

Reporting on ambient air quality assessment in EU Member States and other EEA countries, 2012



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Front page picture:

The coal-fired units of this power plant in Blénod-lès-Pont-à-Mousson (France) have been closed down. However, the use of fossil fuels in power generation and industry remains an important source of air pollution. (Frank de Leeuw, 2008©)

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Summary

The number of designated zones in 2012 in the EU-27 (765) was lower than in 2011 (811) and even lower than in any previous year since 2006 (the first year of EU-27 wide reporting). The designation of zones for pollutants having a health related limit or target value is completed for SO₂, NO₂, PM₁₀, CO and ozone. For these compounds, the zones cover 90% or more of the population; exceptions are found in Romania where the population coverage may drop to around 80%. For PM_{2.5} an incomplete zoning (population coverage below 80 %) is found in Greece and Romania. For lead and/or benzene, the zones cover less than 80% of the population in Estonia (benzene), Italy (lead) and Romania (both pollutants). Similar to last year, Germany, France, Greece, Hungary, Italy, Portugal, Romania, and Slovakia have different zone designations for PM₁₀ and PM_{2.5}.

In 2012, the percentage of zones in all reporting countries exceeding the limit values set for the protection of human health was highest for the NO₂ annual limit value and the daily limit value of PM₁₀ (percentages were 30% and 29%, respectively). The health-related target value of O₃ has been exceeded in a slightly larger fraction (34%). Compared to 2011 the fraction of zones in exceedance of PM₁₀ LV is this year lower; for the NO₂-annual limit value and ozone target value similar fractions were found in both years.

Looking at the population, the highest fraction potentially exposed to levels above the LV or TV is found for the annual LV of NO₂ (46%), next the daily LV of PM₁₀ (38%), followed by the O₃ TV (35%).

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1. Introduction

This document provides an overview of the annual reports from reporting countries (both Member and non-Member States) to the European Commission on the results of the assessment of their air quality with respect to the EU limit and target values over the year 2012. These national reports have been submitted under the Air Quality Directives (EU, 2004b, 2008), following Commission Decision 2004/461/EC (EU, 2004a), which specifies the information to be sent in detail and provides a set of forms to be filled in. This Decision will further be referred to as ‘the questionnaire’ or, when the context is not directly clear, ‘the AQ questionnaire’.

Following the 4th Daughter Directive (4th DD) (EU, 2004b), in 2007 the questionnaire was changed to include relevant forms covering monitoring of arsenic (As), nickel (Ni), cadmium (Cd), mercury (Hg), benzo(a)pyrene (BaP) and other polycyclic aromatic hydrocarbons (PAH) in ambient air and deposition. In 2010 further changes were introduced in the questionnaire to enable the communication of information on the application of Articles 15 (on PM_{2.5}) and 22 (on time extension) of Air Quality Directive 2008/50/EC. Forms have been added, enabling reporting countries to report on the attainment of the PM_{2.5} target value.

The questionnaire consists of 28 forms (see Annex I) with in total 90 sub-forms. The updated questionnaire and guidance documents have been made available on the website of DG Environment¹. On this website, assessments of the air quality in zones in the EU Member States based on the questionnaire for previous years are also available, as well as on the European Topic Centre on Air Pollution and Climate Change Mitigation (ETC/ACM) website².

Not all (sub)forms of the questionnaire will be discussed in this report; focus will be on those forms containing information directly related to the attainment status of the zones. In some of the other forms voluntary information is requested; although very valuable (for example, Form 19 providing information on the area and population exposed to concentrations above LV or TV) the reported information is generally too scattered to prepare an EU-wide assessment.

DG Environment requested the European Environment Agency to compile this report. The ETC/ACM prepared the document.

On the incoming questionnaires the ETC/ACM performed a number of quality checks. These checks mainly relate to completeness and consistency (both within the Questionnaire as with the information submitted under the Exchange of Information Decision (EU 1997, 2001)). Based on the checks, country specific feedback reports have been prepared. The reporting countries have been asked to react on these reports. A summary of the quality procedure is given in section 1.1; a more extensive description has been given in an ETC/ACM Working Paper (de Leeuw et al, 2012)

According to the Air Quality Directive 2008/50/EC, the Commission’s Implementing Provision 2011/850/EU (EU, 2011) has been introduced. This decision lays down the rules for air quality reporting, and has to be applied as of 1 January 2014. So, 2012 was the last reporting year using Commission Decision 2004/461/EC (EU, 2004a). Reporting on attainment over the year 2013 will be done according to the new system (e-reporting). More information on the implementing provision can be found in an EEA Technical report (EEA, 2012); detailed information is available on the Air Quality portal³.

¹ <http://ec.europa.eu/environment/air/quality/legislation/reporting.htm>

² <http://acm.eionet.europa.eu/reports>, under “ETC/ACM Technical Papers”

³ <http://www.eionet.europa.eu/eqportal>

1.1. Member State reports addressed

This document primarily deals with the reports by the EU Member States on the year 2012 submitted under the Air Quality Framework Directives, and the 4th DD using the questionnaire. On a voluntary basis Norway and Kosovo, under UNSCR 1244/99, submitted a questionnaire. Note that this report covers the EU27; Croatia has become an EU Member State by 1 July 2013 and has to report on attainment of air quality limit and target values by 1 October 2014 on the reporting year 2013.

Reporting countries have uploaded their questionnaires on Reportnet CDR (<http://cdr.eionet.europa.eu/>). In October 2013 the ETC/ACM sent out a mailing request to all contact persons in the reporting countries informing on the outcome of a first review of the submitted questionnaires. In this request, several tables summarizing the reporting from the countries were included. In March/April 2014 a second mailing request was sent to the countries, which focused on possible inconsistencies within the questionnaire itself and within the meta-information as provided under the Exchange of Information decision (see below 1.2). In both mailing requests the countries were invited to check the summaries which had been provided by the ETC/ACM. A number of countries submitted a revised questionnaire or separate form(s) that had been revised.

1.2. Reporting under the Exchange of Information Decision

The Air Quality Directives focus mainly on compliance checking against the obligations (air quality standards and objectives) they set (see Annex II). In parallel, reporting countries submit detailed information from their monitoring networks under the Exchange of Information Decision (EU, 1997, 2001) every year. These reports contain monitoring data for a range of pollutants and measured on different temporal scales. Furthermore, they include extensive complementary information about the monitoring stations (metadata). The ETC/ACM annually published an assessment of these reports⁴. To avoid double reporting by countries, some of the data necessary for evaluating the reports under the air quality directives are only required under the EoI Decision. This is particularly the case for the meta-information on monitoring stations. All monitoring stations used for compliance checking under the AQ Directives have to be included in the set of monitoring stations submitting data under the EoI. The deadline for submitting the EoI information was 1 October 2013. In the assessment of those parts of the questionnaire related to monitoring stations, the information extracted from the EoI has been included.

1.3. Common technical errors in data submission

To facilitate the submission of the required data and information by the countries, the European Commission prepared an AQ questionnaire template in Excel format. This format does not reject erroneous data, and during the processing numerous small errors, e.g. spurious spaces, have to be removed before all reports can be joined in a database. A second form of common errors was the use of other symbols than prescribed in the questionnaire or its guidelines, for example, ticking an "x" or "+" instead of the prescribed "y"; or using a comma as separator while the semi-colon is prescribed. Although in general the information was unambiguous, a time consuming correction of this type of errors was necessary before the data could automatically be processed. There were also errors in the 2012 data that required more insight in order to correct them. Examples are inconsistent use of zone codes and pollutant codes or use of codes that were not allowed. Another type of error is that reporting countries do not use the same codes for stations in the AQ questionnaire and EoI reports. Reporting countries have always reacted actively on the

⁴ Available from http://acm.eionet.europa.eu/databases/airbase/eoi_reports/index.html

feedback reports of the ETC/ACM. As a result the quality of the data has been improved over the years.

Disclaimer

This report contains summary information based on data delivered before 18 May 2014. Revisions or information communicated by reporting countries after this date have not been included. In order to enable an automatic processing of the national reports, the ETC/ACM has made a number of (in general editorial) changes in the submitted questionnaires. It cannot be excluded that mistakes or misinterpretations have emerged during this process. Hence, this report presents an overview of the air quality in the Member States of the European Union and the other reporting countries but it cannot be used for legal compliance checking.

Abbreviations used

Reporting countries have been abbreviated following the ISO3166-1 country alpha-2 code¹:

Austria: AT; Belgium: BE; Bulgaria: BG; Cyprus: CY; Czech Republic: CZ; Denmark: DK; Estonia: EE; Finland: FI; France: FR; Germany: DE; Greece: GR; Hungary: HU; Ireland: IE; Italy: IT; Latvia: LV; Lithuania: LT; Luxembourg: LU; Malta: MT; Netherlands: NL; Poland: PL; Portugal: PT; Romania: RO; Slovakia: SK; Slovenia: SI; Spain: ES; Sweden: SE; United Kingdom: GB²; Norway: NO; and Kosovo under UNSCR 1244/99 :XK.

AEI	Average Exposure Indicator (PM _{2.5})
AQ questionnaire	Questionnaire on air quality set out by Commission Decision 2004/461/EC
As	Arsenic
B(a)P or BaP	Benzo(a)pyrene
Cd	Cadmium
CDR	Central Data Repository
CO	Carbon monoxide
DD	Daughter Directive
EoI	Exchange of Information Decision: Council Decision 97/101/EC, amended by Commission Decision 2001/752/EC
EU27	The 27 EU Member States after accession of 12 new Member States in 2004 and 2007
LTO	Long Term Objective (O ₃)
LV	Limit value
MOT	Margin of Tolerance
MS	Member State(s)
Ni	Nickel
NO ₂	Nitrogen dioxide
NO _x	Nitrogen oxides
O ₃	Ozone
PAH	Polycyclic Aromatic Hydrocarbons
Pb	Lead
PM ₁₀	Particulate matter composed of particles smaller than 10 micrometer in aerodynamic diameter
PM _{2.5}	Particulate matter composed of particles smaller than 2.5 micrometer in aerodynamic diameter
RC	Reporting Countries
SO ₂	Sulphur dioxide
TV	Target value

Notes

1: see http://www.iso.org/iso/country_codes.htm

2. Including Gibraltar.

2. Designation of zones

The number of designated zones in 2012 in the EU-27 (765) was lower than in 2011 (811). The 2012 zoning adjustments compared to 2011 are:

- Romania increased the number of zones from 50 to 54 zones
- Italy reduced the number of zones from 151 to 109 zones
- The Czech Republic reduced the number of zones from 15 to 10 zones
- Germany reduced the number of zones from 110 to 109 zones
- Portugal reduced the number of zones from 26 to 25 zones
- Spain reduced the number of zones from 157 to 156 zones

The designation of zones for pollutants having a health related limit or target value is completed for SO₂, NO₂, PM₁₀, CO and ozone. For these compounds, the zones cover 90% or more of the population; exceptions are found in Romania where the population coverage may drop to 80%. For PM_{2.5} an incomplete zoning (population coverage less than 90%) is found in France, Greece, Italy, Romania and Slovakia. For lead and/or benzene, the coverage is also incomplete: in a number of Member States (Estonia, Italy and Romania) the zones cover less than 80% of the population. Similar to last year, Germany, France, Greece, Hungary, Italy, Portugal, Romania, and Slovakia have different zone designations for PM₁₀ and PM_{2.5}.

The situation with respect to the Fourth Daughter Directive has slightly improved this year. However, Romania has still not defined zones for B(a)P and Malta didn't designate zones for Ni; in addition, in France and Italy the defined zones for B(a)P cover less than 90% of the population. In Bulgaria, France, Italy and Romania zones for As, Cd and/or Ni, cover less than 90% of the entire population.

The countries have designated zones to assess and manage air quality in order to comply with EU-regulations. To optimize management of air quality due to differences in sources and abatement strategies, the delimitations of zones may differ between pollutants.

As the countries are free in defining their zone structure and characteristics (population and area), the designated zones vary widely, depending on the chosen variable(s): size, population, measured individual pollutant and/or types of protection targets. This complicates mutual comparison of final results between countries.

Table 1 gives an overview of the total number of zones defined for 2012 (information extracted from Form 2). Compared to reporting year 2011 (Jimmink et al., 2013) there are various changes in the designation of zones. In Form 0 general information on zone boundaries is requested. Here, 18 countries reported that zone designation was unchanged compared to the previous report. Two countries explicitly reported that changes in zone designation have been made. The remaining eight countries did not provide information on this point.

Kosovo under UNSCR 1244/99 has designated zones for the first time for all pollutants except NO_x. In contrast to last year, a (voluntary) reporting on zones and their attainment situation over 2012 has not been received from Iceland.

Malta, in comparison to 2011, has designated zones for Pb, As, Cd and BaP, but did not designate zones for nickel (Ni). As was also the case over 2011, Romania did not designate zones for B(a)P. Belgium and Hungary did not designate zones for the protection of vegetation for both SO₂ and NO_x, Latvia and Lithuania did not designate zones for the protection of vegetation for NO_x.

The lowest number of zones is found for the two objectives related to the protection of vegetation. In relation to the protection of health, the number of zones defined in the EU Member States for NO₂

and PM₁₀ – the pollutants showing the largest number of exceedances - tends to be higher (about 660) than for the other pollutants (520-630). The number of zones defined for the 4th DD-pollutants is relatively low, 455-474, but larger than in 2011.

