁₀	Sopron city pollution alert plan	Sopron City Assembly	
38	Hungary	Székesfehérvár	NO ₂ , O ₃ , SO ₂ , CO, PM ₁₀	Székesfehérvár city pollution alert plan	Székesfehérvár Municipality Assembly	14/12/2010
39	Hungary	Veszprem	PM ₁₀	Veszpremcity pollution alert plan	General Assembly of the Municipality of Veszprém County	29/04/2011

4.3 The features of a good short-term action plan

The Commission is required to publish good examples of short term action plans and also good examples that relate to measures to increase the protection of sensitive populations including children.

We carried out a preliminary examination of the short-term action plans in order to identify examples of good practice. We assessed the short-term action plans in terms of their:

1. Rationale
2. Implementation
3. Monitoring and Evaluation

This section identifies ten features (a-j) of a “good” short-term action plan. The analysis also identifies the short-term action plans that provide specific measures to increase the protection of sensitive populations.

4.3.1 Rationale

A good short-term action plan should show that:

- a) there is a risk that short-term information/recommendation or alert threshold values or limit values will be exceeded.
- b) the action plan addresses the most appropriate sources of emission.
- c) the measures in the action plan will be effective in reducing pollutant concentrations.
- d) there is a legal basis for the actions.

4.3.2 Implementation

ST action plans are essentially emergency response plans for episodes, or potential episodes, of exceptionally high pollution levels. It is therefore critical that these plans are set out with clear aims and criteria triggering short term measures, with specific measures to rapidly reduce emissions over the short term. A good short-term action plan should specify:

- e) **Who** is responsible for initiating the actions, for delegating actions to others and for terminating the actions.
- f) **What** actions will be taken to reduce emissions or to provide information and recommendations.
- g) **When** will the actions be initiated or terminated, for example when measured or forecast concentrations exceed information or alert values.
- h) **Where** will the measures be applied.
- i) **Why** are the measures applied (e.g. to provide the public with information; to reduce emissions)

4.3.3 Monitoring and Evaluation

Short-term actions to reduce pollutant concentrations can involve considerable cost to local administrations and inconvenience to members of the public. It is therefore important that the measures taken are reviewed on a regular basis. A good short term action plan should specify:

- j) how the effectiveness of the measures taken will be monitored and evaluated.

4.3.4 Results of the preliminary analysis

Table 7 shows which of the short-term action plans in the inventory include the features of a good short-term action plan identified above.

In general, the short-term action plans include little in terms of their rationale. Nearly all provide details of the legal basis and authority for the action plan. However, few of the action plans provide information on the risk of exceeding the information or alert thresholds or the limit values. In Hungary, for example, all cities with more than 200, 000 inhabitants have to prepare short term action plans irrespective of their air quality situation. The Belgian protocol for coordination between the Flemish, Walloon and Brussels regions provides details of the numbers of exceedances of thresholds in 2006 and 2007. The Finnish short-term action plan for Helsinki provides some examples of when the thresholds were recently exceeded. The draft short-term action plan for the Slaskie Voivodship in Poland includes details of the number of exceedances of alert thresholds for PM₁₀ that have occurred in recent years.

The short term action plans that we have examined do not themselves refer in general to studies to determine the risk of exceeding alert thresholds, source apportionment studies or studies to show that short-term measures will be effective. However, the questionnaires indicate that this information is available elsewhere in some cases. For example, the annual report "Air Pollution in the Czech Republic In 2009" Czech Hydrometeorological Institute - Air Quality Protection Division presents a review¹ of the operation of the short-term action plan (Smog regulation system) each year. The Atmopaca report² "Impact de la Reduction de Vitesse sur la Pollution Par L' Ozone" presents the results of ozone concentration measurements during 2006 in the Provence Alpes-Cote d'Azur region of France and a modelling assessment of the impact of a reduction in vehicle speeds on ozone pollution.

The short-term action plans in most cases provide detailed implementation plans. They provide clear guidance on:

- the responsibilities of each of the authorities,
- the actions that will be taken when information and alert thresholds are exceeded or exceedances are forecast,
- the criteria used to initiate and terminate the action plan operation
- the geographical extent of the action plan measures
- the purpose of the measures taken as part of the action plan

The implementation plans are analysed in more detail in the following chapters of this report.

The short-term action plans prepared for various regions of France have many features in common. Similarly, the short-term action plans developed in Hungary share many common features. We have therefore, considered the French and Hungarian action plans as a whole rather than individually in the following section of this report.

The air quality monitoring station networks provide the basis for monitoring concentrations throughout the duration of the alert. The short-term action plans for many regions of France stipulate that a report on the alert is prepared, typically within a week.

¹ <http://portal.chmi.cz/files/portal/docs/uoco/isko/grafroc/groce/gr09e/aobsah.html>

² http://www.paca.developpement-durable.gouv.fr/IMG/pdf/rapport_etude_ozone_cle014deb.pdf

Table 7: Preliminary analysis of short-term action plans

No.	Member State	Area	Rationale				Implementation					Evaluation	Identifies groups at risk
			Shows that risk of exceedance exists	Shows that the important sources are addressed	Demonstration of effectiveness	Legal basis shown	Specifies who is responsible	Specifies the actions to be taken	Specifies when the actions will be taken	Specifies where measures will be applied	Describes why measures are necessary	Specifies monitoring and evaluation	
1	Belgium	National	✓				✓	✓	✓	✓	✓		✓
2	Belgium	National				✓	✓	✓	✓	✓	✓		
3	Belgium	Flanders		✓	✓			✓	✓	✓	✓		
4	Belgium	Brussels				✓	✓	✓	✓	✓	✓	✓	
5	Belgium	Walloon				✓	✓	✓	✓	✓	✓		
6	Czech Republic	National				✓	✓	✓	✓	✓	✓	✓	✓
7	Finland	Helsinki	✓			✓	✓	✓	✓	✓	✓	✓	
8	France	Chartres		✓		✓	✓	✓	✓	✓	✓		✓
9	France	Base Normandy				✓	✓	✓	✓	✓	✓		✓
10	France	Bourges				✓	✓	✓	✓	✓	✓	✓	✓
11	France	Chateauroux				✓	✓	✓	✓	✓	✓	✓	✓

No.	Member State	Area	Rationale				Implementation					Evaluation	Identifies groups at risk
			Shows that risk of exceedence exists	Shows that the important sources are addressed	Demonstration of effectiveness	Legal basis shown	Specifies who is responsible	Specifies the actions to be taken	Specifies when the actions will be taken	Specifies where measures will be applied	Describes why measures are necessary	Specifies monitoring and evaluation	
12	France	Tours				✓	✓	✓	✓	✓	✓	✓	✓
13	France	Blois				✓	✓	✓	✓	✓	✓	✓	✓
14	France	Orleans				✓	✓	✓	✓	✓	✓	✓	✓
15	France	Alsace				✓	✓	✓	✓	✓	✓	✓	✓
16	France	Calvados				✓	✓	✓	✓	✓	✓		✓
17	France	Ile de France				✓	✓	✓	✓	✓	✓		✓
18	France	Brive la Gaillard				✓	✓	✓	✓	✓	✓		
19	France	Creuse				✓		✓					
20	France	Limousin				✓		✓					
21	France	Martinique				✓	✓	✓	✓	✓			
22	France	Bouches-de-Rhone				✓	✓	✓	✓	✓			
23	France	Provence Alpes				✓	✓	✓	✓	✓			✓

No.	Member State	Area	Rationale				Implementation					Evaluation	Identifies groups at risk
			Shows that risk of exceedance exists	Shows that the important sources are addressed	Demonstration of effectiveness	Legal basis shown	Specifies who is responsible	Specifies the actions to be taken	Specifies when the actions will be taken	Specifies where measures will be applied	Describes why measures are necessary	Specifies monitoring and evaluation	
		Cote d'Azur											
24	France	Provence Alpes Cote d'Azur				✓	✓	✓	✓	✓			✓
25	Italy	Bolzano				✓	✓	✓	✓	✓			
26	Poland	Śląskie				✓	✓	✓	✓	✓			✓
27	Spain	Catalunya				✓	✓	✓	✓	✓			
28	Spain	Castilla-La Mancha				✓	✓	✓	✓	✓			
29	Spain	Castilla-La Mancha	✓	✓									
30	Spain	Castilla-La Mancha	✓	✓									
31	UK	South Wales											
32	Hungary	Debrecen				✓	✓	✓	✓	✓			

No.	Member State	Area	Rationale				Implementation					Evaluation	Identifies groups at risk
			Shows that risk of exceedance exists	Shows that the important sources are addressed	Demonstration of effectiveness	Legal basis shown	Specifies who is responsible	Specifies the actions to be taken	Specifies when the actions will be taken	Specifies where measures will be applied	Describes why measures are necessary	Specifies monitoring and evaluation	
33	Hungary	Dorog				✓	✓	✓	✓	✓			
34	Hungary	Miskolc				✓	✓	✓	✓	✓			
35	Hungary	Pecs				✓	✓	✓	✓	✓			
36	Hungary	Salgotarjan				✓	✓	✓	✓	✓			
37	Hungary	Sopron				✓	✓	✓	✓	✓			
38	Hungary	Székesfehérvár				✓	✓	✓	✓	✓			
39	Hungary	Veszprem				✓	✓	✓	✓	✓			

5 Further analysis of short-term action plans and questionnaire responses

5.1 Introduction

This section provides more detailed analysis of specific aspects of the short-term action plans and questionnaire responses. It considers:

- The role of measurement and forecasting
- Threshold levels for ozone, nitrogen dioxide, sulphur dioxide and particulate matter, PM₁₀
- The termination of information or alert states
- The delegation of responsibility
- Informing the public including specific actions aiming at the protection of sensitive population groups, including children
- Measures to control traffic emissions
- Measures to control emissions from other sources
- Reporting and evaluation of pollutant events
- Evaluation of the effects of measures to reduce emissions

5.2 The role of measurement and forecasting

Short-term action plans are implemented when measured concentrations exceed specified thresholds. However, the use of measured concentrations alone may result in actions only being taken after the pollution event has passed. Many short-term action plans therefore take account of pollution forecasts, based on the analysis of meteorological forecasts or computer models of pollutant formation and dispersion. Table 8 provides a summary of the information about forecasting methods provided by Member States in response to our questionnaire.

Table 8: Air pollution forecasting methods used in Member States

Country /Region	Description of forecasting methods
Austria	Daily forecast for ozone, but not related to short-term action plan. AT has occasionally been exceeded in a single zone, but has never been exceeded in the other zones since the beginning of measurements in the early 1990ies. No regular risk assessment for LV/TV.
Belgium	Daily forecasts using the deterministic CHIMERE and AURORA chemical transport models the neural network models OVL (for particulate matter PM10) and SMOGSTOP (Ozone) model results from other institutions available on different websites
Czech Republic	Air pollution level is not directly predicted in Czech Republic because the performance of the present forecasting methods/models is not satisfactory. Correlation studies of the meteorological conditions and air quality were provided and the typical situations leading to high pollution episodes in particular regions were selected. Forecasting of the air pollution episodes occurrence probability is based on the meteorological forecast solely, issuing of signals is strictly conditioned by the monitored limit violation. Only a signal repeal based on the meteorological forecast is allowed.
Denmark	Forecast modelling is carried out by the national environmental research institute (NERI). There is a brief description of the forecast model in English available on the internet: http://www2.dmu.dk/1_Viden/2_miljoe-tilstand/3_luft/4_spredningsmodeller/5_Thor/default_en.asp A key use of the model is prediction of exceedances of the information threshold for ozone.
Finland	HSY (Helsinki Region Environmental Services authority) is responsible for air quality monitoring in the Helsinki Metropolitan Area. HSY gets forecasts from the Finnish Meteorological Institute (FMI) concerning unfavourable meteorological conditions when air quality is expected to deteriorate either due to local or long-range transported pollution. HSY assesses the probability of long-range transport of fine particles and ozone with the help of the FMI's SILAM model (http://www.ilmanlaatu.fi/ilmany/silam/). The forecasts for unfavourable meteorological conditions and the SILAM model help the preparedness to act but they are not very accurate. Therefore, HSY does not send announcements of poor air quality to the public solely on the basis of these forecasts.
France Aquitaine	No assessment of the risk of exceeding alert thresholds
France-Centre	Deterministic methods are used to determine the risk of exceeding alert thresholds. However, only projections are used to determine the risk of exceeding target values or limit values. Forecasts of ozone episodes are relatively reliable. The important events of PM pollution are often underestimated.
France Alsace	No (exceeding forecast for the next day with models of the ASPA available on their website home page, but onset of MU on observation at present)
France Bas Normandie	To date, the action plan measures have been initiated based on measured concentrations. However, early warning of high concentrations is given by forecasts (PREVAIR platforms and Esmeralda).
France Bretagne	Use of the model PREVAIR
France Ile de France	Airparif provide a forecast for the day ahead for all pollutants. The work is based on the prediction forecasting tools developed by Airparif and skills of the forecaster to interpret weather data coupled to changes in the concentrations measured and modeled the same day and the next day.
France Limousin	For ozone, LIMAIR uses the model output PREVAIR (INERIS) to make its predictions. Modeling of ozone is fairly reliable although there is a slight overestimation of the mean values. Other pollutants NO ₂ , PM ₁₀ can be forecast in the same way but the reliability is lower especially for NO ₂ .
France Martinique	Forecasts are based on PREVAIR modelled predictions of dust concentrations and measured PM ₁₀ trends.
France Provence Alpes Cote d'Azur	The AIREM Mediterranean (www.air-mediterrane.org) model provides a daily forecast of air quality at the regional level for several pollutants (ozone, nitrogen oxides and particulates). The model is validated every year by a comparison between field measurements and simulation results.
France Rhone Alpes	The forecast is based primarily on the outputs of the PREVALP suite of models if necessary corrected by the expertise of a forecaster. Currently, calculations PREVALP are available once a day, around 9:30 or so. The forecast is available for three pollutants: nitrogen dioxide, ozone and PM ₁₀ .
Hungary	The Hungarian Meteorological Service provides weather forecasts - usually nation wide ones twice a week but much more often before and during smog situations. One city, Pécs started to introduce air quality model.