Table 1. Number of zones per reporting country in 2012, including the designation of the zones for individual pollutants or types of protection targets (data extracted from form 2).

Reporting Country	Total (a)	SO ₂		NO ₂	NO _x	PM ₁₀	Lead	benzene	CO	Ozone	As	Cd	Ni	BaP	PM _{2.5}
		health	veg												
AT	19	11	8	11	8	11	11	11	11	11	11	11	11	11	11
BE	22	12	0	11	0	11	11	7	7	6	10	10	10	7	11
BG	6	6	1	6	1	6	4	6	6	6	4	4	5	6	6
CY	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
CZ	10	10	8	10	8	10	10	10	10	10	10	10	10	10	10
DE	109	75	15	83	15	80	70	80	80	66	67	67	67	71	73
DK	3	3	1	3	1	3	3	3	3	3	3	3	3	3	3
EE	4	4	4	4	4	4	4	2	4	4	4	4	4	4	4
ES	156	132	38	134	38	135	81	122	128	135	82	82	82	82	135
FI	18	14	1	14	1	14	14	3	14	2	2	2	2	2	14
FR	76	74	6	74	16	74	61	61	76	73	57	57	57	60	60
GB	44	44	43	44	43	44	44	44	44	44	44	44	44	44	44
GR	4	4	2	4	2	4	4	4	4	4	4	4	4	4	2
HU	10	10	0	10	0	10	10	10	10	10	10	10	10	10	6
IE	4	4	1	4	1	4	4	4	4	4	4	4	4	4	4
IT	109	95	17	98	17	98	83	94	95	76	58	58	58	56	82
LT	3	3	1	3	0	3	3	3	3	3	3	3	3	3	3
LU	4	3	1	3	1	3	3	1	1	3	3	3	3	3	3
LV	2	2	1	2	0	2	2	2	2	2	2	2	2	2	2
MT	2	2	1	2	1	2	2	2	2	2	2	2	0	2	2
NL	9	9	1	9	1	9	9	9	9	9	9	9	9	9	9
PL	46	46	16	46	16	46	46	46	46	46	46	46	46	46	46
PT	25	1	7	20	6	23	1	1	1	19	1	1	1	1	1
RO	54	50	4	41	2	44	26	38	49	45	13	22	22	0	17
SE	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
SI	8	6	4	6	4	6	7	6	6	6	7	7	7	6	6
SK	11	9	1	10	1	10	2	10	9	2	2	2	2	2	8
EU27	765	636	189	659	194	663	522	586	631	598	465	474	473	455	569
NO	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
XK	2	2	1	2	0	2	1	1	2	2	1	1	1	1	2
all	774	645	197	668	201	672	530	594	640	607	473	482	481	463	578

The total number of zones in the EU-27 countries showed a decrease from 811 in 2011 to 765 in 2012. However, in the majority of reporting countries the number of designated zones for each of the pollutant/protection target combinations has been unchanged. For nine Member States changes have been found for one or more pollutants, see Annex V for a detailed comparison with the 2011 deliveries.

Since 2004 the number of zones has been reduced by 36% (Annex V). This reduction is mainly caused by a stepwise reconstruction of the zoning in Poland in 2007 and 2010 which resulted in a net reduction of 316 zones. Germany has realized a net reduction of 36 zones. The largest increase (+16)

in zones is seen in Spain. In other countries the number of designated zones remains relatively stable.

Since 2010 reporting on PM_{2.5} has been mandatory. Compared to 2011 differences in the number of PM_{2.5} zones are seen for the Czech Republic, Germany, France, Hungary, Italy and Romania. When comparing zone designation for PM₁₀ with zone designation for PM_{2.5} it is seen that in general (in 19 Member States plus Kosovo under UNSCR 1244/99 and Norway) they are exactly the same. Similar to last year, eight MS have defined a lower number of zones for PM_{2.5} than for PM₁₀: Germany (80 and 73 zones for PM₁₀ and PM_{2.5} respectively), France (74 and 60 zones), Greece (4 and 2), Hungary (10 and 6), Italy (98 and 82), Portugal (23 and 1), Romania (44 and 17) and Slovakia (10 and 8).

As discussed in earlier reports (Jimmink et al., 2011, 2012, 2013), the designation of zones differs widely between the reporting countries. In the Questionnaire the reporting countries do not provide background information on the procedures followed in the designation. An overview of the applied methodologies can therefore not be given; however, by comparing the information on zones, various different approaches can be listed:

- At least two or more zones are defined, also for the smaller MS like Malta or Luxembourg. An exception is Cyprus: one zone designated for all pollutants covers the entire country.
- A number of countries designate the same set of zones for all the pollutants (for example Czech Republic, United Kingdom, the Netherlands, Poland, Sweden); this set of zones is generally not changed from year to year.
- Other countries (for example Austria) have defined two or more sets of zones for specific pollutants; these sets are also stable over the years.
- In some Members States (for example Germany and Italy) the designation of zones is not stable and is changed from year to year.
- Frequently, but not in all cases the zone boundaries coincide with administrative boundaries; exceptions are found for zones designated for the protection of ecosystems or vegetation for which boundaries may coincide with natural parks;
- Frequently but not in all cases a zone forms a continuous area. Examples of a zone consisting of various scattered areas can be found in Belgium where the medium-sized cities are grouped into one zone BEFS05; similar examples are found in various German Federal States.

In previous reports some examples were shown for different approaches of designation for PM₁₀ zoning (Jimmink et al., 2011) and for O₃ zoning (Jimmink et al., 2013). This year we take a closer look at B(a)P zoning designation between reporting countries, the results are presented in Table 2. With respect to the zones related to health protection, the smallest number has been defined for B(a)P. Partly, this relates to the fact that Romania has not defined any zone for B(a)P; if Romania would have designated 13-22 zones (as for the other 4th DD-pollutants) the total number of B(a)P zones would be in line with the other 4th DD-pollutants. The relative low number of zones could be explained by the low concentrations in relation to the target values. In large parts of Europe, concentrations are even below the lower assessment threshold. MS tend to group areas showing small gradients and low levels, together. A clear example is Portugal; whereas this country has designated 20-23 zones for PM₁₀ and NO₂, pollutants showing typical hotspots, the whole country is grouped into one zone for the 4th DD pollutants and even for PM_{2.5}.

It may not be implied, however, that notwithstanding attainment with the B(a)P TV, health risks are small or negligible. As B(a)P is a carcinogenic, no safe concentration can be defined. When accepting an additional life time risk of 1×10^{-5} due to exposure to B(a)P in ambient air (i.e. one new cancer incidence per 100 000 inhabitants attributable to the exposure to B(a)P), annual mean concentration may not exceed 0.12 ng/m³ (de Leeuw, 2012). This level, which is below the lower assessment threshold of 0.4 ng/m³, is expected to be widely exceeded in Europe. The EEA (2014) estimates 76-94 % of the urban population is exposed to higher levels than 0.12 ng/m³.

Like the case for PM₁₀ and O₃, the size and population of a zone may differ several orders of magnitude within a country. Compared to O₃ and PM₁₀ the B(a)P zone tends to be slightly larger; the total population living in B(a)P agglomerations is about the same as ozone or PM₁₀ agglomerations.

Table 2. The total population per reporting country and the percentage of the total population living in agglomerations as defined for B(a)P ; minimum, averaged and maximum area and population in a B(a)P-zone (data extracted from form 2; population (per 1/1/2012) taken from Eurostat).

Reporting Country	Total population	% population in agglomerations defined for B(a)P	Area in a B(a)P-zone			Population in a B(a)P -zone		
			minimum	average	maximum	minimum	average	maximum
AT	8,408,121	27	198	7 625	19 185	255 000	747 273	1 706 000
BE	11,094,850	24	136	4 371	16 484	251 244	1 576 564	5 495 609
BG	7,327,224	100	504	18 485	48 023	363 375	1 221 204	2 288 659
CY	862,011	(a)	9 251	9 251	9 251	862 000	862 000	862 000
CZ	10,505,445	24	230	7 890	17 624	380 900	1 062 750	1 517 600
DE	81,843,743	34	(c)			37 268	1 151 581	8 009 197
DK	5,580,516	24	313	14 488	42 682	311 000	1 854 667	4 252 000
EE	1,325,217	34	42	10 884	32 176	46 032	347 900	623 106
ES	46,818,219	45	6	6 155	94 223	5 243	574 023	3 265 033
FI	5,401,267	20	791	168 426	336 061	1 075 465	2 697 877	4 320 288
FR	65,287,861	37	57	8 109	43 502	61 116	955 357	10 448 449
GB	63,495,303	39	7	5 778	43 571	29 752	1 436 454	8 864 078
GR	11,123,034	39	129	33 007	69 747	800 764	2 741 005	3 606 734
HU	9,931,925	26	61	9 248	84 317	60 896	995 773	5 005 422
IE	4,582,707	26	185	17 573	68 482	227 040	1 141 415	2 390 646
IT	59,394,207	20	10	3 245	14 790	3 987	839 226	3 593 025
LT	3,003,641	28	157	21 767	64 742	308 831	995 924	2 143 726
LU	524,853	(a)	238	862	2 105	154 636	174 951	212 820
LV	2,044,813	32	307	32 448	64 589	649 953	1 020 882	1 391 810
MT	417,546	54	39	158	276	190 332	208 727	227 121
NL	16,730,348	31	174	4 616	17 222	231 575	1 844 331	4 940 679
PL	38,538,447	23	56	6 801	34 841	102 979	837 944	3 232 193
PT	10,542,398	(a)	88 827	88 827	88 827	10 155 558	10 155 558	10 155 558
RO	20,095,996	(b)	-	-	-	-	-	-
SE	9,482,855	33	927	75 039	292 645	509 167	1 580 476	2 829 548
SI	2,055,496	18	147	3 379	7 092	107 516	341 520	603 387
SK	5,404,322	8	368	24518	48669	415589	2705418	4995247
EU27	501,822,365	34	6	24 188	336 061	3 987	1 464 454	10 448 449
NO	4,985,870	29	465	46 258	109 474	188 793	710 433	1 770 437
XK	1,794,180	(a)	10 178	10 178	10 178	1 610 473	1 610 473	1 610 473

^a country has not designated an agglomeration as B(a)P-zone.

^b Romania has not designated any B(a)P zone.

^c area of zones has not been reported.

The limit values for the protection of human health apply throughout the whole territory of the Member States. Therefore, all areas should belong to a zone related to health protection targets. Consequently, the population living in zones related to those targets should add up to the national

total population number. National totals on area and population, provided by Eurostat⁵ or the FAO⁶, have been used here as a reference. However, small deviations are to be expected in view of the different information sources and deviating census base years.

Within a deviation of 5%, the total surface area of the health-related zones indeed added up to the national surface area for most of the reporting countries. For SO₂, NO₂, PM₁₀, and ozone, the designated zones are in good agreement throughout the entire EU-27 with deviations in Romania; with respect to PM_{2.5}, the spatial coverage of zones is low (less than 80%) in France, Greece, Italy and Romania. For the other components the national area is less well covered, although 19 countries are in good agreement. In France, Romania, Italy and Bulgaria, the coverage is less than 80% for seven, six, three and three components, respectively.

In addition to a complete coverage of the area, it is more important to have a full coverage of the total population. Compared to previous years, the situation has slightly improved but a full EU-coverage is not yet met. Figure 1 compares the national population with the total population in zones designated for each of the health related objectives. Again, a nearly complete coverage is in general found for SO₂, NO₂, PM₁₀ and ozone. Lower coverages are found in the case of benzene and lead; the 4th DD pollutants have the least coverage. The population coverage for PM_{2.5} is less than 80% in Greece and Romania.

Within the 5% deviation range, 21 reporting countries have attained full population coverage for all pollutants. In general, a population coverage of less than 90% is found for those pollutants for which exceedances of the limit or target values are rarely observed (for a number of these pollutants, concentrations are even below the lower assessment threshold, for example, lead, benzene, CO). An exception is formed by PM_{2.5}; population coverage of 30-85% is found in France, Greece, Italy and Romania. For Romania the designated zones for all 4th DD pollutants cover less than 50% of the total population. In addition, an apparent covering of less than 70% or less for one or more 4th DD pollutants still exists in Bulgaria.

Summarizing, 20 out of 27 Member States and Norway have designated zones for all health related pollutants which apparently meet the EU criteria of a full coverage of the population (i.e. 95% or more). Two Member States (Estonia and Greece) still have a lack of agreement for one pollutant, and agreement is very poor in four Member States (Bulgaria, France, Italy and Romania) for two or more of the health-related pollutants. In Kosovo the coverage of the population is only 90% for six pollutants.

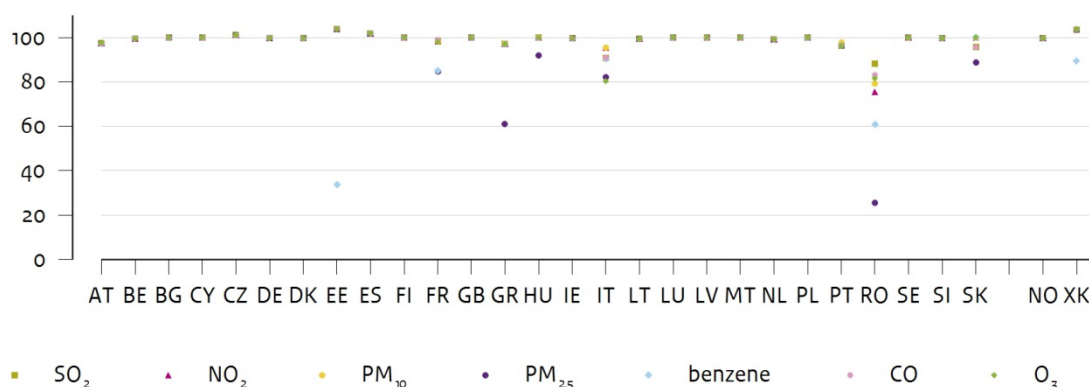


Figure 1a. Total population living in zones designated in relation to health protection targets as fraction of the national population.

⁵ Eurostat, demographic balance and crude rates, population on 1 January 2012, downloaded July 2014.

⁶ FAO statistical data, total country area in 2009, downloaded on 5 September 2011.

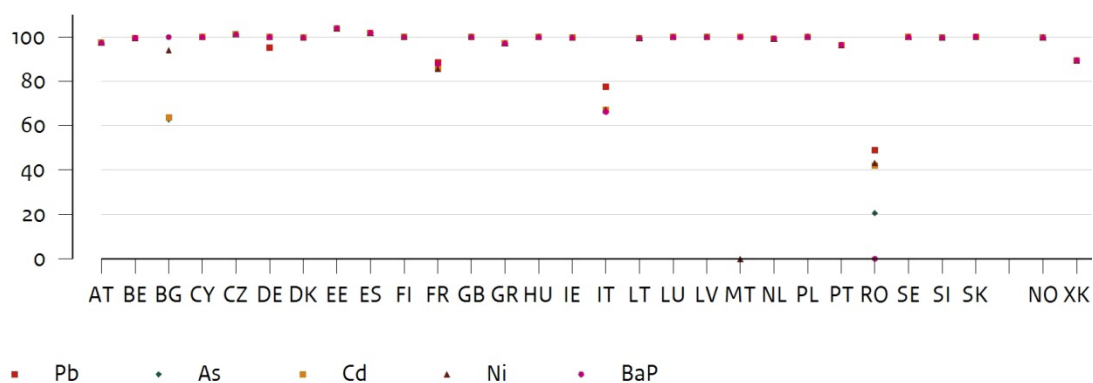


Figure 1b. Total population living in zones designated in relation to health protection targets as fraction of the national population.

3. Air Quality assessments

If measurements or model calculations indicate that a limit value (or limit value plus margin of tolerance) or a target value is exceeded somewhere in a zone, the whole zone is designated as being in exceedance concerning this threshold. The information presented in this chapter is mainly extracted from the forms 2, 8 and 9 of the AQ questionnaire. It focuses on pollutants/protection targets, where compliance poses problems. An overview of the limit and target values is given in Annex II.

- *Please note: The number or percentage of zones in exceedance is a limited indicator for the actual area where air quality exceeds the limit or target value. First of all, the area in exceedance might be the entire zone or just a few hundred square metres at a hotspot. In addition, some reporting countries have designated a few very large zones for pollutants known to have concentration levels substantially below air quality thresholds in the country. Hence, the number or percentage of zones cannot be used to estimate the area in exceedance or to compare actual population exposure to air pollution between different reporting countries or even between regions within a country. Similarly, changes from year to year do not necessarily imply a trend in air quality or in the number of people exposed.*

In 2012, the percentage of zones in all reporting countries exceeding the limit values set for the protection of human health was highest for the NO₂ annual limit value and the daily limit value of PM₁₀ (percentages were 30% and 29%, respectively). The health-related target value of O₃ has been exceeded in a slightly larger fraction (34%), see Figure 2a. Compared to 2011 the fraction of zones in exceedance of PM₁₀ LV is this year lower; for the NO₂-annual limit value and ozone target value similar fraction were found in both years.

Looking at the population, the highest fraction potentially exposed to levels above the LV or TV is found for the annual LV of NO₂ (46%), next the daily LV of PM₁₀ (38%), followed by the O₃ TV (35%). (Figure 2b)

A summary of the attainment situation is presented in Annex IV. A link to a spreadsheet containing the list of zones per reporting country and their status in relation to the air quality objectives is given.

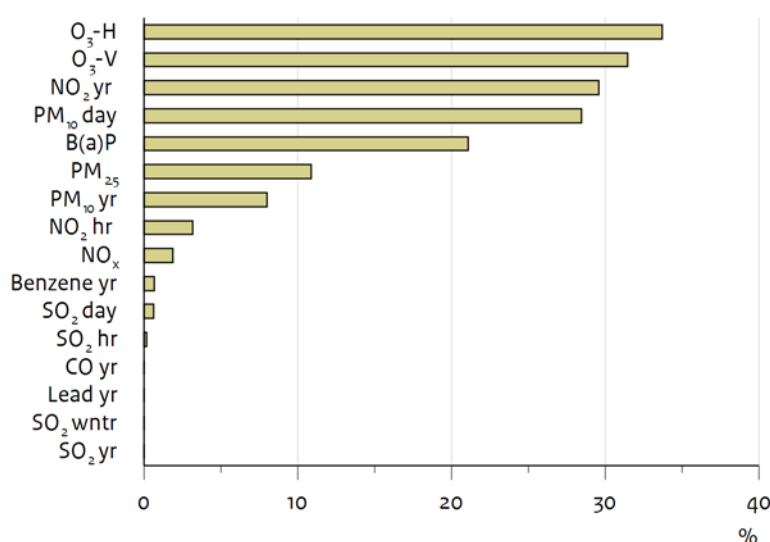


Figure 2a. Fraction of EU-27 zones in exceedance per limit or target value, 2012.

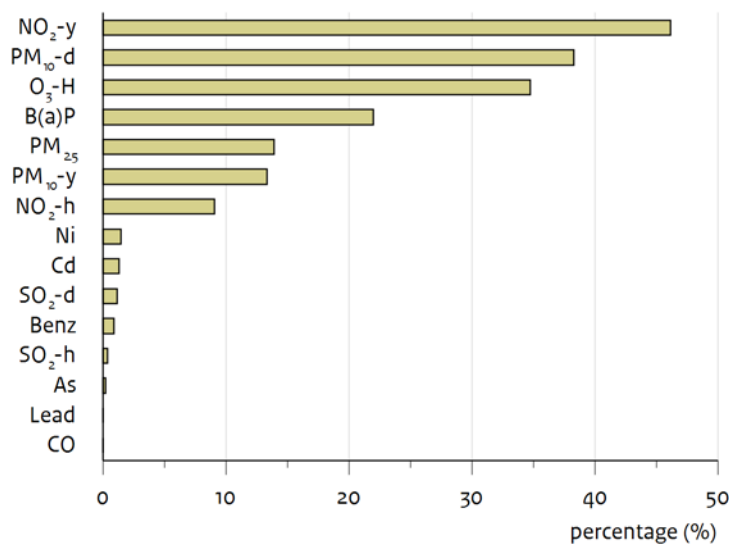


Figure 2b. Fraction of population potentially exposed to concentrations above limit or target values, 2012.

3.1. Main exceedances related to human health

Figures 3-7 show the reporting countries zones in exceedance maps for the PM₁₀ daily limit value, the PM_{2.5} annual limit value (to be in force in 2015), the O₃ health-related target value, the NO₂ annual limit value and the B(a)P annual target value (see also Annex II). White areas in the maps represent areas in countries where no zones had been designated. Territories marked yellow are areas where zones had been designated, but no information on the air quality status was reported. In both of the above mentioned cases those reporting countries are not fulfilling the criteria of the Directive, as zoning and reporting is mandatory for all health-related pollutants.

The maps presented in Fig 3-7 and in Annex III are based on the information provided by the countries in forms 8 and 9. Some inconsistencies might be seen when compared with the zone definitions given in form 2. Explanation is that some countries provided attainment information for a zone not defined for the pollutant/protection target combination in question. In a feedback the countries are informed on these “undefined” zone(s) but in the countries’ replies the inconsistencies between forms 2 on one side and forms 8 and 9 on the other, have not in all cases been solved. This situation mostly occurs for the 4th DD pollutants.

For NO₂, red, violet and purple territories are areas where an exceedance occurred:

- For zones without time extension (time extension has not been requested or granted, see section 3.2.1):
 - no exceedance of the limit value (green);
 - exceedance of the limit value (red);
- For zones with time extension granted:
 - no exceedance of the limit value (green);
 - exceedance of the limit value but not of the margin of tolerance (violet);
 - exceedance of both the limit value and the margin of tolerance (purple).

For O₃ and B(a)P, a red zone indicates an exceedance of the target value and for ozone, orange means an exceedance of the long term objective but not of the target value.

Figure 3 shows exceedances of the PM₁₀ daily limit value in a number of urban agglomerations and regions where high PM₁₀ levels are well documented by measurements (see, for example, EEA 2014). Examples are the Po Valley in Italy, Belgium and the southern Netherlands, the Ruhr area, Central and Eastern Europe. However, zones in exceedance can also be found in Norway, Sweden, Latvia, south Spain and the Balkans. Here, exceedance might have been reported at one or two hot-spot stations resulting in a whole zone in non-compliance.

Note that the PM₁₀-map does not account for subtractions of natural contributions and/or of contributions of winter-sanding and salting (see section 3.4)

In EU-27 the PM_{2.5} limit value (to be met in 2015) was exceeded in a total of 63 zones, see Figure 4. Most of these occurred in Poland and Italy, there were a few or just one in Bulgaria, Czech Republic, Romania, Slovakia, Hungary and France. From earlier studies (De Leeuw and Ruysenaars, 2011) it is known that the PM₁₀ daily limit value is more stringent than the PM_{2.5} annual limit value.

In EU-27 the O₃ health-related target value was exceeded in a total of 205 zones, see Figure 5. Similar to previous years, there is a limited number of zones (46 in Europe plus 5 in France d'outre-mer) not exceeding the long-term objective of 120 µg ozone/m³. In view of the ozone climatology one would expect ozone levels below the LTO mainly in Northern Europe (see e.g. EMEP, 2012; Horalek et al, 2013). Local cold-spots might also occur in urban areas where ozone concentrations are locally depressed due to the chemical interaction with freshly emitted NO_x (NO_x-titration). However, Figure 5 shows a number of green coloured zones in the south of Europe: southern Portugal, Italy (Lombardia, Sardinia and Sicily) and northern Greece. Ozone 2012 monitoring data available in AirBase v8 (including stations which have not been assigned as stations reporting under the AQ Directive, e.g. because the data quality objectives have not been met) show that in these zones maximum daily 8-hour mean concentrations do exceed the LTO value of 120 µg/m³ during one or more days. Further supported by the analysis of the summer 2012 situation (EEA, 2013), it is very unlikely that the LTO has been met in these zones.

For the zones in Romania the AirBase data confirms that the maximum daily 8-h mean concentrations are below 120 µg/m³. However, most of the ozone stations are located in urban areas where ozone concentrations are lower than in a more rural background region. EMEP modelling data (Gauss et al., 2013) indicate SOMO35 levels in Romania to be around 3000 -4000 (µg/m³).day. In more northern countries where ozone levels fall between LTO and TV, lower SOMO35 level are observed. It is therefore unlikely that in the more rural areas in Romania the LTO is met.

For NO₂ the map is presented in Figure 6. The most agglomeration exceedances of the ALV occur in Germany (35), UK (29), Italy (23) and France (19). For 19 zones in the United Kingdom the reported exceedances are based on modelled results. In the Netherlands all designated zones reported exceedance to the LV, but not the MOT. As the Netherlands were granted time extensions for the annual limit value of NO₂ for all zones, they still attain the AQD objectives.

The health target value for B(a)P was exceeded in 102 zones (see Figure 7). In the Czech Republic and Lithuania all designated zones exceeded the TV. In addition, Bulgaria, Finland, Greece, Hungary, Poland and Slovenia have nearly all their designated zones for B(a)P exceeding the TV.

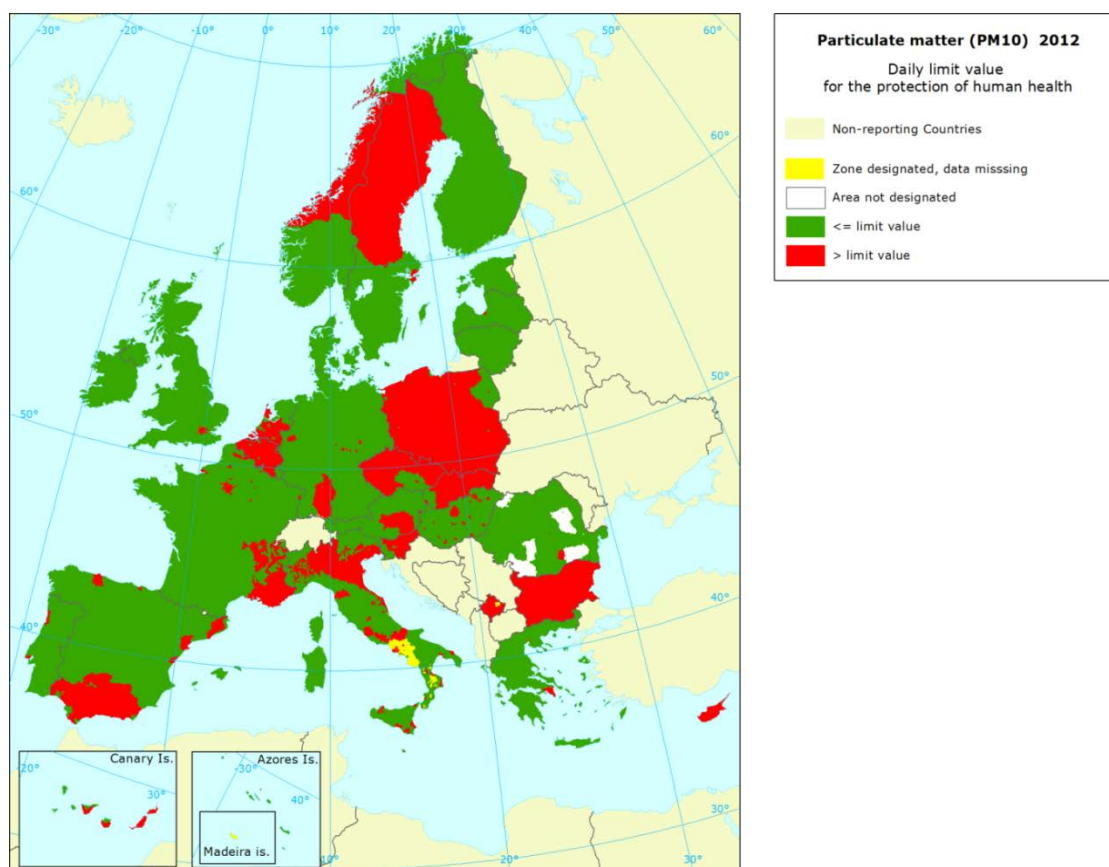


Figure 3. Zones in exceedance of the daily PM_{10} limit value in 2012 (not accounting for subtractions of natural contributions and/or of contributions of winter-sanding and salting).