Country /Region	Description of forecasting methods
Italy Tuscany	Weather conditions and in particular the height of the mixing layer (PBL) is the main factor for determining the concentrations of various pollutants in the short term. The Region of Tuscany, and in accordance with the financial support of the Ministry of the Environment (project PATOS) is conducting a study in order to correctly define the parameters of correlation between the PBL and the PM10 concentration measurements in order to arrive at a system forecasting for this pollutant.
The Netherlands	The model Lotos-Euros (LE; www.lotos-euros.nl) is used to forecast air quality levels for ozone and particulate matter in the Netherlands. LE is a regional Eulerian chemical transport model (CTM). The concentrations in the grid are calculated from emissions, chemical reactions and meteorology. The models PROZON and PROPART are used as a back up. These models make use of statistical information concerning pollutant concentrations and meteorological conditions from the past, in combination with actual monitoring data and weather forecasts. These models produce daily mean concentrations for monitoring locations that are part of the national ambient air monitoring network.
Poland Malopolska	Forecasts GEM-AQ model, 5x5km density, for the whole Malopolska region. The time perspective for the prognosis is 69 hours from 3 of the current day to 24 of the day after tomorrow. Prognoses has been conducted since November 2010 and there has yet been no detailed comparative analysis of the prognoses with the measurement results
Poland Slaskie	The short-term air pollution prognosis is prepared on a daily basis, by the Institute of Meteorology and Water Management
Spain Catalunya	The University of Barcelona (UB) has implemented the air quality model AQM.cat, which couples the models MM5 (meteorological model), MNEQA (emission model developed by the Department of Astronomy and Meteorology of the UB) and CMAQ (photochemical model). http://www.ub.edu/mair/about-mair.php . In this model, the UB, have identified some errors in the forecasts. Two changes are proposed which in turn can improve the modeling system. These modifications include replacing the MM5 model for the new generation WRF model and significantly improve the model of emissions in the D2 domain (horizontal resolution of 9 km) system.
Sweden Gothenburg	We make short term weather predictions for the municipality. A number of meteorological variables are evaluated to predict the risk of high levels of PM10 the following day. If the risk is high, dust binding (through spreading magnesium-chloride) is carried out on the most vulnerable streets. This method is used during our "PM10 season", February-April.
Sweden Stockholm	For PM2.5 and Ozone we used the regional scale model Match run by SMHI. The results might be modified manually if there seems to be discrepancies for the model compared with the observations for the last 24 hours. The forecasts are updated daily and give one value for urban background and one for regional background. The forecast for PM10 is manually made and based on the meteorological forecast for the upcoming day. The street surface wetness is the most important parameter together with wind speed. The forecast will also largely be based on time of year since high concentrations of road dust occurs during wintertime when studded tyres are used and road sanding occurs. Dry streets during winter and springtime might therefore cause high PM10 levels. The forecast also depends on traffic density which varies between weekdays and weekends. As a complement is the Match model for PM2.5 used as indicator of potential higher concentrations from long-range transport. The forecast for NO2 is manually made and based on the meteorological forecast for the upcoming day. Most important factor is wind speed. The forecast also depends on traffic density which varies between weekdays and weekends. Forecasts for NO2 and PM10 are updated two times a day and are valid for the current and coming days. Forecasts are only made as one value for all busy streets, where the highest concentrations occurs.
United Kingdom	The pollution forecast is produced using near real time measurements and modelled data including back trajectories, weather forecasts and air quality model data from the Community Multiscale Air Quality model (CMAQ). The forecast is produced for the following pollutants: ozone, nitrogen dioxide, sulphur dioxide, carbon monoxide and PM ₁₀ . The forecast is reviewed and updated twice a day.

5.3 Threshold levels for ozone

Annex XII of Directive 2008/50/EC sets an information threshold for ozone of $180 \mu\text{g m}^{-3}$ as an hourly mean and an alert threshold of $240 \mu\text{g m}^{-3}$ measured or predicted as an hourly mean to be exceeded for three consecutive hours.

Generally, the short-term action plans use the information threshold as the trigger to initiate an information level response whereby the public are informed by means of radio, television, newspapers or the Internet as required by Article 19 of the Directive. Most of the short-term

action plans, decide to inform the public when the information threshold is exceeded at a single monitoring station. However, several of the French plans (e.g. for Orleans, Blois and Tours) only inform the public when at least two monitoring stations have exceeded the threshold. Many of the plans in France and in Belgium also decide to inform the public when pollution forecasts (produced by a specified organisation) predict the information threshold will be exceeded within the next 24 hours.

Generally, the short-term action plans use the alert threshold as the trigger to initiate an alert level response whereby the public are provided with further information and in some cases further measures to reduce emissions are taken. In France and Belgium these actions are initiated either on the basis of measured concentrations at monitoring sites or on the basis of pollution forecasts. In addition, some of the French short term action plans introduce further alert levels for ozone. Typically these are:

- 2nd alert level: 300 $\mu\text{g m}^{-3}$ measured or predicted as an hourly mean to be exceeded for three consecutive hours
- 3rd alert level: 360 $\mu\text{g m}^{-3}$ measured or predicted as an hourly mean

These additional levels provide the basis for a graduated response with more measures applied as the concentration increases beyond the alert threshold.

Many of the French short term action plans also include a lower threshold of vigilance, typically 150 $\mu\text{g m}^{-3}$ as an hourly mean, to warn services in advance of possible exceedance of the information or alert thresholds.

5.4 Threshold levels for nitrogen dioxide

Annex XII of Directive 2008/50/EC sets an alert threshold of 400 $\mu\text{g m}^{-3}$ measured or predicted as an hourly mean to be exceeded for three consecutive hours. Article 24 of the Directive gives Member States the option to develop short term action plans where there is a risk that the limit value for nitrogen dioxide will be exceeded. The relevant limit value for nitrogen dioxide is 200 $\mu\text{g/m}^3$ as an hourly mean not to be exceeded more than 18 times a calendar year.

Most of the short-term action plans for nitrogen dioxide introduce thresholds below the alert threshold that trigger measures to reduce concentrations or exposure of members of the public. These actions are optional under Article 24 of the Directive. The thresholds adopted differ between countries and regions. Table 9 shows examples of the range of thresholds and the actions taken when they are exceeded.

Table 9: Examples of thresholds and actions for nitrogen dioxide

Region	Level	Threshold	Possible actions initiated
Brussels	Level 1	150 $\mu\text{g m}^{-3}$ as the maximum hourly mean on two consecutive days, with the level exceeded at two or more stations on the first day	Speed limits
	Level 2	200 $\mu\text{g m}^{-3}$ as the maximum hourly mean on two consecutive days, with the level exceeded at two or more stations on the first day	Limits on circulation for odd/even number plates Heavy duty vehicle restrictions Free public transport Restrictions on heating of public buildings
	Level 3	400 $\mu\text{g m}^{-3}$ as the maximum hourly mean on two consecutive days, with the level exceeded at two or more stations on the first day	More stringent restrictions on circulation
Tours	Vigilance	150 $\mu\text{g m}^{-3}$ for 1 hour at 3 sites	Inform responsible parties
	Information	200 $\mu\text{g m}^{-3}$ for 1 hour at 2 sites	Inform public Identify fixed sources
	Alert	400 $\mu\text{g m}^{-3}$ for 1 hour at 1 non-roadside site or 200 $\mu\text{g m}^{-3}$ for 3 days	Restrictions on fixed emissions Speed limits Restrictions on vehicles in transit Restrictions on certain classes of vehicle (even/odd plates) Free public transport Free parking outside urban area
Helsinki	Information	150 $\mu\text{g m}^{-3}$ for 3/6 hours at 2 stations	Information to public. Encourage public transport
	Traffic restriction	200 $\mu\text{g m}^{-3}$ for 3 hours for 2 days at 2 stations	Free public transport Restrictions on private cars
	Alert	400 $\mu\text{g m}^{-3}$ for 3 hours	Public alert
Czech Republic	Information	200 $\mu\text{g m}^{-3}$ for 3 hours	Information. Voluntary restrictions on private vehicles. Restrictions on fixed sources.
	Alert	400 $\mu\text{g m}^{-3}$ for 3 hours	Public alert
Hungary (e.g. Debrecen)	Information	350 $\mu\text{g m}^{-3}$ for 3 hours	Information
	Alert	400 $\mu\text{g m}^{-3}$ for 3 hours	Restrictions on fixed emissions sources Speed limits Restrictions on vehicles in transit Restrictions on certain classes of vehicle (even/odd plates) Free public transport Free parking outside urban area

5.5 Threshold levels for sulphur dioxide

Annex XII of Directive 2008/50/EC sets an alert threshold of $500 \mu\text{g m}^{-3}$ measured or predicted as an hourly mean to be exceeded for three consecutive hours. Article 24 of the Directive gives Member States the option to develop short term action plans where there is a risk that the limit value for sulphur dioxide will be exceeded. The limit value for sulphur dioxide is $350 \mu\text{g/m}^3$, as an hourly mean not to be exceeded more than 24 times a calendar year.

All of the short-term action plans relating to sulphur dioxide use the alert threshold as the trigger to initiate measures to reduce concentrations or human exposure. Some of the short-term action plans also introduce lower thresholds that trigger measures to reduce concentrations or exposure of members of the public. These actions are optional under Article 24 of the Directive. The thresholds adopted differ between countries and regions. Table 10 shows examples of the range of thresholds and the actions taken when they are exceeded. More detail on action plan measures is given in Section 5.11 and 5.12.

Table 10: Examples of thresholds and actions for sulphur dioxide

Region	Level	Threshold	Possible actions initiated
Tours	Vigilance	$200 \mu\text{g m}^{-3}$ for 1 hour at 3 sites	Inform responsible parties
	Information	$300 \mu\text{g m}^{-3}$ for 1 hour at 2 sites	Inform public Identify fixed sources
	Alert	$500 \mu\text{g m}^{-3}$ for 1 hour at 1 non-roadside site	Restrictions on fixed emissions
Czech Republic	Information	$200 \mu\text{g m}^{-3}$ for 3 hours	Information. Restrictions on fixed sources.
	Alert	$400 \mu\text{g m}^{-3}$ for 3 hours	Public alert
Hungary (e.g. Debrecen)	Information	$400 \mu\text{g m}^{-3}$ for 3 hours	Information
	Alert	$500 \mu\text{g m}^{-3}$ for 3 hours	Restrictions on fixed emissions sources Limit temperature in public buildings heated by solid fuel or oil

5.6 Threshold levels for PM₁₀

Annex XII of Directive 2008/50/EC does not set an alert threshold for particulate matter PM₁₀. However, Article 24 of the Directive gives Member States the option to develop short term action plans where there is a risk that the limit value for PM₁₀ will be exceeded. The limit value for PM₁₀ is $50 \mu\text{g m}^{-3}$, as a daily mean not to be exceeded more than 35 times a calendar year.

Short-term action plans for PM₁₀ introduce various thresholds that trigger measures to reduce concentrations or exposure of members of the public. These actions are optional under Article 24 of the Directive. The thresholds adopted differ between countries and regions. Table 11 shows examples of the range of thresholds and the actions taken when they are exceeded.

Table 11: Examples of thresholds and actions for particulate matter, PM₁₀

Region	Level	Threshold	Possible actions initiated
Brussels	Level 1	75 µg m ⁻³ as the daily mean on two consecutive days at two or more stations	Speed limits
	Level 2	100 µg m ⁻³ as the daily mean on two consecutive days at two or more stations	Limits on circulation for odd/even number plates Heavy duty vehicle restrictions Free public transport Restrictions on heating of public buildings
	Level 3	150 µg m ⁻³ as the daily mean on two consecutive days at two or more stations	More stringent restrictions on circulation
Tours	Information	80 µg m ⁻³ as a 24 hour running mean at 2 sites	Inform public
	Stronger information	125 µg m ⁻³ as a 24 hour running mean at 2 sites	Inform public
Helsinki	Particulate	50 µg m ⁻³ as a daily mean on the previous day and expected to continue	Information to public. Street cleaning Spray streets with calcium chloride solution to suppress dust Encourage residents to clean streets in front of their houses
Hungary (e.g. Debrecen)	Information	75 µg m ⁻³ for as a daily mean on two consecutive days	Information
	Alert	100 µg m ⁻³ for as a daily mean on two consecutive days	Restrictions on stationary emissions sources Limit temperature in public buildings heated by solid fuel or oil Limit construction activities

5.7 Termination of information or alert states

The Czech, Finnish and most of the French short term action plans require the authorities to notify the public and stop the measures to reduce emissions or exposure once the concentrations have fallen below the threshold concentrations. Some of the French short term action plans provide the clearest guidance on when to terminate the information or alert states. For example, the Chartres short term action plan specifies that the requirement to provide the public with information and recommendations ceases when the concentration remains below the information threshold for 48 hours or below the threshold of vigilance for more than 24 hours.

5.8 Delegation of responsibility

The short-term action plans are similar to emergency response plans in that it is important that all authorities have a clear statement of their responsibilities and that clear channels of communication exist between authorities. The French and Hungarian short term action plans provide in the main a clear statement of who is responsible for initiating and terminating the

information or alert response states. The best provide details of how information is cascaded to mobilise responsible parties after threshold concentrations are exceeded (for example Fig.5 in the Tours short term action plan). They also provide the clearest statements of the responsibilities of each of the authorities. Some of the French short term action plans (e.g. Blois, Chartres) provide “mission cards” for each of the authorities specifying their duties (for example, Fig.6 from Blois).

Fig. 5 : Information cascade and mobilisation diagram

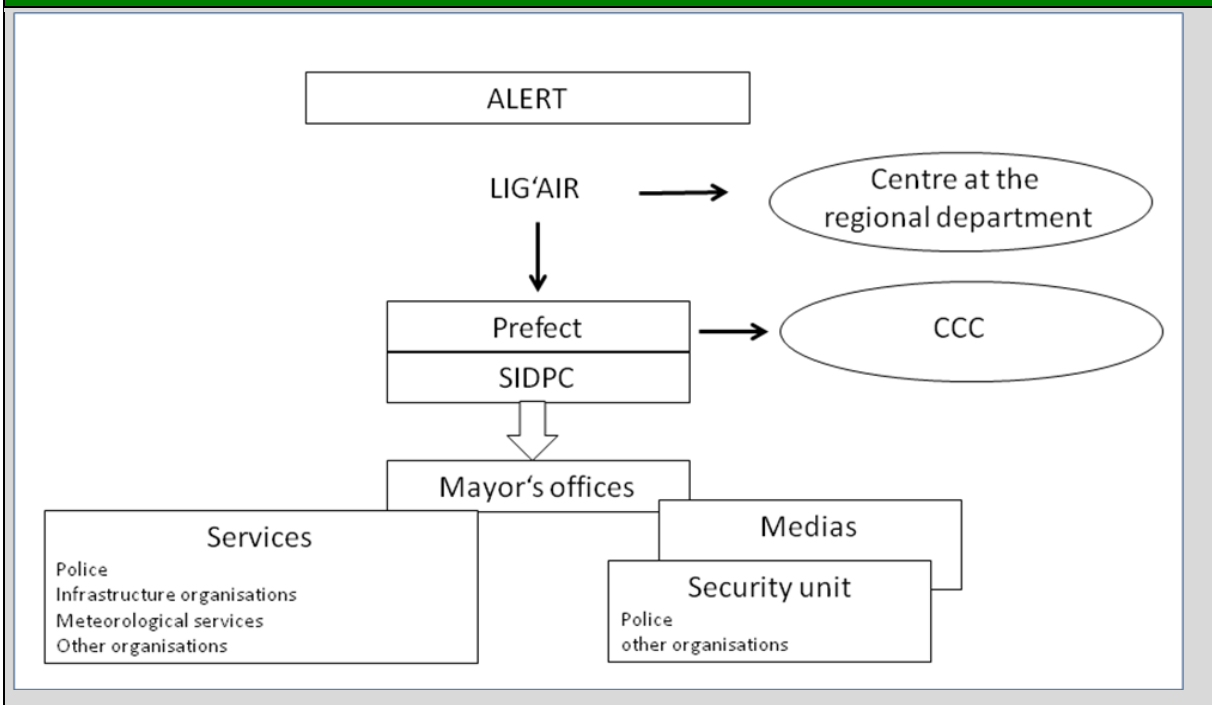


Fig. 6: Example of a mission card

Annex 4A: Mission card
Role of the Prefect

In case of exceedance of threshold of vigilance

→ Decides on putting services on alert.

In case of exceedance of recommendation threshold

→ Decides on launching information of the public.
→ Approves press releases.

In case of exceedance of alert threshold

→ Decides on launching the alert.
→ Approves press releases.
→ After consultation of the Regional Department for the Environment, decides on putting short-term measures in place for stationary sources.
→ After consultation of the Regional Department for the Environment, decides on putting short-term measures in place for mobile sources (speed limit for car traffic).
→ Decides on putting in place a communication unit and a public information unit.
→ Puts the deputy governor, cabinet head or other member of the governor's staff in place for heading the communication unit.

5.9 Informing the public

The short term action plans specify that the public is informed when the information or alert thresholds are exceeded or there is a risk that the thresholds are exceeded. The amount of detail provided by the short term action plans varies. In some cases, the short term action plan provides little guidance other than an instruction to provide information. On the other hand, some of the French short term action plans specify the contents of the message in some detail. For example, the short term action plan for the Chartres agglomeration provides prepared press communiqués (e.g. Fig. 7). The information and recommendations level communiqué states that the information threshold of $180 \mu\text{g m}^{-3}$ as an hourly mean for ozone has been exceeded. It summarises the concentrations attained at specified monitoring stations. It then states that the Prefect has initiated the information level response. The short term action plan provides complementary information for the public on the effects of ozone pollution (e.g. Fig. 8). It:

- Explains that ozone is produced by the action of the sun on pollutants emitted by road vehicles and industries
- States that the gas is harmful to human health and the environment.

- States that the observed concentration can provoke eye, nose and respiratory irritation for sensitive people (asthmatics and those suffering from respiratory or cardiac problems)
- Warns that intense physical activity increases the volume of air and ozone inhaled and thus risks bringing on important effects such as the diminution of respiratory capacity, and the aggravation of existing respiratory or cardiac conditions
- Recommends that sensitive people or people showing symptoms on this occasion avoid intense physical or sporting activities, apply strictly the treatments administered by their doctor, avoid the use of tobacco, solvents or other respiratory irritants, consult their doctor if they experience unusual respiratory symptoms

The short term action plan suggests various measures that members of the public might take to help reduce the high ozone concentrations. These include avoiding the use of personal cars, using public transport, walking, reducing vehicle speeds by 20 kph and reducing the use of paints and solvents.

It has to be noted that such information (exceedance of information threshold, possible health effects, recommendation, information on preventive action) is also required under Article 19 and Annex XVI of the Directive ("public information"). I.e. the short term action plan combines the requirements of informing the public in case of information/alert threshold exceedances with additional measures in case of alert threshold exceedances.

5.10 Protection of sensitive population groups

Paragraph 2 of Article 24 of the Directive Specific indicates that actions aiming at the protection of sensitive population groups, including children, may also be considered in the framework of short-term action plans. The actions identified in the action plans we have examined are limited to preventing the exposure of sensitive population groups. The most detailed advice is contained in some of the French action plans. For example, Table 12 shows the advice given in the La Manche region when the alert threshold for particulate matter is exceeded.

We are not aware of any short-term action plans that specifically include measures to reduce concentrations in the vicinity of locations where the most sensitive individuals are present (e.g schools, hospitals, care homes).

Table 12: Specific advice given to sensitive groups in the La Manche short-term action plan

Groups	Activities	Actions
Children less than 6 years old (crèches and nursery schools)	Regular travel	Do not change necessary travel arrangements but avoid walks
	Recreation or equivalent	Avoid outsider activities
Children between 6 and 15 years old (schools, colleges and day camps)	Regular travel	Do not change normal travel arrangements
	Recreation or equivalent, not involving organised sports	Avoid outside activities
	Sporting activities	Avoid outdoor sports and focus on low or medium intensity physical exercise. NB: a medium intensity exercise does not require breathing through the mouth
	Sporting competitions	Report all interior or external competitions
Adults and adolescents	Travel	Do not change travel plans
	Sporting activities	Avoid high intensity and endurance sports outside. Favour inside sporting activities for people known to be sensitive or that show symptoms on this occasion. Adapt or modify activities.
	Sporting competitions	Move the competition if possible. NB: It is for individual athletes to judge the appropriateness of their participation in the competition, based on their experience and advice from their doctor

Fig. 7: Example of a press communique

Republic of France
 PREFECTURE of EURE-ET-LOIR
 INTER-MINISTRY SERVICE OF DEFENCE AND CIVIL PROTECTION
 Phone: 02.37.27.72.00 / Fax: 02.37.27.70.44

ATMOSPHERIC POLLUTION
TRIGGERING OF THE INFORMATION AND RECOMMENDATIONS THRESHOLD
 For the agglomeration of Chartres

Date:

To: Sub-prefectures, the General Council, DDE, DDSP, National Gendarmerie, mayor’s offices of Champhol, Chartres, Le Coudray, Lèves, Luce, Glossy, Mainvilliers, COMACH, DDJS, EMS, CTA / CODIS, IA, DRIRE, DDASS, LIG’AIR association, local media.

There is currently a high concentration of ozone recorded in the agglomeration of Chartres.

The information threshold set at 180 micrograms per m³ of air, averaged over one hour, has been exceeded.

Hourly concentrations reached __ micrograms per m³ of air at the site Fulbert in Chartres and __ micrograms per m³ of air at the site of Lucé.

Based on these measurements by the association LIG’AIR, the Prefect of Eure-et-Loir triggered the information and recommendations level for emergency measures in case of atmospheric pollution

Pollutants	Level 1 Threshold of vigilance	Level 2 Information and recommendation threshold	Level 3 Alert threshold
Ozone	150	180	<u>Alert 1:</u> 240 (1 h average over 3 hours) <u>Alert 2:</u> 300 (1 h average over 3 hours) <u>Alert 1:</u> 360 (1 h)

Unit: µg/m³ as hourly average

Please find enclosed a statement of possible risks arising from this event as well as behavioral advice to the public.

Fig. 8: Example of advice provided to members of the public

ADDITIONAL INFORMATION FOR THE PUBLIC ON THE EFFECTS OF AIR POLLUTION BY OZONE

Ozone air pollution
- Information and recommendation level –

Near the ground, this gas is produced by the effect of sunlight on pollutants emitted by automobiles and industries. It is harmful to humans and the environment.

The observed concentration may cause eye irritation, nasal and respiratory in sensitive individuals (asthma, respiratory or cardiac illnesses) or may evoke such an individual susceptibility at this occasion.

Intense physical effort (such as running) increases the volume of air and ozone inhaled and is therefore likely to cause more significant effects (pain on deep inspiration, decreased respiratory capacity, aggravation of existing respiratory or cardiac disease).

It is therefore recommended for sensitive people or those who are affected on this occasion:

- To avoid any intense physical activities and sports. Heads of childcare facilities should defer physical activity and sports of sensitive individuals. These recommendations do not prohibit going outside..
- To adhere strictly to the treatments offered by their doctor.
- Avoid smoking, solvents or other respiratory irritants.
- Consult a doctor if unusual breathing difficulty appears.

The current situation does not require special measures of containment. Therefore the usual practice of aeration and ventilation of living and working premises should not be changed.

To reduce this high concentration of ozone, it is recommended:

- To avoid using your motor vehicle.
- In the urban area, use public transportation or carpooling or walking. Outside urban areas, drivers are advised to reduce their vehicle speed by 20 km / h in order to reduce exhaust emissions.
- To reduce the professional and home use of solvents and paints. Gases emitted by these compounds promote the formation of ozone.

More information is available at www.ligair.fr

5.11 Measures to control traffic emissions

Table 13 lists measures to control traffic emissions identified in the responses to our questionnaires. The measures are not in general applied throughout the whole country but may be applied selectively in specific areas. Local or regional authorities may have the power to apply these measures: however, implementation of these measures is at the discretion of the authorities. Some measures were found in the air quality plan rather than in the questionnaire returns.

Table 13: Measures to control traffic emissions

Country	Measures	Measures in air quality plan
Austria	Speed limit of 100 km/h on sections of motorways (instead of 130 km/h), depending on current NO ₂ or PM ₁₀ concentrations and other factors.	Air quality plans
Belgium	Speed limits. Restrictions on heavy duty vehicles. Restrictions on vehicles with odd or even number plates	
Czech Republic	Free public transport. Road cleaning	Air quality plan
Finland	Restrictions on private vehicle use	
France	Speed limits. Limits on heavy duty vehicle through traffic. Restrictions on vehicles with odd or even number plates. Free public transport. Provision of parking for excluded vehicles.	
Hungary	Speed limits. Limits on heavy duty vehicle through traffic. Restrictions on vehicles with odd or even number plates. Free public transport. Provision of parking for excluded vehicles.	
Italy	Restrictions of vehicles EURO 0, EURO 1, 2-stroke motorbikes and all diesel-vehicles without particle filter	
Sweden	Road cleaning and suppression of dust with calcium chloride solution	Air quality Plan

In practice, the effective implementation of measures to control traffic requires precise definition of the area of application, the types of vehicles and when the restrictions apply. Fig. 9 a), b), c), d) provides a precise description of the measures that can be implemented in Chartres. It provides a clear description of where the measures will apply and includes a map of the area. It provides a clear description of how the odd/even number plate restrictions will work. It identifies the types of vehicles for which a derogation will apply. It provides details of when the decision to implement the measure must be made and when the public will be informed. It provides a clear statement of when the measures will apply.

The short term action plan specifies in detail:

- The sections of road where the measures can be applied
- The sections of roads where the measures will not be applied
- The periods of the day that the measures can be applied
- The class of vehicles to which the restrictions apply
- The classes of vehicles and types of journey that are exempt from the restrictions

Fig. 9a: Example of the specification of the measures that can be taken

<p>MEASURES TO BE TAKEN IN CASE OF OZONE OR NITROGEN DIOXIDE ALERT</p>
<p>Measure 1 - Deviation of transit trucks</p> <p>Trucks in transit from all directions are not allowed to enter the perimeter bounded by roads RN123, RD905, RN1154 RN154 and municipal boundaries of Lèves and Champhol according to the map enclosed (Annex IV). They have to take the axes defining the perimeter.</p> <p>Measure 2 - Limiting vehicle speeds</p> <p>Within that Perimeter (Annex IV), vehicle speed is limited to 50 km / h (except on roads already limited to 30 km / h)</p> <p>On the delimiting roads, i.e. RN123, RN1154, RN154 and RD905, the speed limit is 70 km/h.</p> <p>Measure 3 – Re-enforcing speed controls and pollution controls on public roads</p> <p>Speed controls and pollution controls carried out on the street by security forces are strengthened within the scope defined above (Appendix IV).</p> <p>Measure 4 - Implementation of alternating traffic</p> <p><u>Implementation</u></p> <p>Within the area defined above (Appendix IV), the movement of motor vehicles, regardless of the category, is regulated as follows:</p> <ul style="list-style-type: none"> - Vehicles with an odd license plate number may circulate only on odd calendar days. - Vehicles with an even license plate number may circulate only on even calendar days (numbers ending with a zero are considered even). <p><u>Procedural Requirements</u></p> <p>The measure of alternating traffic does not apply to the roads delimiting the area defined above (Appendix IV).</p> <p>The provisions relating to the establishment of alternating traffic applies to vehicles registered in France in the normal series, the series TT and IT, vehicles registered in W and WW and vehicles registered in special zones (like the departments of Ain and Haute Savoie).</p> <p>For government vehicles, the number to be considered on the plate is the group of four numbers characterizing the registration series.</p> <p><u>Derogations</u></p> <p>Notwithstanding the measure of alternate circulation, operation of the following registered motor vehicles is allowed:</p> <ul style="list-style-type: none"> - Cars and light duty vehicles identified by the green sticker issued pursuant to Article R. 131 of the Highway Code, - Passenger cars without green sticker but carrying at least 3 passengers - Passenger cars and light duty vehicles with foreign license plates - Motorcycles,

Fig. 9b: Example of the specification of the measures that can be taken (continued)

- Tricycles and quadricycles,
- Mopeds,
- Commercial vehicles other than trucks,
- public transport vehicles
- Police vehicles
- Fire brigade and emergency vehicles
- S.A.M.U. and S.M.U.R. intervention vehicles
- Public and private ambulances,
- Emergency response vehicles providing a public service (civil security, mine clearance services, customs DDEEDF-GDF, S, NCF ..)
- Vehicles of D.R.I.R.E.,
- Vehicles of LIG'AIR taking measurement,
- Vehicles of medical and paramedical professions,
- Medical vehicles and taxis,
- The funeral transport vehicles,
- Vehicles carrying the badge G.I.C. or G.I.G.,
- Municipal police cars,
- Post office vehicles,
- Military vehicles,
- Vehicles of refuse collection and street cleaning,
- Delivery vehicles of pharmaceuticals and medical oxygen,
- Money transport vehicles,
- towing services

In addition, registered motor vehicles providing delivery services are allowed until 10am.

Accompanying measures

Free access to public transport networks

The provisions of Article L.223-2 of the Code of Environment relating to free public transport applies within the boundaries of alternate traffic and concerns the regular lines of FILIBUS and the train line Chartres - Luce.