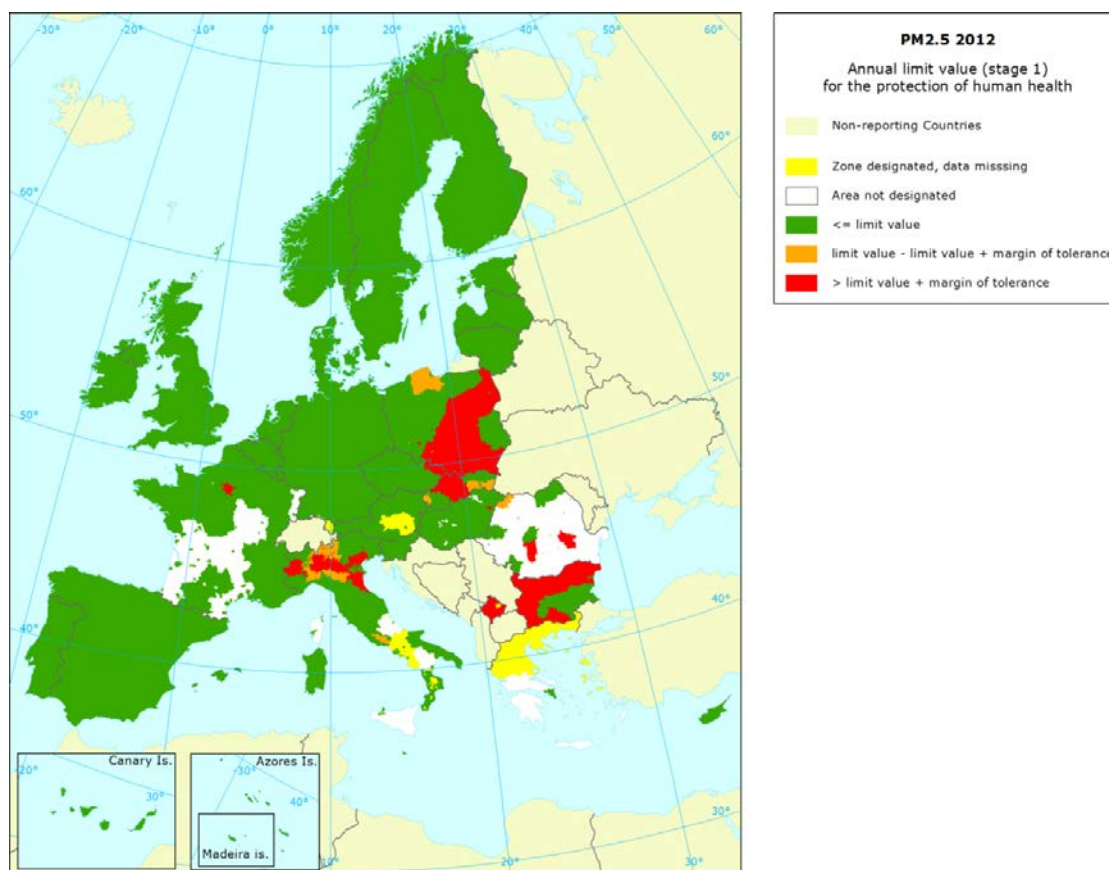


Figure 4. Zones in exceedance of the annual limit value for $PM_{2.5}$ in 2012.

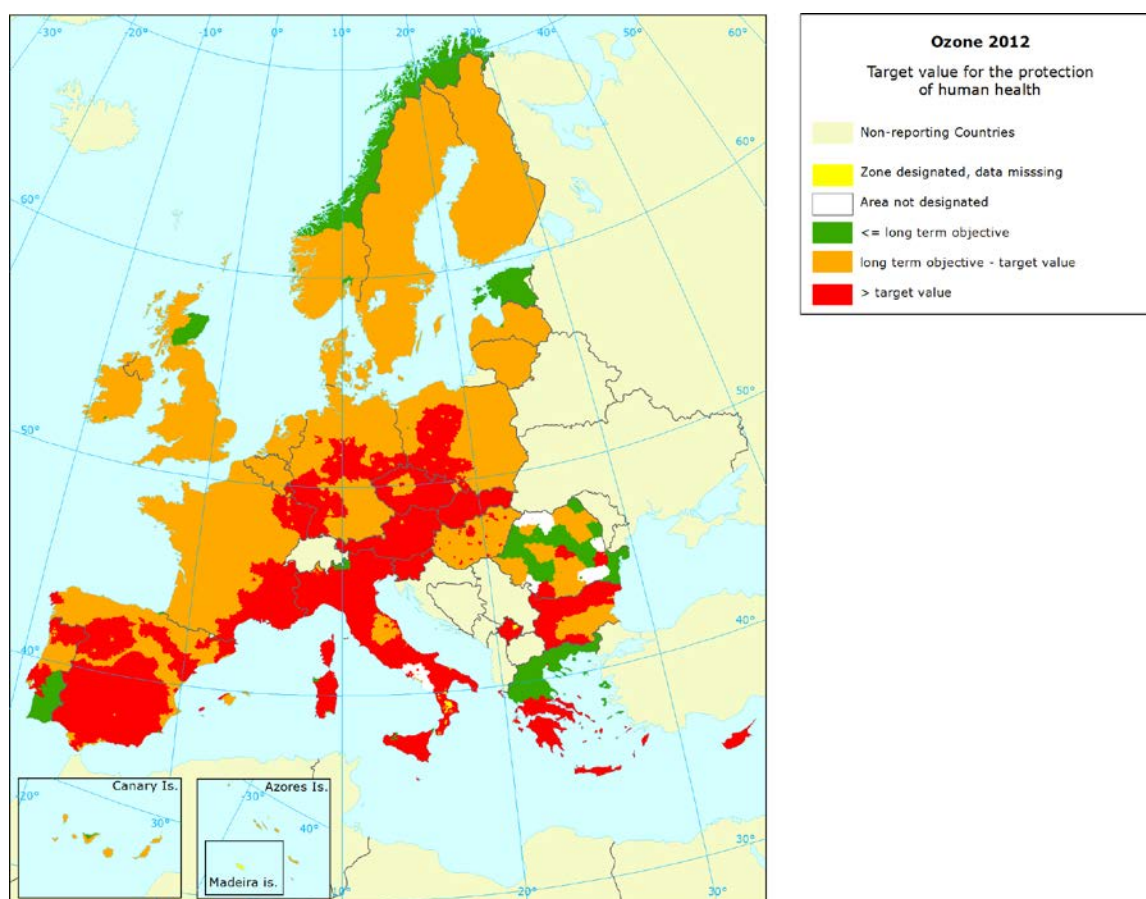


Figure 5. Zones in exceedance of the health related target value for O_3 in 2012.

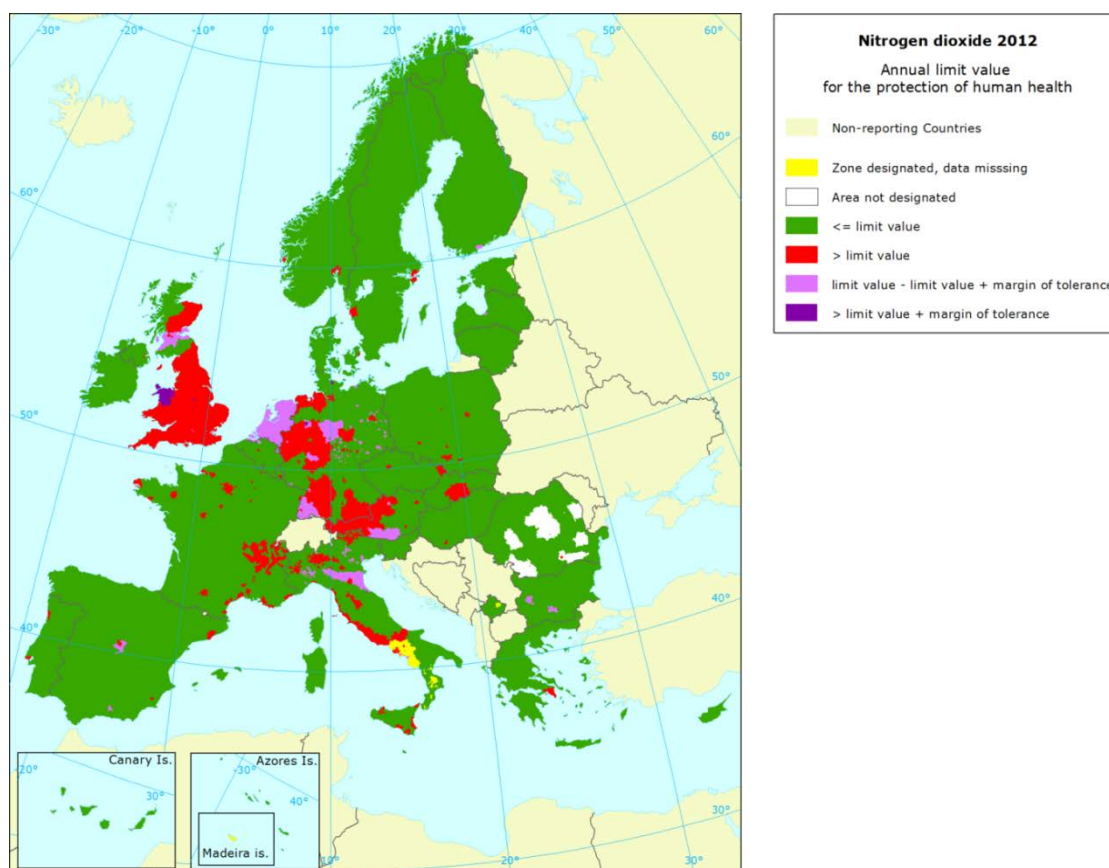


Figure 6. Zones in exceedance of the annual limit value for NO_2 in 2012.

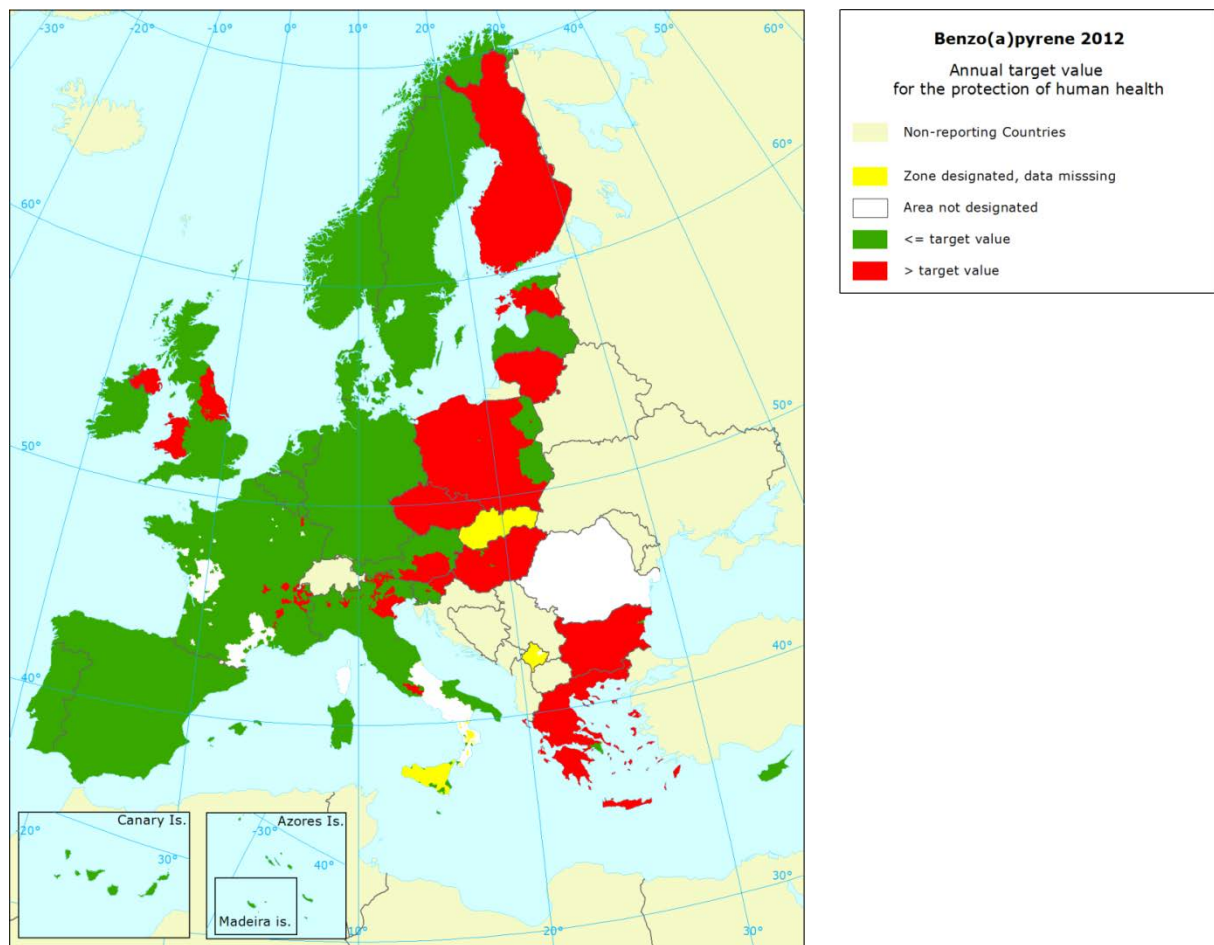


Figure 7. Zones in exceedance of the annual target value for B(a)P in 2012.