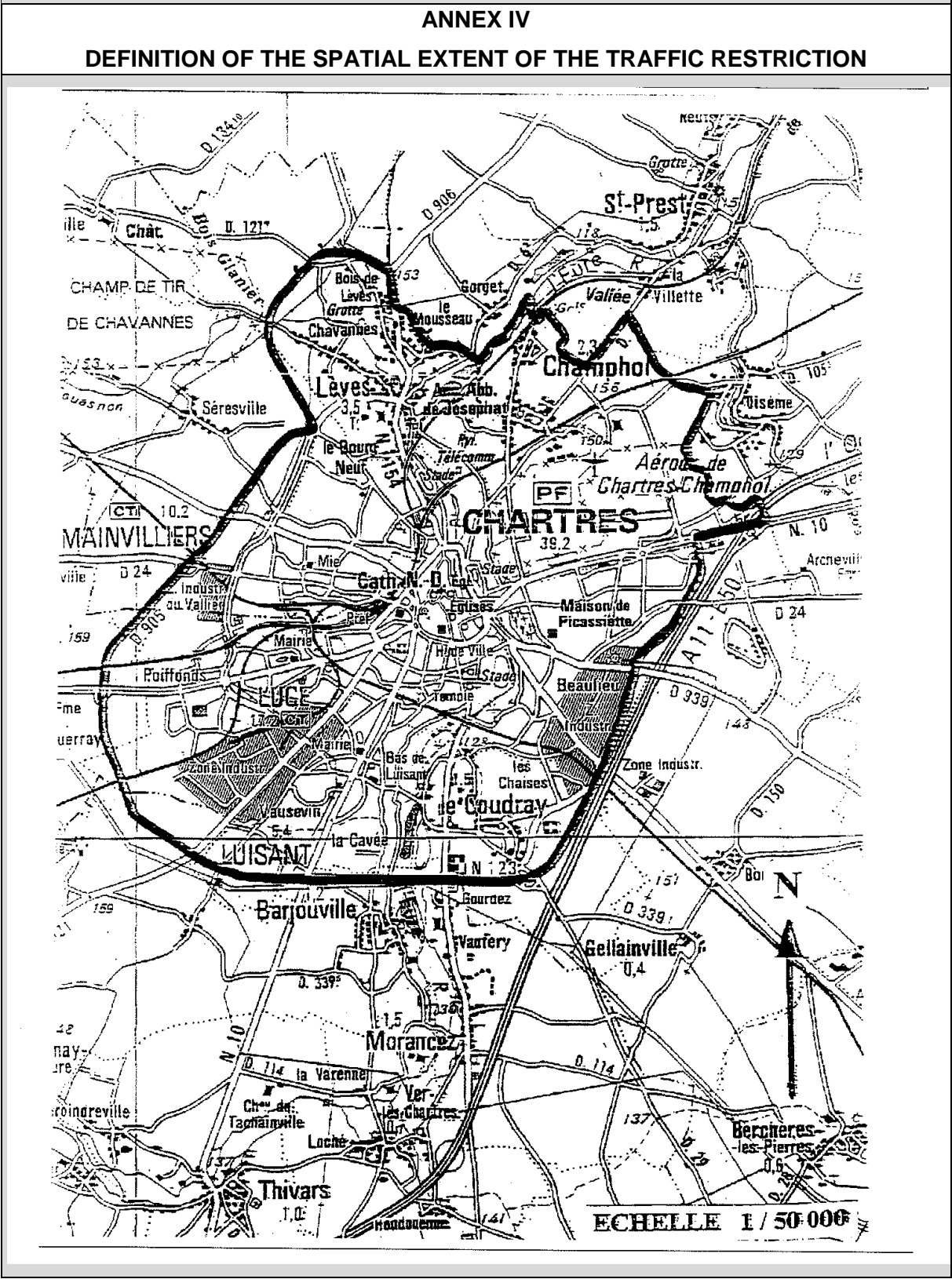
Parking of vehicles

The competent authorities may take all measures to allow parking of vehicles to get inside the perimeter (such as the establishment of park and ride devices connected to downtown by public transport), and reduce the volume of traffic within the area by encouraging residents not to use their vehicles and discouraging non-residents to park.

Fig. 9c: Example of the specification of the measures that can be taken (continued)

CONDITIONS OF IMPLEMENTATION
<p>Triggering of measures</p> <p>For the application of traffic restriction measures, the alert threshold is considered likely to be reached when there is a high probability to reach it the next day.</p> <p>The decision to implement the measures mentioned above is taken and made public no later than 7 pm to take effect the next day at 5 am.</p> <p>Period for the alternating traffic measure</p> <p>When the measure of alternating traffic is triggered, its implementation is effective the next day from 5 am until midnight.</p> <p>It may be renewed under the same conditions.</p> <p>Information of authorities and the public</p> <p>The decision to implement the measure is immediately brought to the attention of the authorities concerned.</p> <p>In case of implementation of the measure, prior information of the public is done by a press release sent by the Prefect's office to local newspapers, local radio stations and the regional television station, not later than 7 pm on the day before implementation of measures, in order to allow circulation of the information as soon as possible.</p> <p>This information is also relayed by local governments, as well as by municipalities using their message boards.</p>

Fig. 9d: Example of a map used to specify the perimeter of the area of restrictions on traffic



5.12 Other measures

Table 14 lists measures to control emissions from other sources identified in the responses to our questionnaires. The measures are not in general applied throughout the whole country but may be applied selectively in specific areas. Local or regional authorities may have the power to apply these measures: however, implementation of these measures is at the discretion of the authorities.

Table 14: Non-traffic measures in short-term action plans

Country	Measures	Measures in air quality plan
Belgium	Restrictions on emissions from large stationary sources Reduce temperature in public buildings	
Czech Republic	Reduce emissions of dust from industrial activities. Cleaning of roads. Water suppression of construction activities	Yes
Finland	Voluntary restrictions on wood burning	
France	Restrictions on industrial emissions	
Hungary	Restrictions on construction activities Restrictions on industrial emissions Voluntary restrictions on heating	
Italy	Restrictions on heating and wood burning Restrictions on industrial emissions	

5.13 Reporting

Several of the French short term action plans require that a report on each pollution event is prepared within a fixed time following the event. For example, the short term action plan for Blois requires that a report is prepared daily as part of an alert level response. The report should give details of:

- The maximum concentrations achieved (date, time, station)
- Comparison with the information and alert thresholds
- Indications of the concentrations of other pollutants
- The area affected
- Comparison with past concentration levels (maximum in the year, maximum historic)
- Forecast evolution of the pollution event
- Effects of civic recommendations
- Descriptions of the event (origin, meteorological conditions)
- Effects on health

5.14 Evaluation of effects of measures

Few, if any, of the SAPs refer to studies undertaken to evaluate the potential effect of the measures they contain. Table 15 provides a summary taken from the responses to the question asked in our questionnaire *“How did you predict the likely impact of your short-term action plan on pollutant concentrations? Please provide information about your emission source apportionment analysis and respective spatial references, and how this is related to the choice of the measures”*. In general, the responses indicate that local measures to control emissions have the greatest effect of PM₁₀ and nitrogen dioxide but have little effect on ozone.

Table 15: Summary of methods used to evaluate the effectiveness of action plans

Country /Region	Evaluation of measures
Austria	For ozone source apportionment by MM5/CAMx modelling as well as emission scenario based modelling of ozone concentrations in the relevant zone; see http://www.wien.gv.at/umweltschutz/pool/luft.html#ozon (in German language)
Belgium	During particulate matter smog episodes a speed limit from 120 to 90 km/h is introduced on some highways in the three Belgian regions. The effect of this measure on the concentrations of Elementary Carbon (EC) and total mass particulate matter (PM ₁₀ and PM _{2.5}) was calculated using a chain of different models. The results are published in Atmospheric Environment : Lefebvre et al, “Modeling the effects of a speed limit reduction on traffic-related elemental carbon (EC) concentrations and population exposure to EC”, 2010 : http://www.sciencedirect.com/science/article/pii/S1352231010008010
Czech Republic	Based on the maps of PM ₁₀ annual average concentrations and PM ₁₀ daily limit value exceedance number, probability of smog alert thresholds violation is estimated by the statistical approach in regular 1x1 km network over the whole Czech republic territory. Regions-in-risk where operation of smog warning system might be meaningful were marked using these maps. In the next step, particle pollution sources located in these regions or their near surrounding were selected from the emission database. Using a simplified Gaussian dispersion model, a contribution of selected sources to the PM ₁₀ concentration level in potential smog regions was estimated. Sources with the significant contribution to the human exposure to PM ₁₀ in their vicinity were put into group of sources obliged to apply regulation measures during the smog episodes.
Finland	In cases of sudden increases of PM ₁₀ the Environment Centre may require the city street maintenance personnel to spray the streets with calcium chloride in order to reduce re-suspension of PM ₁₀ from the road surfaces. The expected impacts have not been accurately quantified but several studies have shown that dust binding is the most effective means to reduce acute high concentrations of PM ₁₀ . In extreme situations of elevated NO ₂ levels caused by traffic emissions the Mayor of Helsinki may restrict the use of private passenger motor vehicles in the area. The measure has not been put to use as the action threshold has not been exceeded. The expected impacts of such a restriction have not been accurately quantified. As traffic emissions are the main source of NO ₂ in Helsinki, a reduction in traffic volumes is expected to reduce the concentration of NO ₂ in ambient air. This has also been proved by dispersion modelling by HSY, which was carried out recently when preparing the time extension application for the NO ₂ limit value.
France-Centre	If episode of ozone pollution, it appears that the introduction of speed limits does not present additional efficiency. Given the extent of affected areas should be put in place measures on a large spatial scale.
France-Alsace	Evaluation of measures in the report “Rapport relatif a l’évaluation des mesures d’urgence potentiellement mises en oeuvre en Alsace pour limiter les pics de pollution atmospherique”. Measures were moderately effective for NO ₂ and PM ₁₀ but local measures were not effective for ozone.
France Base Normandy	In BN, very few triggers emergency measures to date and therefore not implemented measures to reduce planned not to assess the likely impact of emergency measures.
France Brittany	Brittany does not
France Ile de France	No impact prediction
France Limousin	No impact prediction
France Provence Alpes Cote	No analysis, see the study ozone (reducing speed has very little impact on pollution peak). http://www.paca.developpement-durable.gouv.fr/IMG/pdf/rapport_etude_ozone_cle014deb.pdf

Country /Region	Evaluation of measures
d'Azur	
France Rhone Alpes	Modelling studies showed that the effectiveness of reducing speed 20 km / h was much greater if carried out on the entire region rather than the big cities only (reduction emission of nitrogen oxides 10 times higher).
Hungary	There is a possible list of measures (from air pollutant to air pollutant to be applied in smog situations) in the annex 3 point B to <u>Governmental Decree No. 306/2010. (XII. 23.)</u> on the protection of ambient air. Choice of measures should be decided on the spot, for individual situations. Source appointments should be prepared locally, details can be found in relevant questionnaires.
Italy Bolzano	Regarding the emission inventory the traffic sector is one of the main sources of PM ₁₀ . See http://www.provinz.bz.it/umweltagentur/luft/luftqualitaetsplan.asp?&somepubl_action=300&somepubl_image_id=197192
Italy Toscana	The information on emission source apportionment are made on the Regional Sources Emission Inventory IRSE. The estimate of the effectiveness of plans is made on emissions saved in the urban area of interest. The choice of measures is made based on the relative importance of various activities that produce emissions.
Poland Slaskie	The main source of pollution emission is the emission from individual housing furnaces. Spot and line emission (industry and transport respectively) influences the poor air quality to much smaller extent.
Spain Catalunya	Not quantified
Sweden Gothenburg	The expected impact is based on several investigations concerning the effect of binding the PM ₁₀ to the street surface.
Sweden Jonkoping	We do not have a short-term action plan, but our general action plan contains measures that can be considered as short-term actions. Dust-binding is carried out in order to keep road surfaces damp and bind particulate matter to the surface, preventing it from being suspended in the air. Evidence from trials and other municipalities within Sweden shows that dust-binding gives an effect. Temporary speed reductions have also been shown to have a positive effect on particulate matter concentrations. The effect of a reduction from 50 km/h to 40 km/h has been estimated to give 10-15% reduction in concentrations. There is however some degree of uncertainty to this estimation.
Sweden Norrkoping	Peak concentrations of PM ₁₀ in spring is caused by suspension of road dust. Dust-binding through the spreading of CMA is therefore carried out to reduce suspension. This measure was chosen following evaluation studies on dust-binding in Norrköping and in other cities.
Sweden Stockholm	Based on the continuous monitoring of air pollution in Stockholm it is stated the local traffic is the major source for NO ₂ and PM ₁₀ during periods with high concentrations. http://slb.nu/slb/rapporter/pdf8/slb2011_001.pdf The short term actions are therefore taken against the emission from the traffic.

5.15 Frequency of implementation

The questionnaire responses provided information on the number of times that short-term action plans have been implemented during the last five years. Table 16 provides a summary of the questionnaire responses.

Short-term action plans have most frequently been implemented when particulate matter, PM₁₀ concentrations have exceeded information or alert levels. These information and alert levels are set by national or regional authorities and are not specified in Directive 2008/50/EC. The levels for PM₁₀ are set in order to minimise the number of exceedances of the daily limit value for PM₁₀.

The questionnaire responses indicated that countries with short-term action plans where the information threshold for ozone had been exceeded included Belgium, France, Spain and Hungary: the alert threshold had been exceeded in Belgium and Spain. The short term actions implemented following the exceedance of these thresholds did not go significantly beyond the requirements of Article 19 of the Directive 2008/50/EC, which requires the authorities to inform the public by means of radio, television, newspapers or the Internet and to forward information to the Commission.

The questionnaire responses indicated that information thresholds for nitrogen dioxide had been exceeded in France. The alert threshold set in Directive 2008/50/EC was not exceeded. The information levels are set by national or regional authorities and are not specified in Directive 2008/50/EC. The information levels for nitrogen dioxide set in France provide the trigger to inform the public and other responsible organizations.

Only Castilla la Mancha, Spain reported an exceedance (one exceedance) of the alert threshold for sulphur dioxide in the questionnaire response. The action plan requires the authorities to inform the public and large industrial installations when the alert threshold is exceeded. The industrial facilities are then required to implement a local protocol to reduce emissions. Note that Article 3 of the Integrated Pollution Prevention and Control Directive (2008/1/EC) requires that Member States take the necessary measures to provide that the competent authorities ensure that installations are operated in such a way that no significant pollution is caused.

Table 16: Summary of questionnaire responses relating to frequency of implementation of short-term action plans

Member State/ Region	Frequency of implementation
Belgium	<p>1. Ozone When there is a risk that the ozone information/alert threshold will be exceeded, the general public is informed or alerted. The number of warning/alert messages highly depends on the meteorological conditions during the summer period. The number of warning messages that were sent the last 5 years are : 2006 : 20 (3 including an alert) 2007 : 2 2008 : 5 2009 : 7 2010 : 13 (3 including an alert) Short-term actions during ozone smog episodes do not include emission reduction measures, but are focusing on informing/alerting for the effects of enhanced ozone concentrations on human health.</p> <p>2. Particulate matter Since 2006 and till 1/1/2011, the particulate matter smog alert (including speed limits) was activated 7 times 2006 : 0 2007 : 2 2008 : 3 2009 : 1 2010 : 1 Besides alerting the Belgian population about the health effect of particulate matter air pollution, also emission reduction measures are introduced (more info, see question 3)</p>
Czech Republic	Always when the alert threshold is exceeded. Nowadays it is only because of the exceedance of PM ₁₀ alert threshold, which happened since the setting of this threshold in November 2009 19 times. The last time the NO ₂ and SO ₂ alert threshold was exceeded was in winter 1996/1997.
Finland	<p>The section of the new plan pertaining to PM₁₀ has been initiated during the spring time dust episodes in spring 2010 and 2011. The Environment Centre requested the city street maintenance personnel to spray the streets with calcium chloride in order to reduce street dust on three occasions (14.4.2010, 12.4.2011 and 26.4.2011). The same measures were also included in the previous plan and they have been carried out over several years during the spring dust period, which occur regularly.</p> <p>The section of the new plan pertaining to PM_{2.5} was initiated in summer 2010, when HSY informed the public and the authorities of the sudden deterioration of air quality due to long-range transportation of fine particles from forest fires across the eastern border of Finland.</p>
France Aquitaine	Not activated
France Centre	15 ozone episodes from 2005 to date for exceeding the information threshold 4 PM 10 episodes for exceeding the information threshold of 80 µg m ⁻³ (value prior to the date fixed by the decree of October 21, 2010).
France Alsace	2 times (2007 and 2009) for particulate matter and in situations with a very calm atmospheric temperature inversion and a period of intense cold (accumulated wood burning and traffic).
France Bas Normandie	Not activated
France Bretagne	Trigger level "information and recommendations" for over-threshold NO _x and particulates.

Member State/ Region	Frequency of implementation
France Ile de France	In the period 2006-2010 6 exceedances of information threshold for NO ₂ 16 exceedances of information threshold for O ₃ 10 exceedances of information threshold for PM ₁₀ 1 exceedances of alert threshold for PM ₁₀
France Limousin	No response
France Martinique	15 exceedances of alert threshold for PM ₁₀ since 2003
France Rhone Alpes	Alert threshold for PM ₁₀ exceeded 23 times in 2011
Hungary	Action plan has been implemented for PM ₁₀ . Information threshold exceeded for ozone
Italy Bolzano	PM ₁₀ short-term action plan initiated 2 times in the municipality MERAN 10 times in the municipality BOZEN All this situation were caused by the stability of the atmosphere (inversions)
Italy Toscano	PM ₁₀ action plans initiated 3-4 times per year in 14 municipalities including the agglomeration of Florence (8 municipalities).
Spain Castilla la Mancha	<p><u>Alert threshold SO₂</u> 2010, once in Campo de Fútbol, with a duration of 3 hours.</p> <p><u>Alert threshold O₃ (total Castilla-La Mancha)</u> 2010, 5 hours 2009, 6 hours 2007, 2 hours 2006, 3 hours</p> <p><u>Information threshold O₃ (total Castilla-La Mancha)</u> 2010, 76 hours 2009, 40 hours 2008, 17 hours 2007, 14 hours 2006, 32 hours</p>
Sweden Gothenberg	Dust binding applied in 2011 about 17 times during February to April.
Sweden Jonkoping	Dust binding measures not applied
Sweden Norrkoping	Dust binding measures applied
Sweden Stockholm	Dust binding measures applied

6 Example of good practice

Effective plans for the implementation of short-term measures to control pollution have been developed in several countries. Some of the clearest and most robust plans have been developed in France. Table 17 lists the contents good plan to implement short-term actions to control emissions and exposure during pollution episodes. The contents are based on the short-term action plan for Tours, France. Table 18 provides a summary of the contents of each section of the action plan. Appendix 4 contains

The development of air quality action plans in general follows a process involving the:

- Assessment of air quality
- Identification of options to reduce emissions or exposure of members of the public
- Evaluation of options in terms of:
 - The expected improvement in air quality delivered by the alternative measures or combinations of measures
 - Feasibility
 - Public, political, commercial perceptions
 - Non Air Quality Impacts – for example socio-economic impacts, climate change, noise, local transport plans
 - Cost effectiveness including the cost to other parties, for example to other agencies, to the public, to commercial operations etc.
 - Timescale for implementation

As best practice, we consider that the short term action plan should provide evidence that the authority has undertaken this process. This would be consistent with the requirements of Annex XV of the Directive which specifies the requirements for Air Quality Plans. We have not been able to identify examples of short-term action plans that set out details of the development process.

Table 17: Contents of a good short-term action plan

Contents of the short –term action plan	Summary of the contents
0 LEGAL INSTRUMENT TO IMPLEMENT THE SHORT-TERM ACTION PLAN	Provides a copy of the legal instrument that allows the authorities to implement the short-term action plan
I GENERAL MEASURES FOR ATMOSPHERIC POLLUTION	
A General provisions	
A1- Description of the general approach to the control of short-term pollution events	Explains how exceedance of the information and alert thresholds initiates specific actions
A2- Implementation circumstances	Explains in general terms the types of action triggered as the result of exceedance of the information and alert thresholds
A3 Organisation of the air quality monitoring network	Provides information on the location of monitoring stations used to initiate short-term actions
A4 Perimeter of application of the measures	Describes where the measures will be applied
B Threshold levels for implementation	Sets out the information and alert thresholds for relevant pollutants
C Identification of fixed sources	Refers to the air quality plan (PPA) to identify fixed emission sources. Provides a summary of measures that can be taken to limit emissions from industrial sources, including specific abatement orders
D Conditions for return to normal	Provides details of the air quality conditions required to return to normal after a pollution episode
E Report on the pollution episode	Specifies the requirement for relevant organisation to provide a report on the pollution episode within a specified time
F Mobilisation scheme for services	Specifies how information is cascaded to mobilise relevant organisations in the event of a pollution episode. See Fig. 4
G Mission cards for responsible bodies	Provide detailed instructions for each party. For example, see Fig. 5

Contents of the short –term action plan	Summary of the contents
II SPECIFIC MEASURES FOR ATMOSPHERIC POLLUTION: THE EMERGENCY TRAFFIC PLAN	
A General approach	Explains that various traffic control measures can be implemented as part of a graduated response following exceedance of concentration thresholds.
B List of communities affected by the emergency traffic plan	Lists the areas affected by the emergency traffic plan. Also provides a map (See Fig. 8d)
C Principal measures implemented according to pollutant and threshold level	Provides details of the measures taken as the result of the concentration thresholds. The information includes details of the roads affected , the types of vehicles for which restrictions apply and any derogations, and the period for which the restrictions apply
D Mission cards for responsible bodies	Provide detailed instructions for each party.
III ANNEXES	
Annex 1 : Legal instrument giving power to introduce temporary traffic control measures	Provides a copy of the legal instrument that allows the authorities to implement the restrictions on traffic
Annex 2: Messages to the population	Provides draft press communiqués and further pollutant-specific advice to the public on how to avoid exposure. See Fig. 6 and Fig. 7

7 Lessons learnt: recommendations

7.1 Introduction

This section of the report provides a summary of the lessons learnt as the result of our review of short-term action plans. We provide recommendations based on the lessons learnt.

7.2 Reporting of exceedances

Member States report exceedances of the information and alert thresholds for ozone in Forms 13a and 13b of the questionnaires according to Decision 2004/461/EC for ozone. It is thus relatively straightforward to identify where these exceedances have occurred and thus to establish where short-term action plans might be required.

The questionnaires prepared according to Decision 2004/461/EC do not require Member States to report exceedances of the alert thresholds for sulphur dioxide or nitrogen dioxide. Identification of exceedances of the alert thresholds for these pollutants across the European Union requires the examination of data from many monitoring sites.

Implementing Decision 2011/850/EC will be implemented from 1 January 2014. It will replace the provisions of Decision 2004/461/EC and requires Member States to report exceedances of the alert thresholds for nitrogen dioxide and sulphur dioxide.

We recommend that Member States report exceedances of the alert thresholds for nitrogen dioxide and sulphur dioxide in the interim period, in order to provide further evidence of the frequency of exceedance.

7.3 Spatial exceedance of alert thresholds for sulphur dioxide and nitrogen dioxide

Short-term action plans are required under the Directive where, in a given zone or agglomeration, there is a risk that the levels of pollutants will exceed one or more of the alert thresholds. The CAFE working group on Implementation produced a note Nr 2003/1 "Necessity to prepare action plans to reduce the duration of exceedances of alert thresholds (Art 7(3), 96/62/EC)". The note describes a method to establish whether there is a risk that exceedances of the alert thresholds for sulphur dioxide and nitrogen dioxide extend over areas exceeding 100 km² (or cover a whole zone). The method has only been applied approximately in this study because of the large numbers of monitoring stations involved.

We recommend that Member States, themselves should identify in their questionnaires where exceedances of the alert thresholds for sulphur dioxide and nitrogen dioxide do not extend over areas exceeding 100 km² (or cover a whole zone).

7.4 Alert threshold for nitrogen dioxide

The alert threshold for nitrogen dioxide has been exceeded at monitoring sites on very few occasions in the period 2005-2009. Most of the exceedances occurred in Romania and Bulgaria before accession to the EU.

We recommend that the Commission considers whether there remains a need for an alert threshold for nitrogen dioxide, and if so whether the current threshold is appropriate.

7.5 Alert threshold for sulphur dioxide

The alert threshold for sulphur dioxide has been exceeded most frequently near to industrial installations. Generally, these exceedances have been limited to a single monitor or group of nearby monitors so that the exceedance may not be representative of a wider area. Relatively few of these exceedances occurred in the last year of the data (2009): this may be related to the increasing effectiveness of the IPPC Directive (96/61/EC as amended most recently, 2008/1/EC). It is anticipated that the Industrial Emissions Directive (2010/75/EC) will reduce the number of exceedances further.

The alert threshold was exceeded at some urban background sites in Bulgaria and Romania. Measures to reduce sulphur dioxide emissions since accession in 2007 in these countries may lead to a reduction in the exceedances of the alert threshold.

We recommend that Member States review their most recent monitoring data for sulphur dioxide to establish whether the alert threshold has been exceeded since 2009. We recommend that the Commission then considers whether there remains a need for an alert threshold for sulphur dioxide, and if so whether the current threshold is appropriate.

7.6 Alert threshold for ozone

The alert threshold was exceeded in several Member States, most frequently in Italy.

We recommend that the alert threshold for ozone remains at the current level specified in the Air Quality Directive.

7.7 Particulate matter, PM₁₀

Many of the short-term action plans include actions to be taken when particulate matter, PM₁₀ concentrations exceed certain threshold levels for a specified period of time. These are the most frequently implemented short-term action plans. However, there is substantial variation in the threshold levels specified in different countries.

We recommend that the Commission considers whether it would be appropriate to include short-term action plans for PM₁₀ within the scope of the Air Quality Directive and if so to consider the most appropriate threshold levels.

7.8 Good examples of short-term action plans

Effective plans for the implementation of short-term measures to control pollution have been developed in several countries. Some of the clearest and most robust plans have been developed in France. The plans variously address nitrogen dioxide, sulphur dioxide, ozone and particulate matter, PM₁₀. The plans have a clear link to relevant legislation and they provide clear guidance on:

- the responsibilities of each of the authorities,
- the actions that will be taken when information and alert thresholds are exceeded or exceedances are forecast,
- the criteria used to initiate and terminate the action plan operation
- the geographical extent of the action plan measures

- the purpose of the measures taken as part of the action plan

We recommend that some of the short term action plans from France, e.g. from Tours, are promoted as good examples.

7.9 Frequency of implementation

The questionnaire responses indicated that short-term action plans have rarely been implemented as the result of exceedances of the alert thresholds for nitrogen dioxide, sulphur dioxide or ozone. In most cases, the actions implemented following the exceedance of these thresholds did not go significantly beyond the requirements of Article 19 of the Directive 2008/50/EC, which requires the authorities to inform the public by means of radio, television, newspapers or the Internet and to forward information to the Commission. It is not clear that the Directive requirement to prepare short-term action plans for nitrogen dioxide, sulphur dioxide and ozone has resulted in any improvement in air quality or reduction in public exposure.

We recommend that the Commission considers how Article 24 of the Air Quality Directive might be revised so that it provides more effective means of improving air quality and reducing public exposure.

Appendices

Appendix 1: Questionnaire on short-term action plans

Appendix 2: Analysis of Airbase data for nitrogen dioxide

Appendix 3: Analysis of Airbase data for sulphur dioxide

Appendix 4: Analysis of questionnaire 2004/461/EC data for ozone

Appendix 1 - Questionnaire on short-term action plans

Annex

Information on the questionnaire on short-term action plans

The Ambient Air Quality Directive 2008/50/EC requires Member States to prepare, publish and regularly monitor short-term action plans to reduce concentration levels where there is a risk of exceedance of the air quality alert thresholds³. As regards ozone, such a short-term action plan should only be drawn up when in the Member States opinion there is significant potential, taking into account national geographical, meteorological and economic conditions, to reduce the risk, duration or severity of an exceedance. In addition, Member States may, where appropriate, prepare short-term action plans where there is a risk of exceeding limit or target values⁴. In accordance with Article 24 of Directive 2008/50/EC, these action plans should set out measures to reduce the risk or shorten the duration of exceedances. Specifically, they may include measures to protect sensitive populations including children.

The questionnaire is designed to gather more information on the specific practise and experience with short-term measures and action plans in Member States in addition to what is already available through the standard air quality reporting.

Any analysis of practise of short-term action plans must take as a starting point the assessment of the requirement to prepare a short-term plan. Therefore, the questionnaire also addresses your risk assessment methods to exceed the alert thresholds and/or limit or target values together as well as your choice of measures to manage these risks.

The questionnaire focuses on:

- the risk assessment,
- the implementation strategy,
- the choice of measures and
- the impact of short-term measures and short-term action plans.

Your feedback will be analysed following pre-set criteria. As required by Article 24 of the Ambient Air Quality Directive, the results will be published in form of examples of best practices for drawing up short-term action plans. In the publication, no reference to the personal identity of the respondent will be given.

For each issue in the questionnaire we invite you to summarise your experiences (positive or negative), to mention any problems that you may have encountered and, possibly, ideas for solving such problems. For clarifying the issue and pointing out relevant aspects, a few introductory remarks have been given for each issue.