3.2. Overview of available information on PM_{2.5}, Averaged Exposure Indicator

The air quality directive sets for PM_{2.5} an annual target value of 25 $\mu\text{g}/\text{m}^3$ to be attained in 2010, which will become a limit value starting in 2015. This level which has to be met at all locations is discussed in section 3.1. In addition the directive also established a national exposure reduction target; and an exposure concentration obligation: by 2015 urban concentrations representative for the exposure of the general population (the average exposure indicator (AEI)) shall not exceed 20 $\mu\text{g}/\text{m}^3$. The AEI is an averaged level of concentrations (in space – per country and time – over a three-year period), measured at urban background monitoring stations (representative of general population exposure). Reporting countries provided information on selected stations and measurement configurations for determination of the AEI and reported on the observed AEI. Not in all cases the chosen averaging period was 2010-2012; Ireland, Luxembourg and Romania reported on the averaging period 2009-2011. Information on the averaging period has not been reported by Bulgaria, Spain, Greece, Poland and Portugal. Four MS (Estonia, Hungary, Latvia and Slovakia) did not report on the AEI in their 2012 reports. In order to have an overview for all MS, we have calculated the three-year running mean (2010-2012) as the mean of the annual averaged concentration over all operational (sub)urban background stations in each individual year (data available from AirBase). This approximated AEI (Figure 8) is not based on a stable set of stations and may include urban background stations which have not been assigned as “AEI” station by the MS. In general, the officially reported AEI, based on a dedicated set of (sub)urban station, agrees well with the AEI

estimated here on the basis of all operational (sub)urban background stations. Figure 8 indicates that in at least eight EU Member States the average urban concentrations in the 2010-2012 period were above $20 \mu\text{g}/\text{m}^3$.

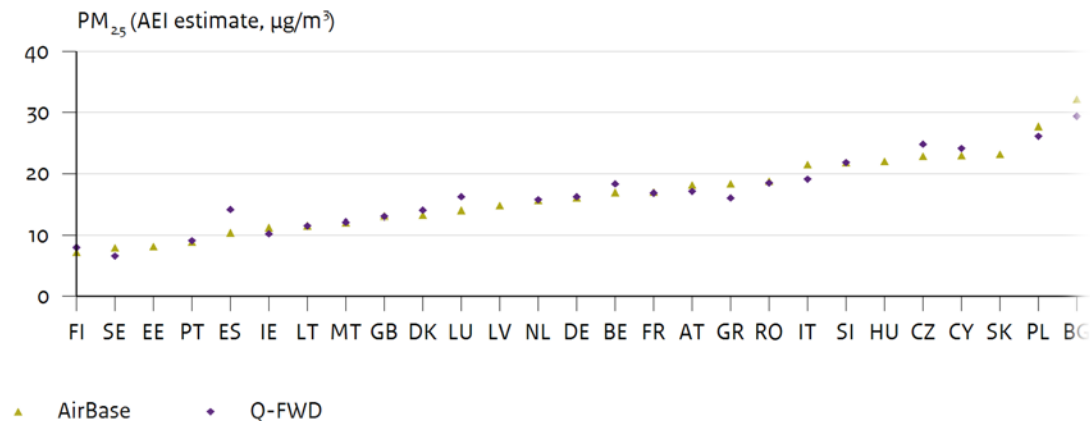


Figure 8. Average Exposure Indicator (AEI): estimated AEI, three-year running mean; AEI as reported in the AQQ (purple diamonds; form 28) refers to the averaging period 2010-2012, except for Ireland, Luxembourg and Romania (averaging period 2009-2011); Bulgaria, Spain, Greece, Poland and Portugal did not provide information on the selected averaging period. AirBase results (green triangles, reference period 2010-2012) is based on data from all operational (sub)urban background stations.

3.3. Comparison with Eol information

The Exchange of Information Decision requires that for all stations used for compliance checking (that is, all stations listed in the AQQ) meta-information and concentration data has to be submitted. A comparison of the information in the AQQ and in AirBase shows that for 99.5% of the stations listed in Form 3 meta-information can be retrieved from AirBase. A similar agreement is found for ozone stations (Form 4).

In a few cases one or more of the regulated pollutants has – according to the information provided in questionnaire – not been measured in a country. For lead no fixed measurements have been made in Finland, Hungary, Norway and Sweden; benzene is not measured in Finland. In all cases the concentration are below the lower assessment threshold and no fixed measurements are required. However, in AirBase recent (2012) data is additionally available in Finland (lead, benzene) and Sweden (lead). For Malta monitoring data and assessment information on nickel is lacking in questionnaire and AirBase.

For the monitoring of B(a)P no stations are installed in Greece, Romania and Sweden; but in AirBase additional raw data is available for two Swedish stations. Greece reports exceedances of the target value based on model information. Any information on the B(a)P levels in Romania is lacking.

When matching at the level of a measurement configuration (that is, checking whether the 2012 concentration data of a station/pollutant combination listed in Form 3 or 4 is available from AirBase) larger differences are found. For the classical pollutants (SO_2 , NO_2 , CO , O_3 and PM_{10}) for nearly all measurement configurations the 2012 concentration data are also included in the national Eol submissions: a correspondence of 90% or less is found for SO_2 (Greece) and CO (Cyprus). On $\text{PM}_{2.5}$, inconsistencies are found for Hungary (no raw data available in AirBase for one out of 8 stations) and Ireland (no raw data available at all). With respect to the 4th DD pollutants, information on raw data is clearly missing for a relatively larger number of station (>30%) for Denmark (As, Cd, Ni), Ireland, Italy and Slovakia (As, Cd, Ni and B(a)P).

3.4. Derogation situations

In three situations a (temporally) exceedance of the limit value is permitted, according to the AQ Directive 2008/50/EC:

- (i) Art. 22 allows a temporally exceedance of the limit values of PM₁₀ (until 2011), NO₂ and benzene (until 2015 in both cases) under specific conditions;
- (ii) when exceedances are attributable to natural sources (Art. 20); and
- (iii) when PM₁₀ exceedances are attributable to winter-sanding or –salting of roads (Art. 21).

Time extensions

Following art. 22 in the AQ Directive, Member States having particular difficulties in achieving compliance with the limit values for particulate matter (PM₁₀), nitrogen dioxide or benzene, may have requested the Commission for a postponement of attainment by a maximum of five years (until 1 January 2015 for NO₂ and benzene) or an exemption of the obligation of appliance up to three years (until June 2011 for PM₁₀). During those periods the limit values continued to apply plus a margin of tolerance. Derogation has been given for individual zones; in all other zones compliance with limit values is required.

Information on the notifications for time extension submitted by the Member States and the decisions of the Commission in reply to these requests are available on the European Commission's website⁷.

In a number of cases the designation of the zones included in the notifications of the MS have been changed over the years. In general, a match could be made between the original zone and the current (2012) zone on the basis of additional information submitted by the Member States. A table, covering the period 2008-2012 for zones for which time extension has been granted is presented in Table 3. In this table the zone code and zone as defined in 2012 have been given.

In the case of PM₁₀, time extension was allowed until June 2011 which implies that over the reporting year 2012 the limit values as defined in the Air quality Directive (see Annex II) were to be met for all zones. Here we provide an overview on the actual (2012) attainment in those zones where time extension had been granted until June 2011.

For the daily PM₁₀ limit value, time extensions had been granted for 56 zones in the EU Member States. In these 56 zones the attainment situation strongly varies over the years. Whereas at the start of the time extension period in 2008 already 18 zones reported that PM₁₀ levels were below the daily limit value, in the following years the number of zones reported to be in compliance is 21 (2009), 16 (2010) and 6 (2011). Notwithstanding the additional abatement measures which have been implemented in the time extension zones, from the 2012-reporting it has to be concluded that in 24 zones concentrations are still above the daily limit values. For two zones (ES0705 and UK0001) a claim for subtraction of natural contribution brings the number of exceedance days within the allowable range.

Time extension has been granted for 10 zones for the annual PM₁₀ limit value. The zone CY001A (Cyprus) is the only zone which is not in compliance in 2012. The non-compliance is very persistent in this zone during the past 5 years (2008-2012). However, after subtraction of the natural contributions to the annual mean concentration (see below), the maximum concentration in the zone CY001A drops below the limit value resulting in a compliant situation.

⁷ http://ec.europa.eu/environment/air/quality/legislation/time_extensions.htm

Postponement for both the annual and hourly limit value of NO₂ had been granted for two zones in Bulgaria. In addition, in 81 zones time extension was granted for the annual limit value, and in 4 zones for the hourly limit value. While in 2010, annual mean concentrations are above the limit value in all 83 zones, maximum concentrations have been fallen below the limit value in an increasing number of zones: 6 zones in 2011 and 14 zones in 2012.

Improvement in air quality has also been observed with respect to the hourly limit value. In 2012 compliance is observed in five out of six zones.

Table 3a-d. Status in zones for which time extension has been granted for a) annual (ALV) or b) daily limit values (DLV) for PM₁₀ (nr=AQ status not retrievable); c) both ALV and DLV for PM₁₀; and d) NO₂ annual and hourly limit value. The grey shaded cells indicate no time extension was granted in the zone for this particular limit value.

a) PM₁₀ ALV

Zone code	zone name	2008	2009	2010	2011	2012
CY001A	CYPRUS	>lv	>lv	>lv	>lv	>lv
DEZCXX0007A	Ballungsraum Stuttgart	>lv	lv-mot	lv-mot	<lv	<lv
HU0001	Budapest region	<lv	<lv	<lv	<lv	<lv
HU0008	Sajó valley	lv-mot	<lv	<lv	>lv	<lv
HU0011	Allotted cities	lv-mot	<lv	<lv	<lv	<lv
IT1102	Zona B	<lv	<lv	<lv	<lv	<lv

b) PM₁₀ DLV

Zone code	zone name	2008	2009	2010	2011	2012
AT_02	Kärnten	<lv	<lv	>lv	>lv	<lv
AT_03	Niederösterreich	<lv	>lv	>lv	>lv	<lv
AT_06	Steiermark ohne AG Graz	>lv	<lv	>lv	>lv	>lv
AT_07	Tirol	<lv	<lv	>lv	>lv	<lv
AT_09	Wien	>lv	>lv	>lv	>lv	<lv
AT_40	AG Linz	>lv	<lv	>lv	>lv	<lv
AT_60	Graz	>lv	>lv	>lv	>lv	>lv
CZ031	Jihočeský kraj	>lv	>lv	>lv	>lv	>lv
CZ0640	Jihomoravský kraj	>lv	>lv	>lv	>lv	<lv
DEZAXX0006S	Orte erhöhter verkehrsbedingter Schadstoffbelastung im Land Brandenburg ab 2005	>lv	lv-mot	lv-mot	>lv	<lv
DEZCXX00070S	Gebiet (ohne Ballungsräume) mit PM ₁₀ -Werten > GW	nr	lv-mot	lv-mot	lv-mot	>lv
DEZDXX0001A	Ballungsraum München	>lv	lv-mot	lv-mot	lv-mot	<lv
DEZDXX0002A	Ballungsraum Augsburg	>lv	<lv	lv-mot	lv-mot	<lv
DEZEIX0107A	Ballungsraum Niedersachsen-Bremen	>lv	<lv	<lv	lv-mot	<lv
DEZJXX0004A	Köln	<lv	<lv	<lv	<lv	<lv
DEZJXX0005A	Hagen	<lv	<lv	<lv	lv-mot	<lv
DEZJXX0006A	Essen	<lv	lv-mot	<lv	>lv	>lv
DEZJXX0008A	Dortmund	<lv	lv-mot	<lv	lv-mot	<lv
DEZJXX0009A	Düsseldorf	>lv	lv-mot	lv-mot	lv-mot	<lv
DEZJXX0011A	Aachen	<lv	lv-mot	<lv	<lv	<lv
DEZJXX0014S	Warstein	nr	<lv	<lv	<lv	<lv
DEZJXX0015A	Grevenbroich (Ballungsraum Rheinisches Braunkohlerevier)	nr	<lv	lv-mot	lv-mot	<lv
DEZJXX0017A	Duisburg	>lv	>lv	lv-mot	lv-mot	>lv
DEZJXX0018S	Krefeld	lv-mot	lv-mot	lv-mot	lv-mot	<lv
DEZNXX0001A	Leipzig	>lv	lv-mot	lv-mot	>lv	>lv
DEZOXX0017S	LSA West	<lv	<lv	lv-mot	lv-mot	<lv