To allow inclusion of your comments in the summary, we would prefer to receive the filled-in questionnaire in electronic format by email by 31 August 2011. Please send it to Andrea.WEBER@ec.europa.eu, with a copy to AEA (beth.conlan@aeat.co.uk), where the results will be processed.

³ i.e. O₃, NO₂, SO₂

⁴ i.e. O₃, NO₂, SO₂, CO, Benzene, Lead, PM₁₀, PM_{2.5}

Informal questionnaire on the preparation and implementation of short-term action plans under Directive 2008/50/EC on ambient air quality and cleaner air for Europe

You are invited to give your views on the preparation and implementation of short-term Action Plans, your experience, or any problems and perhaps ideas for solutions. Each issue is briefly introduced by remarks and some questions that you are invited to answer. The questionnaire is also available on CIRCA at: http://circa.europa.eu/Public/irc/env/cape_baseline/library?l=/thematic_strategy/02-studies_projects/02-short_action&vm=detailed&sb=Title

➤ **Please use the white cells of the tables for filling in your replies.**

Respondent (for internal use only)	
Name	
Address	
Telephone	
Email address	
Organisation	

1 General	
<i>Introductory remarks:</i> The Directive states that Member States must prepare, publish and regularly monitor short-term action plans if there is a risk of exceedance of the alert thresholds. Member States may prepare an action plan if there is a risk that the limit or target values will be exceeded.	
1a. Do you have a short-term action plan in place?	<input type="checkbox"/> Yes <input type="checkbox"/> No
If Yes, please provide a copy or a link	
1b. Has there been an exceedance of alert thresholds (AT) and/or relevant limit or target values (LV/TV) in the past five years?	<input type="checkbox"/> Yes, AT <input type="checkbox"/> Yes, LV/TV <input type="checkbox"/> Yes, Both <input type="checkbox"/> No
If Yes, please provide details	
1c. Have you identified a risk of exceedance of alert thresholds (AT) and/or relevant limit or target values (LV/TV) in the past five years?	<input type="checkbox"/> Yes, AT <input type="checkbox"/> Yes, LV/TV <input type="checkbox"/> Yes, Both <input type="checkbox"/> No
If Yes, please provide details	
1d. Please briefly describe the national provisions regarding short-term action plans and provide the respective links.	

2. Risk assessment	
<i>Introductory remarks:</i> Short-term action plans may be initiated prior to the alert threshold being exceeded. Determining the risk of exceeding the alert thresholds is therefore a prerequisite to the preparation of short-term action plans. How important is the role of pollution forecasting in the preparation and or initiation of the short-term action plan?	
2a. Do you assess your risk of exceeding alert thresholds or relevant	<input type="checkbox"/> Yes

2. Risk assessment

limit and target values?

No

2b. If Yes, what assessment methods do you use? Please supply details of any method. Please also state how regularly this assessment is made and in how far different spatial levels are addressed.. Please also refer to note 2003/1 by the CAFÉ Working Group on Implementation *Necessity to prepare action plans to reduce the duration of exceedances of alert thresholds (Art 7(3), 96/62/EC⁵)* as well as Decision 2004/279/EC⁶.

2c. Comment on your practise of pollution forecasting; accuracy of the pollution forecasting, any problems and ideas for solutions:

2e. How did you predict the likely impact of your short-term action plan on pollutant concentrations? Please provide information about your emission source apportionment analysis and respective spatial references, and how this is related to the choice of the measures.

3. Short-term measures: Types and sectors

Introductory remarks: The Directive defines objectives of measures and provides examples of sectors to be targeted with short-term action plans.

⁵ Available at http://ec.europa.eu/environment/archives/cafe/pdf/working_groups/action_plans_necessity.pdf

⁶ Commission Decision 2004/279/EC concerning guidance for implementation of Directive 2002/3/EC of the European Parliament and of the Council relating to ozone in ambient air, <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2004:087:0050:0059:EN:PDF>

3. Short-term measures: Types and sectors		
3a. Does the short-term action plan specifically aim at:		
- reducing emissions	<input type="checkbox"/> Yes <input type="checkbox"/> No	
If Yes, please provide details		
- shortening duration	<input type="checkbox"/> Yes <input type="checkbox"/> No	
If Yes, please provide details		
- minimising exposure	<input type="checkbox"/> Yes <input type="checkbox"/> No	
If Yes, please provide details		
3b. Which types of measures are foreseen:		
- education/information	<input type="checkbox"/> Yes <input type="checkbox"/> No	
If Yes, please provide details		
- technical	<input type="checkbox"/> Yes <input type="checkbox"/> No	
If Yes, please provide details		
- economic/financial	<input type="checkbox"/> Yes <input type="checkbox"/> No	
If Yes, please provide details		
- special protection of sensitive population groups	<input type="checkbox"/> Yes <input type="checkbox"/> No	
If Yes, please provide details		
3c. Which sectors are targeted by short-term measures? As short-term measures might also be integrated in air quality plans, please give details of these short-term measures as well. Short-term measures within an air quality plan would be those measures which are not effective continuously but which become effective at times when there is a risk of high pollution levels (e.g. reduced speed limit during periods of high emission / high ambient air concentration levels).		
	Short-term action plan	Air Quality Plan
- Motor-vehicle traffic	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
If Yes, please provide details including expected quantified impacts		
- Construction works	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
If Yes, please provide details including expected quantified impacts		
- Ships at berth	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
If Yes, please provide details including expected quantified impacts		
- Use of industrial plants/products	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
If Yes, please provide details including expected quantified impacts		
- Domestic heating	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
If Yes, please provide details including expected quantified impacts		
- Other	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
If Yes, please provide details including expected quantified impacts		

4. Short-term action plans: Implementation strategy

Introductory remarks: To implement the short-term action plan legal and administrative responsibility within the Member State should be clear. A precise implementation plan is required including times, stages and measures as well as set structures for monitoring implementation and evaluating impacts.

4a. Please describe all of these aspects of your implementation strategy below and comment on your experience and views.

4b. Has your short-term action plan been initiated?

- Yes
- No

If yes, how often, in which situations? Please describe

4c. Please describe your processes for monitoring and evaluation.

5. Short-term action plans: Communication strategy

Introductory remarks: The Directive states that where Member States have drawn up a short-term action plan they shall make available to the public both the results of their investigations on the feasibility and the content of specific short-term action plans as well as information on the implementation of these plans.

5a Have you made such information available to the public?

- Yes
 - Internet
 - Radio
 - Television
 - Variable message signs
 - Other
- No

Please provide link to information or the information itself

5b Please describe your overall communication strategy including all relevant stakeholders.

6. Short-term action plans: Impact

6a. Please provide quantified details on the impact and the effectiveness of measures by objective and sector (see 3a and 3b).

6b. Which measures were found to be the most effective? Please describe and explain why.

6c. Please provide links to reports and/or references.

7. Short-term action plans and air quality plans

Introductory remarks: Where limit values are exceeded, short-term measures may also be included in air quality plans. Integration of air quality and short-term action plans is important.

4a. Have you included short-term measures to reduce, shorten the duration of the exceedances or minimise the exposure, in your Air Quality plan?

- Yes
 No

4b. *If yes*, comment on your experience and views; do the short-term action plan and air quality plan complement each other or are there antagonisms? Which aspects of the overall air quality strategy are supported by the short-term action plan?

4c. *If no separate short-term action plan has been in place* - would you see additional benefit if a separate short-term action plan would have been set up?

8. Any other issues

Please provide any other comments on issues not sufficiently covered.

Thank you very much for your cooperation!

Appendix 2 – Analysis of Airbase data for nitrogen dioxide

This Appendix identifies locations where there is a risk of exceeding the alert thresholds specified in Annex XII based on an analysis of the data contained in the European Air Quality Database (AIRBASE) for nitrogen dioxide.

The alert threshold for nitrogen dioxide is exceeded when the measured concentration exceeds $400\mu\text{g m}^{-3}$ over three consecutive hours at locations representative of air quality over at least 100 km^2 or an entire zone or agglomeration, whichever is the smaller.

The CAFE working group on Implementation produced a note Nr 2003/1 “Necessity to prepare action plans to reduce the duration of exceedances of alert thresholds (Art 7(3), 96/62/EC)”. This method requires an assessment of at least 5 years of data and applies the following criteria:

- If no value exceeds 80% of the alert threshold, there is no risk of exceedance
- If fewer data are available (1 - 4 years), there is no risk of exceedance if no level higher than 65% of the alert value was recorded
- If values exceed 80% of the alert threshold, the “exceedance” will be checked if it was affecting an area larger than 100km^2 (or covering a whole zone). This will be done using data from adjacent measurement sites. If other sites exist, but no levels are > 80% of the alert value, it will be concluded that there is no risk of exceeding the alert threshold in larger areas.
- If values exceed 80% of the alert threshold were observed in an area larger than 100km^2 (or covering a whole zone), it will be concluded that there is a risk of exceeding the alert threshold unless the emission situation has improved significantly in the years after the exceedances were observed.

In order to limit the number of measurements sites assessed, we first identified the sites where the concentration measured over one hour exceeded $400\mu\text{g m}^{-3}$ during the period 2005-2009 from the Airbase statistics dataset. For each of these sites, we then identified from the Airbase raw data the days when the concentration exceeded 80% of the alert value (i.e. $320\mu\text{g m}^{-3}$) for three consecutive hours. We also identified the days where the concentration exceeded the alert value for three consecutive hours. We then established whether there were other monitoring sites in the same agglomeration or zone and whether the concentration at other sites in the agglomeration or zone exceeded 80% of the alert value on the same day. These sites were then identified as “at risk” of exceeding the alert value over a representative area.

The following table provides the results of the analysis. It shows the results for sites where the maximum hourly nitrogen dioxide concentration exceeded the alert value (i.e. $400\mu\text{g m}^{-3}$). Column 5 shows the dates when the concentration exceeded 80% of the alert value for at least 3 consecutive hours. Column 6 identifies whether the alert value was exceeded for at least 3 consecutive hours (Y/N). Column 7 shows whether there were other monitoring sites in the same zone or agglomeration. Column 8 shows where the concentration exceeded 80% of the alert value for at least three hours at other sites in the zone or agglomeration on the same day. Column 9 shows where the measured concentrations indicate that the area of the monitoring station might be considered to be at risk of exceeding the alert threshold over a representative area.

Country	Site	Zone	City	Date	>Alert value	Other sites	Other sites 80% of alert	At risk ?
Bulgaria	BG0055	BG00006	Stara Zagora	20/11/09	N	Y	N	N
				22/11/09	N		N	
				23/11/09	Y		N	
				27/11/09	Y		N	
				28/11/09	N		N	
				6/12/09	N		N	
				22/12/09	Y		N	
				23/12/09	N		N	
				30/12/09	N		N	
	BG0052	BG00001	Sofia	21/12/05	N	Y	N	N
				17/01/05	N		N	
	BG0013	BG00003	Devnia	12/12/05	N	Y	N	N
	BG0050	BG00001	Sofia	14/1/08	N	Y	N	N
				22/1/08	N		N	
				13/1/09	N		N	
Czech Republic	CZ0ALEG	CZ010	Prague	18/6/09	N	Y	N	N
Germany	DEBY115	DEZDXX0001A		N	N	Y	N	N
	DEBW118	DEZCXX0007A		16/1/06	N	Y	N	N
				13/1/09	N			
	DEBW119			N	N			N
Spain	ES0116	ES1301	Madrid	19/5/05	N	Y	N	Y
				7/11/05	N		N	
				19/1/08	N		N	
				18/7/08	N		N	
				26/10/08	N		N	
				21/12/08	Y		N	
				22/12/08	N		N	
				23/12/08	Y		Y	
				25/7/09	N		N	
				17/10/09	N		N	

Country	Site	Zone	City	Date	>Alert value	Other sites	Other sites 80% of alert	At risk ?
				18/10/089	N		N	
				27/10/09	N		N	
				29/10/09	N		N	
	ES0117	ES1301	Madrid	23/12/08	Y	Y	Y	Y
	ES0119		Madrid	2/10/09	N	Y		N
				24/11/09	N			
	ES0801	ES0901	Prat De Llobregat (El)	23/10/07	N	Y	N	N
	ES0886	ES0510	Telde	10/5/07	Y	Y	N	N
				11/5/07	Y		N	
	ES1051		Coslada	N	N			N
	ES1132		Santa Cruz De Tenerife	N	N			N
	ES1161		Leã“N	N	N			N
	ES1163		Miranda De Ebro	N	N			N
	ES1192	ES1301	Madrid	8/11/2007	N	Y	N	N
	ES1240		Valencia	N	N			N
	ES1269		Oviedo	N	N			N
	ES1271		Gijã“N	N	N			N
	ES1288	ES0803	Salamanca	6/11/06	N	Y	N	N
				13/11/06	N		N	
	ES1307		Cesuras	N	N			N
	ES1429	ES1203	Santiago De Compostela	10/8/06	N	N		Y
				11/8/06	Y			
				16/8/06	N			
	ES1521		Madrid	N	N			N
	ES1643		Soria	N	N			N
	ES1764		Candelaria	N	N			N
	ES1831		Santa Eulalia	N	N			N

Country	Site	Zone	City	Date	>Alert value	Other sites	Other sites 80% of alert	At risk ?
			Del R��O					
	ES1846		Burgos	N	N			N
	ES1865		Puerto Del Rosario	N	N			N
Finland	FI00424		Imatra	N	N			N
France	FR31003			N	N			N
	FR10024	FR11N10		17/7/06	N	Y	N	N
	FR30021			N	N			N
	FR20003			N	N			N
	FR30034			N	N			N
	FR11034			N	N			N
	FR16034			N	N			N
	FR06006			N	N			N
Great Britain	GB0421		Billingham	N	N			N
	GB0641		Glasgow	N	N			N
	GB0659		London	N	N			N
	GB0682		London	N	N			N
	GB0620		London	N	N			N
	GB0583		Middlesbrough	N	N			N
Hungary	HU0020		Szeged	N	N			N
Ireland	IE0036		Dublin	N	N			N
	IE0135		Dublin	N	N			N
Italy	IT0983	IT0201	Aosta	28/1/05	N	Y	N	N
	IT1465	IT0301	Brescia	1/2/06	N	Y	N	N
	IT1488		Maddaloni	N	N			N
	IT0956		Roma	N	N			N
	IT1836	IT1201	Roma	21/12/07	N	Y	N	N
	IT1711		Catania	N	N			N
	IT0828		Roma	N	N			N
	IT0799		Messina	N	N			N

Country	Site	Zone	City	Date	>Alert value	Other sites	Other sites 80% of alert	At risk ?
	IT1829	Messina	Messina	15/6/09	Y	Y	N	N
				16/6/09	Y		N	
				17/6/09	Y		N	
	IT0477		Milano	N	N			N
	IT1496		Napoli	N	N			N
	IT1491	Napoli	Napoli	12/3/08	N	Y	N	N
	IT1137		Trieste	N	N			N
	IT1504	Salerno	Salerno	24/2/08	Y	Y	N	N
				25/2/08	N			
	IT1041		Salerno	N	N			N
	IT1346	Siracusa	Siracusa	28/12/06	N	Y	N	N
	IT1834		Roma	N	N			N
	IT1840		Urbino	N	N			N
Portugal	PT03075		Lisboa, Aml Norte	N	N			N
	PT01023		Ermesinde	N	N			N
	PT03095		Barreiro, Aml Sul	N	N			N
	PT03071		Lisboa, Aml Norte	N	N			N
	PT05010	Portimao	Portimãfo	9/3/07	Y	Y	N	N
				10/3/07	N		N	
Romania	RO0011	Timisoara	Timisoara	1/1/05	Y	N		Y
				9/1/05	Y			
	RO0065		Bucharest	N	N			N
	RO0066	RO081	Bucharest	20/3/06	N	Y	Y	Y
				5/10/06	N		N	
				17/11/06	N		Y	
				18/10/07	N		N	
	RO0067	RO081	Bucharest	7/12/05	N	Y	N	Y
				30/1/06	N		Y	

Country	Site	Zone	City	Date	>Alert value	Other sites	Other sites 80% of alert	At risk ?
				21/2/06	N		N	
				20/3/06	N		Y	
				22/3/06	N		N	
				4/10/06	Y		N	
				27/2/08	N		N	
				24/12/09	N		N	
	RO0068	RO081	Bucharest	28/10/08	N	Y	N	N
				31/10/08	N		N	
				5/12/08	N		N	
				6/2/09	N		N	
				9/10/09	Y		N	
	RO0069	RO081	Bucharest	20/2/06	N	Y	N	Y
				20/3/06	N		Y	
				9/2/07	N		N	
				29/11/07	N		N	
				20/2/08	N		N	
				26/2/08	N		Y	
				11/3/08	Y		N	
	RO0070	RO081	Bucharest	1/2/05	N	Y	N	Y
				9/2/05	N		N	
				15/3/05	N		N	
				17/4/05	N		N	
				18/9/05	N		N	
				3/10/05	N		N	
				8/11/05	N		N	
				26/11/05	N		N	
				13/12/05	N		N	
				29/12/05	N		N	
				18/1/06	N		N	
				30/1/06	Y		Y	

Country	Site	Zone	City	Date	>Alert value	Other sites	Other sites 80% of alert	At risk ?
				20/2/06	N		N	
				2/3/06	Y		Y	
				17/3/06	N		N	
				20/3/06	N		N	
				28/3/06	N		N	
				9/4/06	N		N	
				8/9/06	N		N	
				14/10/06	Y		N	
				17/11/06	N		N	
				30/7/07	N		N	
				18/9/07	N		N	
				18/10/07	N		N	
				26/2/08	N		Y	
	RO0063	Turnu Magurele	Turnu Magurele	22/10/05	N	Y	N	N
				2/7/06	N			
				27/9/06	N			
	RO0079	RO401	Craiova	8/11/06	Y	Y	N	N
				17/11/06	Y		N	
	RO0062		Turnu Magurele	N	N			N
Slovakia	SK0052	Malacky	Malacky	16/1/09	Y	N		Y ?(street canyon)
				21/10/09	N			
				26/11/09	N			
				1/12/09	N			

1

Appendix 3 - Analysis of Airbase data for sulphur dioxide

This Appendix identifies locations where there is a risk of exceeding the alert thresholds specified in Annex XII based on an analysis of the data contained in the European Air Quality Database (AIRBASE) for sulphur dioxide.

The alert threshold for sulphur dioxide is exceeded when the measured concentration exceeds $500\mu\text{g m}^{-3}$ over three consecutive hours at locations representative of air quality over at least 100 km^2 or an entire zone or agglomeration, whichever is the smaller.

The CAFE working group on Implementation produced a note Nr 2003/1 “Necessity to prepare action plans to reduce the duration of exceedances of alert thresholds (Art 7(3), 96/62/EC)”. This method requires an assessment of at least 5 years of data and applies the following criteria:

- If no value exceeds 80% of the alert threshold, there is no risk of exceedance
- If fewer data are available (1 - 4 years), there is no risk of exceedance if no level higher than 65% of the alert value was recorded
- If values exceed 80% of the alert threshold, the “exceedance” will be checked if it was affecting an area larger than 100km^2 (or covering a whole zone). This will be done using data from adjacent measurement sites. If other sites exist, but no levels are > 80% of the alert value, it will be concluded that there is no risk of exceeding the alert threshold in larger areas.
- If values exceed 80% of the alert threshold were observed in an area larger than 100km^2 (or covering a whole zone), it will be concluded that there is a risk of exceeding the alert threshold unless the emission situation has improved significantly in the years after the exceedances were observed.

In order to limit the number of measurements sites assessed, we first identified the sites where the concentration measured over one hour exceeded $500\mu\text{g m}^{-3}$ during the period 2005-2009 from the Airbase statistics dataset. We then identified those sites where the concentration exceeded $500\mu\text{g m}^{-3}$ over one hour at another site within 31.8 km (corresponding to a circle with area 100 km^2) in the same year in order to ensure that the measurement was representative of a wider area.

For each of these sites, we then identified from the Airbase raw data the days when the concentration exceeded 80% of the alert value (i.e. $400\mu\text{g m}^{-3}$) for three consecutive hours. We also identified the days where the concentration exceeded the alert value for three consecutive hours. We then established whether there were other monitoring sites within 31.8 km where the concentration at exceeded 80% of the alert value on the same day. Sites were considered to be “at risk” of exceeding the alert threshold over a representative area when the concentration exceeded 80% of the alert threshold both at the site and at another site within 31.8 km on the same day.

The following table lists the sites where the maximum hourly sulphur dioxide concentration exceeded the alert value (i.e $500\mu\text{g m}^{-3}$) and at another site within 31.8 km in the same year. Column 4 shows the dates where the sulphur dioxide concentration exceeded 80% of the alert value for 3 consecutive hours. Column 5 shows whether the alert value was also exceeded for 3 consecutive hours. Column 6 shows the dates where other sites within 31.8 km also exceeded 80% of the alert value for 3 consecutive hours on the same day. Column 7 identifies the sites considered to be “at risk” of exceeding the alert threshold over a representative area according to our analysis.

So₂

Country	Site	City	Date	>Alert value	Other sites 80% of alert	At risk ?
Austria	AT60136		N	N		N
	AT60135		N	N		N
Belgium	BELHB23	Hoboken	N	N		N
	BELWZ01	Lommel	14/8/08	N	N	N
	BELWZ02	Mol	N	N		N
	BETNO27		N	N		N
	BETR831	Antwerpen	N	N		N
	BETR897	Antwerpen	N	N		N
	BETR250		N	N		N
	BETR721	Gent	N	N		N
	BERTR750		N	N		N
Bulgaria	BG0056	Burgas	17/1/06	N	N	N
	BG0040	Sofia	N	N		N
	BG0044	Burgas	22/5/05	Y	N	N
			28/9/05	N	N	
			31/10/05	Y	N	
			13/1/08	Y	N	
			5/11/08	N	N	
	BG0041	Dimitrovgrad	5/4/05	N		Y
			7/11/05	Y		
			13/12/05	N		
			23/12/05	N		
			26/3/06	N		
			15/9/06	N		
			31/12/06	N		
			9/3/07	Y	N	
			30/7/07	N	Y	
			31/8/07	Y	N	
			25/10/07	N	N	
			28/10/07	N	N	
			29/12/07	N	Y	
			30/12/07	Y	N	
			07/01/08	N	N	
			20/01/08	N	N	
			25/01/08	N	N	
			04/02/08	N	N	
			5/11/08	N	N	
			6/11/08	Y	Y	
			15/11/08	N	N	

Country	Site	City	Date	>Alert value	Other sites 80% of alert	At risk ?
			9/4/09	N	N	
	BG0026	Galabovo	30/7/07	N	Y	Y
			29/12/07	Y	Y	
			6/11/08	Y	Y	
	BG0049	Pernik	20/12/05	Y	N	N
			25/11/06	N	N	
			3/12/06	N	N	
			30/12/07	Y	N	
			31/12/07	N	N	
			1/1/08	Y	N	
			13/1/09	N	N	
Czech Republic	CZOU MED		28/1/06	N	N	N
	CZOURVH		N	N		N
Spain	ES1039	Torrelavega	3/3/07	Y	N	N
			5/3/07	N	N	
	ES1037	Torrelavega	N	N		N
	ES0196	VillamanãN	N	N		N
	ES0763	Matallana De TorãO	21/1/06	Y	y	y
	ES1131	Santa Cruz De Tenerife	14/3/05	Y	N	y
			22/9/06	Y	N	
			30/10/06	N	N	
			13/2/07	Y	y	
			16/4/07	Y	N	
			18/4/07	Y	N	
			19/4/07	N	N	
			15/2/08	Y	N	
			14/3/08	Y	N	
	ES1132	Santa Cruz De Tenerife	6/4/05	N	N	N
	ES1764	Candelaria	N	N		N
	ES1772	Candelaria	N	N		N
	ES0110	Erandio	27/12/06	Y	N	N
	ES0327	Calanda	27/9/05	N	N	N
	ES0373	Congosto	12/6/05	N	N	Y
			16/6/05	N	Y	
			23/8/05	Y	N	
			28/8/05	N	N	
			26/9/05	Y	Y	
			22/6/06	N	N	
			26/6/06	Y	N	

Country	Site	City	Date	>Alert value	Other sites 80% of alert	At risk ?
			11/7/06	Y	N	
			23/7/06	N	N	
			21/8/06	N	Y	
			12/9/06	N	y	
			26/9/06	Y	Y	
			14/4/07	Y	N	
	ES0374	Toreno	N	N		N
	ES0376	Sancedo	31/1/06	Y	y	Y
			9/2/06	N	y	
	ES0377	Cabaña'As Raras	31/1/06	Y	y	Y
			26/12/07	N	N	
			21/7/08	N	N	
	ES0873	Palmas De Gran Canaria (Las)	N	N		N
	ES0886	Telde	12/5/07	Y	N	N
	ES1133	Candelaria	10/11/07	Y	N	N
	ES1228	Congosto	16/6/05	N	y	Y
			13/4/06	N	N	
			17/6/06	N	N	
			12/9/06	N	y	
			26/9/06	N	y	
	ES1229	Congosto	26/9/05	N	N	N
			14/3/06	Y	N	
			13/5/06	Y	N	
			29/6/06	N	N	
	ES1281	Ponferrada	N	N		N
	ES1592	Villadecanes	N	N		N
	ES1647	Leioa	N	N		N
	ES1592	Villadecanes	N	N		N
	ES1647	Leioa	N	N		N
	ES1771	Ponferrada	N	N		N
	ES1873	Cercs	N	N		N
	ES0074	Miã'O	N	N		N
	ES0094	Pontes De GarcãA RodrãGuez (As	N	N		N
	ES0201	Pontes De GarcãA RodrãGuez (As	N	N		N
	ES0339	Xove	5/11/05	Y	N	N
	ES0372	Ponferrada	N	N		N
	ES0375	Sancedo	9/2/06	N	y	Y
	ES0761	Cuadros	30/5/05	Y	N	N
			3/6/05	Y	N	

Country	Site	City	Date	>Alert value	Other sites 80% of alert	At risk ?
			15/12/06	N	N	
			18/12/06	N	N	
			20/1/07	Y	N	
			11/7/07	N	N	
	ES0762	Robla (La)	10/7/05	N	y	Y
	ES0813	Cerollera (La)	N	N		N
	ES1235	Arteixo	N	N		
	ES1285	Muras	N	N		
	ES1287	Guardo	N	N		
	ES1292	Leã"Ñ	N	N		
	ES1295	Velilla Del Rã"O Carriã"Ñ	N	N		
	ES1297	Robla (La)	1/1/05	N	N	Y
			4/6/05	N	N	
			10/7/05	N	y	
			4/10/05	Y	N	
			21/1/06	N	y	
			20/6/06	N	N	
			13/8/06	N	N	
			20/8/06	N	N	
			21/8/06	N	y	
			23/6/07	N	N	
			27/6/07	Y	N	
			5/7/07	Y	N	
			29/7/07	Y	N	
			19/9/07	N	N	
			28/11/07	N	N	
	ES1363	Siero	N	N		N
	ES1368	Palomar De Arroyos	N	N		N
	ES1369	Montalbã"Ñ	5/3/05	N		N
	ES1405	Vallibona	N	N		N
	ES1437	Pobla De Benifassã"Ñ (La)	N	N		N
	ES1543	Zorita Del Maestrazgo	N	N		N
	ES1647	Leioa	N	N		N
	ES1714	Getxo	N	N		N
	ES1758	Santa Cruz De Tenerife	13/2/07	Y	y	Y
			20/6/08	N		
France	FR01016		8/1/07	N	N	N
			6/12/07	N	N	
			8/12/07	N	N	

Country	Site	City	Date	>Alert value	Other sites 80% of alert	At risk ?
			3/1/08	Y	N	
			10/3/08	N	N	
			18/1/09	N	N	
			19/1/09	Y	N	
			22/12/09	N	N	
	FR01015		12/12/08	Y	N	N
	FR25047		N	N		N
	FR05083		8/11/05	Y	N	N
	FR05070		N	N		N
	FR5064		19/11/05	Y	N	N
			20/11/05	N	N	
			22/10/07	N	N	
			22/12/07	N	N	
			29/1/08	N	N	
	FR05080		N	N		N
	FR05010		N	N		N
	FR05069		N	N		N
	FR31023		N	N		N
	FR31024		21/9/05	N	N	Y
			23/9/05	Y	N	
			3/10/05	N	N	
			22/12/05	Y	N	
			07/01/06	Y	Y	
	FR31022		29/4/05	Y	N	n
			1/5/05	N	N	
			26/5/05	Y	N	
			29/8/05	N	N	
			22/9/05	Y	N	
			30/9/05	Y	N	
			9/10/05	Y	N	
			17/9/08	N	N	
	FR31021		3/6/08	Y	N	N
	FR31020		11/9/05	N	N	N
			3/11/05	N	N	
			25/11/05	Y	N	
			26/11/05	N	N	
			8/12/05	N	N	
			23/12/05	Y	N	
			1/1/06	N	N	