Zone code	zone name	2008	2009	2010	2011	2012
DEZPXX0010S	Gebiet Thüringen 1	>lv	lv-mot	lv-mot	lv-mot	>lv
ES0705	COMARCA DE PUERTOLLANO	>lv	<lv	<lv	>lv	>lv
FR16A02	Strasbourg	>lv	>lv	>lv	>lv	>lv
HU0002	Győr-Mosonmagyaróvár	<lv	<lv	lv-mot	>lv	<lv
HU0003	Komárom-Tatabánya-Esztergom	<lv	lv-mot	lv-mot	>lv	<lv
HU0006	Pécs region	<lv	lv-mot	>lv	>lv	>lv
HU0009	Debrecen region	<lv	<lv	<lv	<lv	<lv
IT0201	Zona di risanamento	<lv	<lv	<lv	<lv	<lv
IT1001	Area metropolitana di Perugia	>lv	lv-mot	<lv	lv-mot	<lv
IT1203	Z2	<lv	<lv	<lv	>lv	>lv
IT1504	Zona di risanamento – area beneventana	>lv	lv-mot	<lv	>lv	>lv
NL0100	Noord	<lv	<lv	<lv	<lv	<lv
NL0230	Den Haag/ Leiden	>lv	lv-mot	<lv	lv-mot	<lv
NL0300	Zuid	>lv	lv-mot	lv-mot	lv-mot	>lv
NL0310	Eindhoven	>lv	<lv	lv-mot	lv-mot	<lv
NL0320	Heerlen/ Kerkrade	<lv	<lv	lv-mot	lv-mot	<lv
PL1404	strefa pruszkowsko-żyrardowska	>lv	lv-mot	>lv	>lv	>lv
PL1403	miasto Radom	>lv	lv-mot	>lv	>lv	>lv
PL1602	strefa namysłowsko-oleska	>lv	>lv	>lv	>lv	>lv
PL1602	powiat kędzierzyńsko-kozielski	>lv	lv-mot	>lv	>lv	>lv
PL3003	strefa ostrowsko-kępińska	<lv	<lv	>lv	>lv	>lv
UK0001	Greater London Urban Area	>lv	>lv	lv-mot	lv-mot	>lv
SKKO02	Košický kraj	>lv	>lv	>lv	>lv	>lv
SKPR01	Prešovský kraj	>lv	>lv	lv-mot	>lv	>lv
SKTN01	Trnavský kraj	>lv	<lv	lv-mot	>lv	<lv
SKTR01	Trenčiansky kraj	>lv	>lv	lv-mot	>lv	>lv

c) both

		PM ₁₀ ALV					and PM ₁₀ DLV				
Zone code	zone name	2008	2009	2010	2011	2012	2008	2009	2010	2011	2012
NL0200	Midden	<lv	<lv	<lv	<lv	<lv	>lv	lv-mot	lv-mot	lv-mot	>lv
NL0210	Amsterdam/ Haarlem	<lv	<lv	<lv	<lv	<lv	>lv	lv-mot	lv-mot	lv-mot	<lv
NL0220	Utrecht	<lv	<lv	<lv	<lv	<lv	>lv	lv-mot	<lv	lv-mot	<lv
NL0240	Rotterdam/ Dordrecht	<lv	<lv	<lv	<lv	<lv	>lv	lv-mot	lv-mot	lv-mot	<lv

d) NO₂ ALV, HLV

		ALV			HLV		
Zone code	zone name	2010	2011	2012	2010	2011	2012
AT_02	Kärnten	>lv	>lv	lv-mot			
AT_03	Niederösterreich	>lv	>lv	<lv			
AT_40	AG Linz	>lv	>lv	lv-mot			
BEF01S	PORT OF ANTWERP	>lv	lv-mot	lv-mot			
BEF02A	ANTWERP	>lv	lv-mot	lv-mot			
BG0001	Sofia	>lv	>lv	lv-mot	>lv	>lv	lv-mot
BG0002	Plovdiv	>lv	>lv	lv-mot	>lv	>lv	<lv
CZ010	Praha				>lv	>lv	<lv
CZ0642	Brno	>lv	>lv	<lv			
	Orte erhöhter			lv-mot			
	verkehrsbedingter						
DEZAXX0006S	Schadstoffbelastung im Land	>lv	>lv				
	Brandenburg ab 2005						
DEZCXX0005A	Ballungsraum Karlsruhe	>lv	>lv	lv-mot			

Zone code	zone name	ALV			HLV		
		2010	2011	2012	2010	2011	2012
DEZCXX0042S	Regierungsbezirk Freiburg (ohne Ballungsraum)	>lv	>lv	lv-mot			
DEZCXX0043S	Regierungsbezirk Tübingen				>lv	>lv	<lv
DEZDXX0025S	Oberpfalz	>lv	>lv	<lv			
DEZDXX0026S	Unterfranken	>lv	>lv	<lv			
DEZEXX0101S	Bremen (Bremerhaven)	>lv	>lv	lv-mot			
DEZFXX0003S	Gebiet I (Südhessen)	>lv	>lv	<lv			
DEZFXX0004S	Gebiet II (Lahn-Dill-Gebiet)	>lv	>lv	lv-mot			
DEZGLX0001A	Ballungsraum Hamburg				>lv	<lv	<lv
DEZHXX0003A	Ballungsraum Rostock	>lv	>lv	lv-mot			
DEZIXX0103S	Niedersachsen-Sued	>lv	>lv	lv-mot			
DEZIXX0104A	Ballungsraum Hannover-Braunschweig	>lv	>lv	lv-mot			
DEZIXX0105A	Ballungsraum Osnabrueck	>lv	>lv	>lv			
DEZIXX0106A	Ballungsraum Goettingen	>lv	<lv	<lv			
DEZJXX0018S	Krefeld	>lv	>lv	lv-mot			
DEZLXX0001A	Ballungsraum Kiel	>lv	>lv	>lv			
DEZLXX0005S	Itzehoe	>lv	>lv	lv-mot			
DEZLXX0006S	Ratzeburg	>lv	>lv	lv-mot			
DEZMXX0001A	Ballungsraum Saarbrücken (BSB)	>lv	>lv	lv-mot			
DEZNXX0001A	Leipzig	>lv	>lv	lv-mot			
DEZNXX0002A	Dresden	>lv	>lv	lv-mot			
DEZNXX0015A	Ballungsraum Chemnitz	>lv	>lv	>lv			
DEZOXX0002A	Halle	>lv	>lv	lv-mot			
DEZOXX0015A	Landeshauptstadt Magdeburg	>lv	>lv	lv-mot			
DEZPXX0011S	Gebiet Thüringen 2	>lv	>lv	lv-mot			
ES0118	GRANADA Y ÁREA METROPOLITANA	>lv	>lv	lv-mot			
ES1308	CORREDOR DEL HENARES	>lv	>lv	lv-mot			
ES1309	URBANA SUR	>lv	>lv	lv-mot			
FI0014	Pääkaupunkiseutu (HSY-alue)	>lv	lv-mot	lv-mot			
UK(GIB)	Gibraltar	>lv	lv-mot	lv-mot			
UK0008	Nottingham Urban Area	>lv	>lv	lv-mot			
UK0011	Leicester Urban Area	>lv	>lv	>lv			
UK0012	Portsmouth Urban Area	>lv	>lv	>lv			
UK0015	Bournemouth Urban Area	>lv	>lv	>lv			
UK0016	Reading/Wokingham Urban Area	>lv	lv-mot	>lv			
UK0017	Coventry/Bedworth	>lv	>lv	lv-mot			
UK0021	Southend Urban Area	>lv	lv-mot	>lv			
UK0025	Edinburgh Urban Area	>lv	lv-mot	lv-mot			
UK0026	Cardiff Urban Area	>lv	lv-mot	lv-mot			
UK0037	Central Scotland	>lv	lv-mot	>lv			
UK0042	North Wales	>lv	>lv	lv-mot			
UK0043	Northern Ireland	>lv	>lv	>lv			
IT0104	Vercelli 01	>lv	>lv	<lv			
IT0110	Asti 01	>lv	>lv	<lv			
IT0112	Alessandria 01	>lv	>lv	lv-mot			
IT0114	Biella 01	>lv	<lv	lv-mot			
IT0309	Pianura ad elevata urbanizzazione (A)	>lv	>lv	<lv			
IT0310	Pianura (B)	>lv	<lv	<lv			

Zone code	zone name	ALV			HLV		
		2010	2011	2012	2010	2011	2012
IT0401	Zona A	>lv	lv-mot	lv-mot			
IT0501	Zona 1 Agglomerato: Agglomerato Venezia-Treviso	>lv	>lv	lv-mot			
IT0502	Zona 1 Agglomerato: Agglomerato Padova	>lv	lv-mot	lv-mot			
IT0503	Zona 1 Agglomerato: Agglomerato Vicenza	>lv	lv-mot	lv-mot			
IT0703	Aree urbane con fonti emittenti miste -La Spezia -	>lv	lv-mot	lv-mot			
IT0705	Aree urbane in cui prevale la fonte produttiva-Bormida-	>lv	>lv	lv-mot			
IT0706	Aree urbane in cui prevale la fonte produttiva-Busalla-	>lv	lv-mot	<lv			
IT0802	Agglomerato R1 Piacenza	>lv	>lv	lv-mot			
IT0812	Agglomerato R2 Parma	>lv	>lv	lv-mot			
IT0822	Agglomerato R3 Reggio Emilia	>lv	>lv	lv-mot			
IT0833	Agglomerato R5 Fiorano Modenese	>lv	>lv	lv-mot			
IT0852	Agglomerato R8 Ferrara	>lv	>lv	lv-mot			
IT0882	Agglomerato R13 Rimini	>lv	<lv	lv-mot			
IT1203	Z2	>lv	lv-mot	>lv			
IT1502	ZONA DI RISANAMENTO - AREA SALERNITANA	>lv	<lv	lv-mot			
IT1503	ZONA DI RISANAMENTO - AREA AVELLINESE	>lv	<lv	<lv			
IT1603	C (aree urbano-industriali)	>lv	>lv	<lv			
LV0001	Riga	>lv	>lv	lv-mot			
NL0100	Noord	lv-mot	lv-mot	lv-mot			
NL0200	Midden	lv-mot	lv-mot	lv-mot			
NL0210	Amsterdam/Haarlem	lv-mot	lv-mot	lv-mot			
NL0220	Utrecht	lv-mot	lv-mot	lv-mot			
NL0230	Den Haag/ Leiden	lv-mot	lv-mot	lv-mot			
NL0240	Rotterdam/ Dordrecht	lv-mot	lv-mot	lv-mot			
NL0300	Zuid	lv-mot	lv-mot	lv-mot			
NL0310	Eindhoven	lv-mot	lv-mot	lv-mot			
NL0320	Heerlen/ Kerkrade	lv-mot	lv-mot	<lv			
PT3001	Área Metropolitana de Lisboa Norte				>lv	<lv	<lv

Reporting of exceedances of the PM₁₀ limit values attributable to natural sources

Subtraction of exceedances attributable to natural sources is possible for PM₁₀ and SO₂ by means of the forms 21 and 23. None of the reporting countries informed on SO₂ events.

Subtractions for PM₁₀ are applied by a number of reporting countries. In addition to contributions from sea salt, the natural events affecting measured concentrations were mainly described as: “wild-land fire inside the Member State”, “high wind events inside the Member State” and “transport of natural particles from dry regions outside the Member State”. The latter contribution is particularly important in the Mediterranean Member States. Not in all cases a justification for the subtraction for natural events has been given; see Viana et al. (2011) for a further discussion on the reporting on natural events.

Subtractions regarding exceedances of the PM₁₀ daily limit value have been claimed at 90 stations in 52 zones. The reduction in the number of exceedance days varies from zero up to 67 days (station CY0004A) with an average of 11 days per station. In 19 zones the subtraction resulted in a change in the attainment status in relation to the daily limit value; for the other zones the number of exceedance days at one or more monitoring stations after subtraction was still above the allowable 35 days.

Three zones changed their attainment status in relation to the annual limit value. Table 4 lists the zones where after subtraction of the natural contributions the air quality assessments changed from “above limit value” to “below limit value”.