Country	Site	City	Date	>Alert value	Other sites 80% of alert	At risk ?
			16/2/06	N	N	
			23/1/07	Y	N	
			30/3/07	Y	N	
			19/4/07	Y	N	
			10/5/07	Y	N	
			13/5/07	Y	N	
			14/5/07	N	N	
			17/5/07	Y	N	
			16/10/07	N	N	
			27/10/07	N	N	
			31/8/08	N	N	
	FR02034		26/5/05	Y	Y	Y
			20/1/06	N	N	
			14/12/06	N	N	
	FR02007		26/5/05	Y	Y	Y
			15/12/06	N	y	
			23/12/06	Y	y	
			24/12/06	N	N	
			30/1/07	N	N	
			19/12/07	N	N	
			29/12/07	N	N	
			6/2/08	N	N	
	FR25011		N	N		N
	FR25034		6/11/06	N	N	N
	FR31019		7/1/06	Y	Y	Y
	FR02001		N	N		N
	FR02029		26/4/05	N	N	N
			24/5/05	Y	N	
			14/8/06	N	N	
			21/11/06	N	N	
	FR06011		N	N		N
	FR20029		14/12/05	Y	N	N
	FR01009		N	N		N
	FR05075		N	N		N
	FR02033		20/12/05	Y	N	y
			15/12/06	Y	y	
			23/12/06	Y	y	
			24/12/06	N	N	
	FR02036		N	N		N

Country	Site	City	Date	>Alert value	Other sites 80% of alert	At risk ?
	FR27003		N	N		N
	FR02020		N	N		N
	FR06019		N	N		N
	FR06004		N	N		N
Italy	IT0789	Milazzo	N	N		N
	IT1575	Portoscuso	4/8/06	N	N	N
			5/8/06	N	N	
	IT1576	Portoscuso	18/3/06	Y	N	N
			21/3/06	N	N	
			24/4/06	Y	N	
	IT1270	Sarroch	8/1/06	Y	N	N
			9/1/06	Y		
	IT1269	Sarroch	31/3/05	Y	N	N
			31/5/05	Y	N	
			15/6/05	N	N	
			4/4/06	Y	N	
			31/5/06	Y	N	
			2/11/06	Y	N	
			31/7/06	N	N	
			18/8/07	N	N	
			7/11/08	N	N	
	IT1435	Condro'	N	N		N
	IT1999	Genova	23/4/09	N	N	N
	IT1751	Busalla	31/10/09	Y	N	N
			6/11/09	N	N	
	IT1449	Santa Lucia Del Mela	N	N		N
	IT0792	Santa Lucia Del Mela	N	N		N
	IT1396	Portoscuso	2/1/05	N	N	N
			4/1/05	Y	N	
			6/1/05	Y	N	
			13/1/05	Y	N	
			21/1/05	Y	N	
			22/1/05	N	N	
			23/1/05	Y	N	
			24/1/05	Y	N	
			28/6/05	N	N	
	IT1273	Portoscuso	6/2/05	N	N	N
			7/2/05	N	N	
			24/2/05	N	N	

Country	Site	City	Date	>Alert value	Other sites 80% of alert	At risk ?
	IT0794	Pace Del Mela	4/7/06	N	N	N
			22/7/06	Y	N	
			27/7/06	Y	N	
			20/8/06	N	N	
Portugal	PT3082	Amadora, Aml Norte	N	N		N
	PT3098	Barreiro	N	N		N
	PT3095	Barreiro, Aml Sul	N	N		N
	PT3055	Barreiro, Aml Sul	2/6/06	N	N	N
			22/6/07	N	N	
			4/7/07	N	N	
			8/7/07	N	N	
			9/7/07	Y	N	
			8/6/08	N	N	
Romania	RO0078	Craiova	13/11/08	Y	Y	Y
	RO0079	Craiova	17/10/07	Y	Y	Y
			31/12/07	N	N	
	RO0080	Craiova	17/10/07	N	Y	Y
			13/11/08	Y	Y	
	RO0081	Isalnita	8/112/06	Y	N	N
			10/12/06	N	N	
	RO0082	Breasta	17/10/07	N	Y	Y
	RO0162	Baia Mare	11/4/08	N	N	N
			4/6/08	N	N	
			2/8/08	N	N	
			6/10/09	N	N	
			8/10/09	N	N	
	RO0161	Baia Mare	N	N		N
	RO0164	Baia Mare	N	N		N
	RO0165	Zona Femeziu	3/10/09	N	N	N
	RO0178	Brazi, Sat Brazii De Jos	N	N		N
	RO0180	Ploiesti	1/1/08	Y	N	N
Slovakia	SK0027	Handlova	N	N		N
	SK0012	Prievidza	N	N		N
Slovenia	SI0047	Dobovec	10/1/05	Y	N	Y
			12/1/05	Y	N	
			17/1/05	Y	N	
			31/1/05	Y	N	
			22/2/05	Y	Y	
			13/3/05	Y	N	

Country	Site	City	Date	>Alert value	Other sites 80% of alert	At risk ?
			8/8/05	N	N	
			18/8/05	Y	N	
			13/6/06	Y	N	
	SI0037	Hrastnik	N	N		N
	SI0033	Murska Sobota	N	N		N
	SI0050	Kum	N	N		N
	SI0049	Ravenska Vas	19/1/05	Y	N	Y
			28/1/05	Y	N	
			3/2/05	N	N	
			5/2/05	Y	N	
			6/2/05	N	N	
			7/2/05	Y	N	
			9/2/05	N	N	
			14/2/05	Y	N	
			15/2/05	Y	N	
			17/2/05	Y	N	
			18/2/05	Y	N	
			19/2/05	Y	N	
			21/2/05	Y	N	
			22/2/05	Y	Y	
			25/2/05	Y	N	
			2/3/05	Y	N	
			5/3/05	N	N	
			10/3/05	Y	N	
			15/3/05	Y	N	
			20/3/05	Y	N	
			21/3/05	Y	N	
			24/6/05	N	N	
	SI0039	Sostanj	8/12/06	Y	N	N
	SI0035	Trbovlje	14/9/05	Y	N	N
	SI0041	Veliki Vrh	N	N		N
	SI0036	Zagorje Ob Savi	N	N		N
	SI0031	Zavodnje	20/12/05	Y	N	N
	SI0044	Graska Gora	N	N		N

Appendix 4 Analysis of questionnaire 2004/461/EC data for ozone

This Appendix identifies locations where there is a risk of exceeding the alert thresholds specified in Annex XII based on an analysis of the data contained in the annual questionnaire 2004/461/EC returns for ozone.

For the implementation of Article 24, the alert threshold for ozone is exceeded when the measured or predicted concentration exceeds $240 \mu\text{g m}^{-3}$ over three consecutive hours. For this assessment, we have identified sites as being at risk of exceeding the alert threshold where the ozone concentration exceeds $240 \mu\text{g m}^{-3}$ on at least three hours in a day, based on data provided in Form 13b of the annual questionnaires 2004/461/EC.

The following table lists the sites where the alert threshold is exceeded on at least 3 hours in a day and provides the maximum hourly concentration during the exceedance period.

Sites exceeding the alert threshold for more than 3 hours in a day

Member State	Year	Zone code	Eol station code	Month	Day of month	Maximum 1-hour mean ozone concentration ($\mu\text{g}/\text{m}^3$) during exceedance period
Belgium	2005	BEF01A	42R831	6	24	256
	2005	BEF02A	42R811	6	24	260
	2005	BEF06A	42N016	6	24	274
	2005	BEF06A	42N035	6	24	251
	2006	BEW17S	43N066	7	26	260
Germany	2006	DEZIXX0102S	DENI043	7	20	251
	2006	DEZIXX0102S	DENI053	7	20	252
	2006	DEZJXX0010A	DENW067	7	20	272
	2010	DEZFX00003S	DEHE043	7	3	244
	2010	DEZIXX0102S	DENI062	7	10	251
Greece	2005	EL0003	EL0035A	7	9	267
	2005	EL0003	EL0035A	7	19	296
	2005	EL0003	EL0037A	7	19	261
	2007	EL0003	EL0028A	7	24	284
	2009	EL0003	GR0035A	7	18	264
Spain	2006	ES0115	ES1793A	8	12	269
France	2005	FR02N00001	FR0093A	6	19	240
	2005	FR02N00001	FR0093A	4	29	313
	2005	FR02N00001	FR0094A	5	26	251
	2005	FR02N00001	FR0094A	4	29	258
	2005	FR02N00001	FR1091A	4	29	249
	2005	FR02N00001	FR1093A	5	26	247
	2005	FR02N00001	FR1093A	8	30	277
	2005	FR03A00001	FR1112A	6	19	242
	2005	FR03A00001	FR1178A	4	29	241
	2005	FR03A00002	03069	6	28	254
	2005	FR03N00004	FR1111A	7	17	261
	2005	FR20N00001	FR0856A	6	28	240
	Italy	2005	IT0116	10308	5	28
2005		IT0116	10308	5	26	258
2005		IT0116	10308	5	25	274
2005		IT0310	301213	1	22	252
2005		IT0310	301213	1	28	261
2005		IT0313	301307	1	22	275

2005	IT0313	301307	1	27	327
2005	IT0313	301555	1	28	251
2005	IT0313	301555	1	22	252
2005	IT0313	301555	1	18	260
2005	IT0314	301305	1	28	253
2005	IT0314	301305	1	28	253
2005	IT0314	301305	1	27	256
2005	IT0314	301305	1	23	275
2005	IT0314	301305	1	22	275
2005	IT0424	402109	6	24	243
2005	IT0424	402109	6	23	255
2005	IT0501	502406	6	23	261
2005	IT1602	1607583	10	11	250
2005	IT19R2	Villasmundo	7	17	244
2006	IT0101	100122	7	21	281
2006	IT0310	301213	7	25	259
2006	IT0310	301213	7	24	263
2006	IT0310	301213	7	21	278
2006	IT0310	301213	7	22	279
2006	IT0313	301307	7	20	245
2006	IT0313	301307	7	22	256
2006	IT0313	301307	7	19	272
2006	IT0313	301307	7	21	289
2006	IT0313	301504	7	22	269.
2006	IT0313	301504	7	21	297.
2006	IT0313	301508	7	20	258
2006	IT0313	301555	7	22	259
2006	IT0313	301555	7	19	281
2006	IT0313	301555	7	21	283
2006	IT0313	301555	7	20	322
2006	IT0313	301813	7	25	257
2006	IT0313	301813	7	20	275
2006	IT0313	301813	7	22	277
2006	IT0313	309701	7	25	247
2006	IT0313	309701	9	5	271
2006	IT0313	309701	7	20	271.
2006	IT0313	309701	7	19	283
2006	IT0314	301305	6	15	251
2006	IT0314	301305	6	14	252
2006	IT0314	301305	6	13	257
2006	IT0314	301305	6	22	259.
2006	IT0314	301305	7	18	260.
2006	IT0314	301305	6	20	261.
2006	IT0314	301305	9	4	273.
2006	IT0314	301305	6	23	274
2006	IT0314	301305	9	5	276
2006	IT0314	301305	7	25	278.
2006	IT0314	301305	7	22	278.
2006	IT0314	301305	7	20	278.
2006	IT0314	301305	7	19	319
2006	IT0314	301305	7	21	370
2006	IT0315	301705	7	22	260
2006	IT0315	301705	7	20	272
2006	IT0315	301705	7	21	293
2006	IT0316	301216	7	21	281
2006	IT0316	301530	7	19	249.
2007	IT0101	100122	7	27	307
2007	IT0116	10303	7	19	266
2007	IT0116	10303	7	28	273
2007	IT0301	301216	1	19	274.

	2007	IT0301	301713	1	19	258.
	2007	IT0302	301213	1	19	291.
	2007	IT0302	301213	1	27	295.
	2007	IT0302	301218	1	19	279.
	2007	IT0302	309701	1	22	253.
	2007	IT0302	309701	1	27	281
	2007	IT0304	301305	1	27	301.
	2007	IT0304	301721	1	19	259.
	2007	IT0304	309702	1	27	268.
	2007	IT0501	502415	7	19	252
	2007	IT0501	502415	7	27	262
	2007	IT0501	502415	7	18	277
	2007	IT0501	502719	7	19	258
	2007	IT0709	701174	8	10	249
	2008	IT0301	IT1017A	6	27	276.
	2008	IT0301	IT1017A	6	27	276.
	2008	IT0301	IT1692A	6	27	245.
	2008	IT0301	IT1692A	6	27	245.
	2008	IT0302	IT1734A	7	25	245.
	2008	IT0302	IT1734A	7	25	245.
	2008	IT0302	IT1734A	6	27	282.
	2008	IT0302	IT1734A	6	27	282.
	2008	IT0302	IT1826A	7	25	257.
	2008	IT0302	IT1826A	7	25	257.
	2008	IT0302	IT1826A	6	23	265.
	2008	IT0302	IT1826A	6	23	265.
	2008	IT0302	IT1826A	6	27	283.
	2008	IT0302	IT1826A	6	27	283.
	2008	IT0304	IT1812A	6	25	245.
	2008	IT0304	IT1812A	6	25	245.
	2008	IT0304	IT1812A	6	27	298.
	2008	IT0304	IT1812A	6	27	298.
	2008	IT1501	IT1485A	4	27	285
	2009	IT0302	IT1466A	7	30	277.
	2009	IT0302	IT1734A	6	18	268.
	2009	IT0302	IT1876A	7	30	259.
Netherlands	2006	NL0300	NL0202A	7	26	259.
	2006	NL0320	NL0258A	7	26	276.
	2005	PT1005	PT0148A	8	7	242
	2005	PT1006	PT0142A	8	24	257
	2005	PT1006	PT0142A	6	23	261
	2005	PT1006	PT0142A	8	15	261
	2005	PT1006	PT0142A	7	22	268
	2005	PT1006	PT0142A	5	25	275
	2005	PT1006	PT0142A	8	16	275
	2005	PT1006	PT0142A	6	23	283
	2005	PT1006	PT0142A	8	7	296
	2005	PT1006	PT0142A	8	29	298
	2005	PT1006	PT0142A	6	18	301
	2005	PT1006	PT0142A	8	7	309
	2005	PT1006	PT0142A	7	21	312
	2005	PT1006	PT0142A	6	9	315
	2005	PT1006	PT0142A	8	6	320
	2005	PT1006	PT0142A	7	20	335
	2005	PT1006	PT0142A	7	12	343
	2005	PT1006	PT0142A	7	11	353
	2005	PT1006	PT0142A	7	13	359
	2005	PT1006	PT0142A	6	22	361
Portugal	2005	PT2003	PT0071A	8	5	332
Romania	2006	RO0401	RO0080A	8	20	274

United Kingdom	2006	UK0029	GB0045R	7	19	278
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