Table 4. Subtraction of natural contributions to the annual mean concentrations or to concentrations during exceedances days may result in concentrations which are below the annual or daily limit value. The air quality assessment in the following zones changes from “above limit value” to “below limit value” by subtraction of the natural contribution.

daily limit value			annual limit value		
MS	Zone code	Zone	MS	Zone code	Zone
CY	CY001A	CYPRUS	CY	CY001A	CYPRUS
EL	EL0003	Οικισμός Αθήνα	EL	EL0004	Οικισμός Θεσσαλονίκη
ES	ES0108	ZONA INDUSTRIAL DE BAILÉN	MT	MT0001	Maltese Agglomeration
ES	ES0111	CÓRDOBA			
ES	ES0118	GRANADA Y ÁREA METROPOLITANA			
ES	ES0119	MÁLAGA Y COSTA DEL SOL			
ES	ES0122	NUEVA ZONA DE NÚCLEOS DE 50.000 A 250.000 HABITANTES			
ES	ES0125	NUEVA ZONA SEVILLA Y ÁREA METROPOLITANA			
ES	ES0504	FUERTEVENTURA Y LANZAROTE			
ES	ES0510	SUR DE GRAN CANARIA			
ES	ES0513	SUR DE TENERIFE			
ES	ES0705	COMARCA DE PUERTOLLANO			
ES	ES1003	MIJARES-PEÑAGOLOSA . ÁREA COSTERA			
FR	FR02N30	PROVENCE-ALPES-COTE-D-AZUR-ZI			
FR	FR18N10	PICARDIE-ZUR			
FR	FR38N10	REUNION-ZUR			
MT	MT0001	Maltese Agglomeration			
SI	SI4	Sredozemsko			
GB	UK0001	Greater London Urban Area			

Contribution of winter-sanding and -salting

Five countries (Germany, France, Italy, Latvia and Romania) applied for subtractions due to winter sanding on PM₁₀ exceedances in Form 24. However, after the subtraction the number of exceedances dropped below the allowed number only in one Romanian zone (RO22301, Constanta); in this zone the air quality assessment changed from “above limit value” to “below limit value”.

4. Conclusions

The number of designated zones in 2012 in the EU-27 (765) was lower than in 2011 (811). The designation of zones for pollutants having a health related limit or target value is completed for SO₂, NO₂, PM₁₀, CO and ozone. For these compounds, the zones cover 90% or more of the population; exceptions are found in Romania where the population coverage may drop to around 80%. For PM_{2.5} an incomplete zoning (population coverage below 90 %) is found in France, Greece, Italy, Romania and Slovakia. For lead and benzene, the coverage is also incomplete: in a number of Member States the zones cover less than 80% of the population: Estonia for benzene; Italy for lead and Romania for both pollutants. Germany, France, Greece, Hungary, Italy, Portugal, Romania, and Slovakia have different zone designations for PM₁₀ and PM_{2.5}.

In 2012, the percentage of zones in all reporting countries exceeding the limit values set for the protection of human health was highest for the NO₂ annual limit value and the daily limit value of PM₁₀ (percentages were 30% and 29%, respectively). The health-related target value of O₃ has been exceeded in a slightly larger fraction (34%). Compared to 2011 the fraction of zones in exceedance of PM₁₀ LV is this year lower; for the NO₂-annual limit value and ozone target value similar fraction were found in both years.

Looking at the population, the highest fraction potentially exposed to levels above the LV or TV is found for the annual LV of NO₂ (46%), next the daily LV of PM₁₀ (38%), followed by the O₃ TV (35%).

For a limited number of designated zones no information on the attainment situation has been reported (see the yellow areas in the maps). This is particularly the case for Italy where attainment information for 3-10 zones is missing for health-related LV or TV. For a few pollutants attainment information is missing for zones in Portugal and Slovakia.

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Annex I: List of forms in AQ questionnaire

Form 0	General information, update history
Form 1	Contact body and address
Form 2	Delimitation of zones and agglomerations
Form 3	Stations and measuring methods used for assessment under first, second and fourth DD
Form 4	Stations used for assessment of ozone, including nitrogen dioxide and nitrogen oxides in relation to ozone
Form 5a-5c	Stations and measuring methods used for the assessment of recommended volatile organic compounds, other relevant PAH in ambient air and of concentration and deposition of arsenic, cadmium, mercury, nickel, B(a)P and other relevant PAH at background locations.
Form 6	Stations and measurement methods used for the assessment of other ozone precursor substances
Form 7	Methods used to sample, measure and analyse PM ₁₀ and PM _{2.5} , ozone precursor substances, arsenic, cadmium, nickel, mercury, PAH: optional additional codes to be defined by the Member State
Form 8a-8g	List of zones and agglomerations where levels exceed or do not exceed limit values or limit values plus margin of tolerance for SO ₂ , NO ₂ , NO _x , PM ₁₀ , lead, benzene, CO and PM _{2.5}
Form 9a-9c	List of zones and agglomerations where levels exceed or do not exceed target values or long term objectives for ozone, target values for arsenic, cadmium, nickel and B(a)P and target values for PM _{2.5}
Form 10a-10l	List of zones and agglomerations where levels exceed or do not exceed upper assessment thresholds or lower assessment thresholds, including information on the application of supplementary assessment methods
Form 11a-11m	Individual exceedances of limit values and limit values plus the margin of tolerance of SO ₂ , NO ₂ , NO _x , PM ₁₀ , lead, benzene, CO and PM _{2.5}
Form 12	Reasons for individual exceedances: optional additional codes to be defined by the Member State
Form 13a-13c	Individual exceedances of ozone information and alert thresholds and of the long term objective for health protection
Form 14a-14d	Exceedance of target values of ozone, arsenic, cadmium, nickel, benzo(a)pyrene and PM _{2.5}
Form 15a-15b	Annual statistics of ozone, arsenic, cadmium, nickel, and benzo(a)pyrene
Form 16a-16d	Annual average concentrations of ozone precursor substances, of mercury and relevant PAH compounds other than B(a)P, and total deposition of arsenic, cadmium, nickel, mercury and relevant PAH compounds other than B(a)P
Form 17	Monitoring data on 10 minutes mean SO ₂ levels
Form 18	Monitoring data on 24hr mean PM _{2.5} levels
Form 19a-19l	Tabular results of and methods used for supplementary assessment
Form 20	List of references to supplementary assessment methods referred to in Form 19
Form 21a-21d	Exceedance of limit values for SO ₂ due to natural sources
Form 22	Natural SO ₂ sources: optional additional codes to be defined by Member State
Form 23a-23b	Exceedance of limit values of PM ₁₀ due to natural events or contributions
Form 24a-24b	Exceedance of limit values of PM ₁₀ due to winter sanding or salting
Form 25	Consultations with other MS on transboundary pollution
Form 26	Exceedances of limit values laid down in Directive 85/203/EEC
Form 27	Reasons for exceedances of limit values laid down in Directive 85/203/EEC: optional additional codes to be defined by the Member State
Form 28	PM _{2.5} Average Exposure Indicator

Annex II. Air Quality Standards

Under EU Directives a limit value is legally binding from the date it enters into force subject to any exceedances permitted by the legislation. A target value is to be attained as far as possible by the attainment date. The table below shows the EU air quality standards set for the protection of human health. More details can be found at <http://ec.europa.eu/environment/air/quality/standards.htm>.

Pollutant	Concentration	Averaging period	Legal nature*	Permitted exceedances each year
Fine particles (PM _{2.5})	25 µg/m ³	1 year	Target value Limit value enters into force 1.1.2015**	n/a
	20 µg/m ³	1 year	Indicative limit value enters into force 1.1.2020 (to be confirmed)	
Sulphur dioxide (SO ₂)	350 µg/m ³	1 hour	Limit value	24
	125 µg/m ³	24 hours	Limit value	3
Nitrogen dioxide (NO ₂)	200 µg/m ³	1 hour	Limit value ***	18
	40 µg/m ³	1 year	Limit value ***	n/a
PM ₁₀	50 µg/m ³	24 hours	Limit value	35
	40 µg/m ³	1 year	Limit value	n/a
Lead (Pb)	0.5 µg/ m ³	1 year	Limit value	n/a
Carbon monoxide (CO)	10 mg/ m ³	Maximum daily 8 hour mean	Limit value	n/a
Benzene	5 µg/ m ³	1 year	Limit value ***	n/a
Ozone	120 µg/ m ³	Maximum daily 8 hour mean	Target value	25 days averaged over 3 years
			Long term objective ****	n/a
Arsenic (As)	6 ng/ m ³	1 year	Target value	n/a
Cadmium (Cd)	5 ng/ m ³	1 year	Target value	n/a
Nickel (Ni)	20 ng/ m ³	1 year	Target value	n/a
Benzo(a)pyrene	1 ng/ m ³	1 year	Target value	n/a

* Limit and target values are in force by 31-12-2012 unless indicated.

** Margin of tolerance: 20 % on 11 June 2008, decreasing on the next 1 January and every 12 months thereafter by equal annual percentages to reach 0 % by 1 January 2015

*** Under the Directive 2008/50/EC the Member State can apply for a postponement of up to five years (i.e. maximum up to 2015) in a specific zone. Request is subject to assessment by the European Commission. In such cases within the time extension period the limit value applies at the level of the limit value plus maximum margin of tolerance (18 hours at 300 µg/m³ for the hourly NO₂ limit value, 60 µg/m³ for annual NO₂ limit value and 10 µg/m³ for the benzene limit value).

**** Date by which the long term objective should be met has not been defined.

The Air Quality Directive has introduced additional PM_{2.5} objectives targeting the **exposure** of the population to fine particles. These objectives are set at the national level and are based on the average exposure indicator (AEI).

AEI is determined as a 3-year running annual mean PM_{2.5} concentration averaged over the selected monitoring stations in agglomerations and larger urban areas, set in urban background locations to best assess the PM_{2.5} exposure to the general population.

Title	Metric	Averaging period	Legal nature	Permitted exceedances each year
PM _{2.5} Exposure concentration obligation	20 µg/m ³ (AEI)	Based on 3 year average	Legally binding in 2015 (years 2013,2014,2015)	n/a
PM _{2.5} Exposure reduction target	Percentage reduction* + all measures to reach 18 µg/m ³ (AEI)	Based on 3 year average	Reduction to be attained where possible in 2020, determined on the basis of the value of exposure indicator in 2010	n/a

* Depending on the value of AEI in 2010, a percentage reduction requirement (0, 10, 15, or 20%) is set in the Directive. If AEI in 2010 is assessed to be over 22 µg/m³, all appropriate measures need to be taken to achieve 18 µg/m³ by 2020

AQ objectives set for the protection of vegetation:

Title	Metric	Averaging period	Legal nature
SO ₂	20 µg/m ³	Calendar year and winter (1 October to 31 March)	Critical levels. In force
NO _x	30 µg NO _x /m ³	Calendar year	Critical level. In force
O ₃	AOT40 18000 (µg/m ³).h	May to July averaged over 5 years	Target value to be met by 1-1-2010 (2010 will be the first year in the five years row)
	AOT40 6000 (µg/m ³).h	May to July	Long term objective (Date by which the LTO should be met is not defined)

Annex III. Exceedance maps

This section shows exceedance maps for all AQ objectives, except for the PM₁₀ daily limit value, PM_{2.5} annual limit value, O₃ health target value, NO₂ annual limit value and B(a)P annual target value, which have been included in Figures 3 to 7 in Chapter 3.

The white areas in the maps represent areas in reporting countries that were not designated into zones. The yellow areas were designated into zones, but air quality status was not reported on. For health related objectives in both cases Member States did not comply with the Directives as zoning and reporting is mandatory.

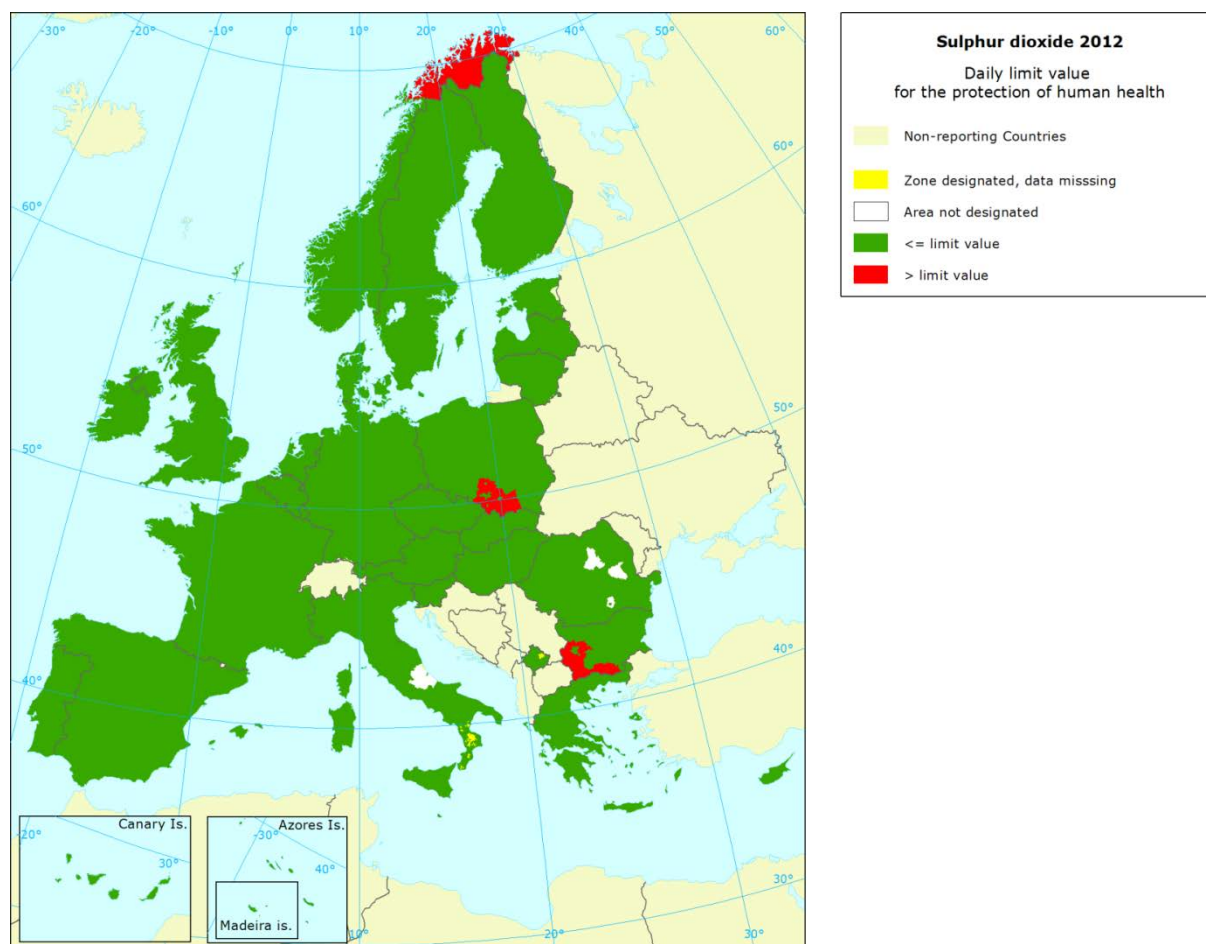


Figure III.1. Zones in exceedance for the daily limit value for SO₂ in 2012.

Like in 2011 zone exceedances for the daily limit value for SO₂ occurred sporadically in Bulgaria, Poland and Norway. The exceedances in Norway are likely caused by transport from the industrial region around Murmansk. In 2012, no more exceedances have been reported in Spain. Exceedances are again reported by Poland after no occurrence in 2011.

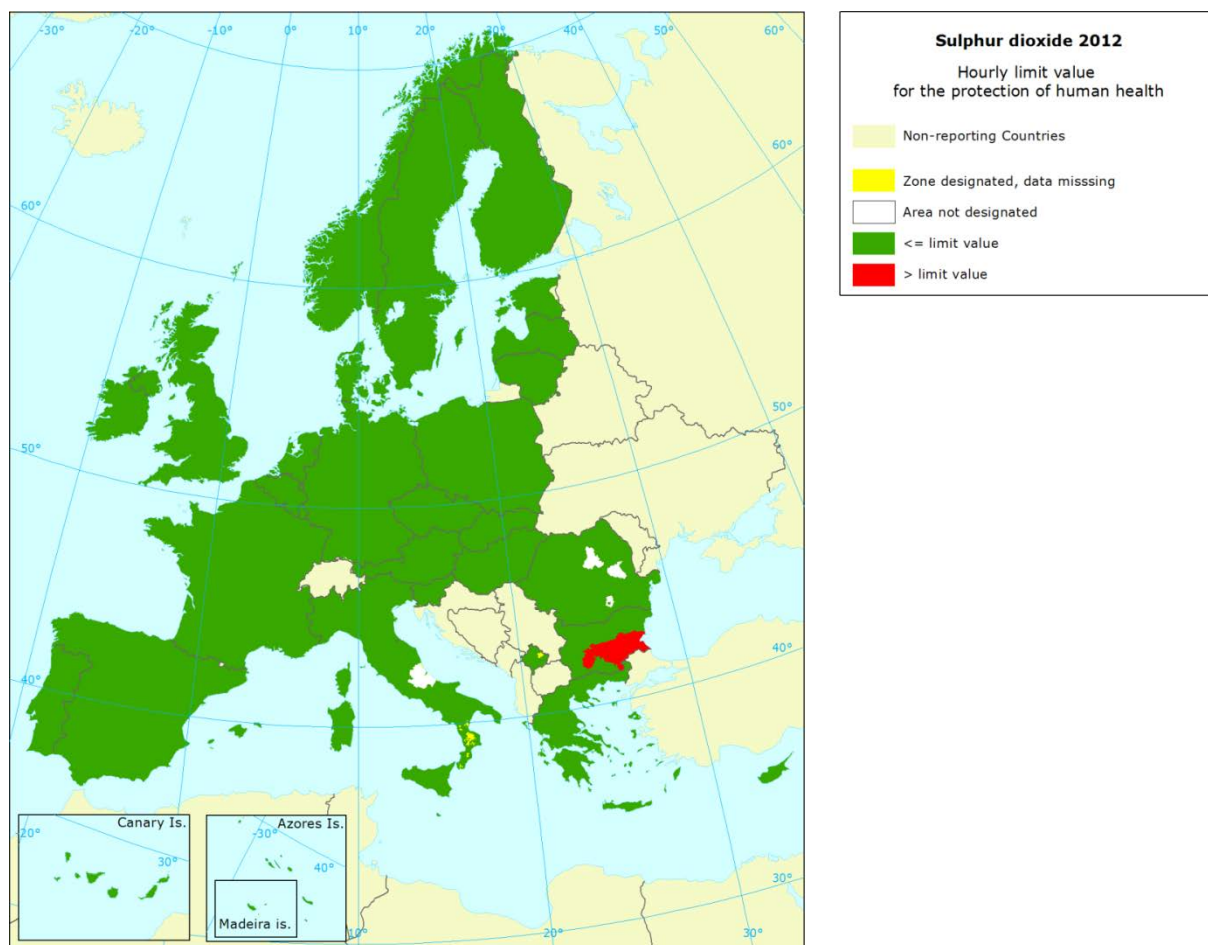


Figure III.2. Zones in exceedance for the hourly limit value for SO₂ in 2012

The map for the hourly limit value of SO₂ shows one zone in Bulgaria in exceedance. Compared to the situation in 2011, the exceedances in Italy and Norway have not occurred.

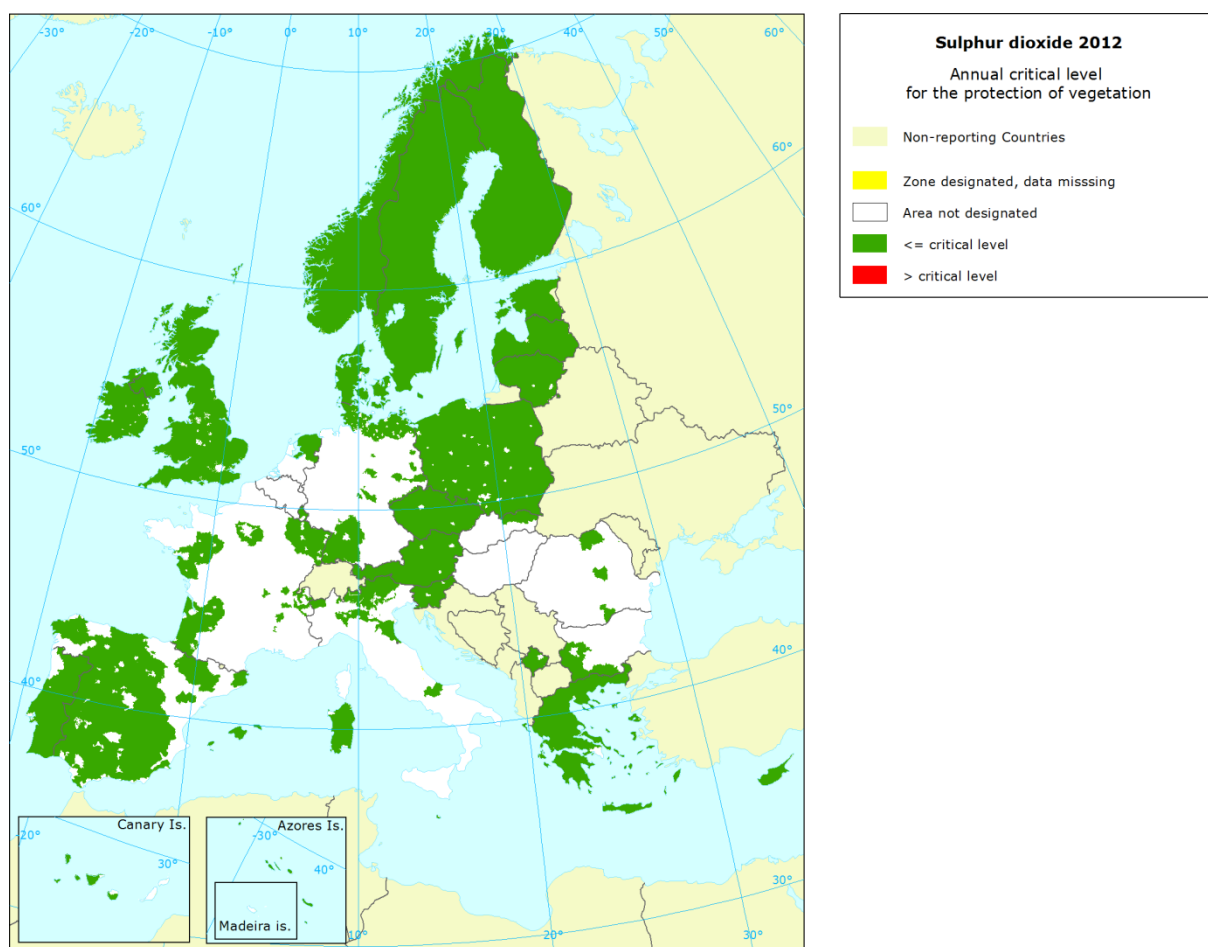


Figure III.3. Zones in exceedance for the annual critical level for SO₂ set for the protection of vegetation in 2012.

No zone exceedance for the annual critical level (CL) for SO₂ for protection of vegetation occurred in 2012.

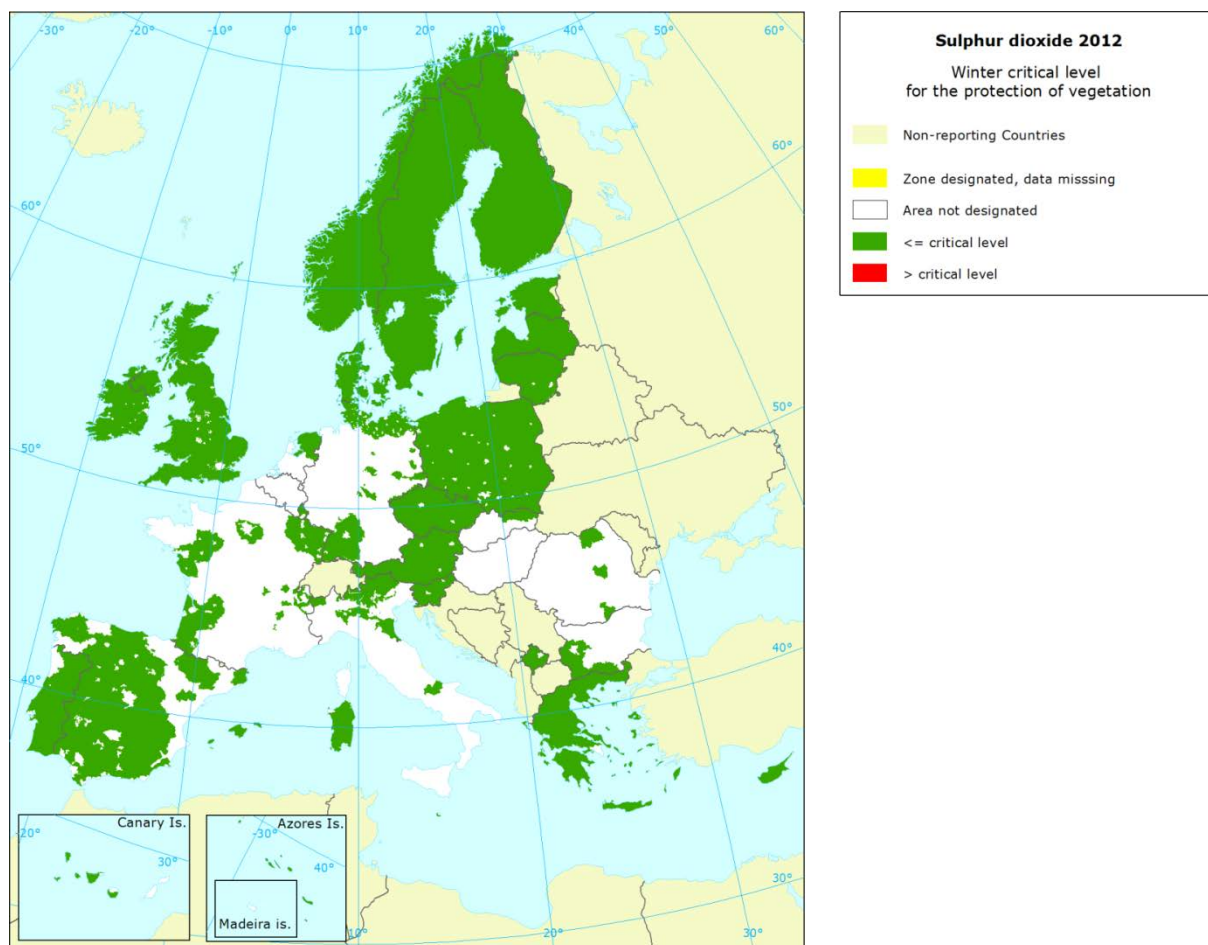


Figure III.4. Zones in exceedance for the winter critical level for SO_2 set for the protection of vegetation in 2012.

No zone exceedance for the winter critical level for SO_2 for protection of vegetation occurred in 2011. The exceedance of the SO_2 winter CL, observed in 2011 in Norway, does not appear in 2012 anymore.

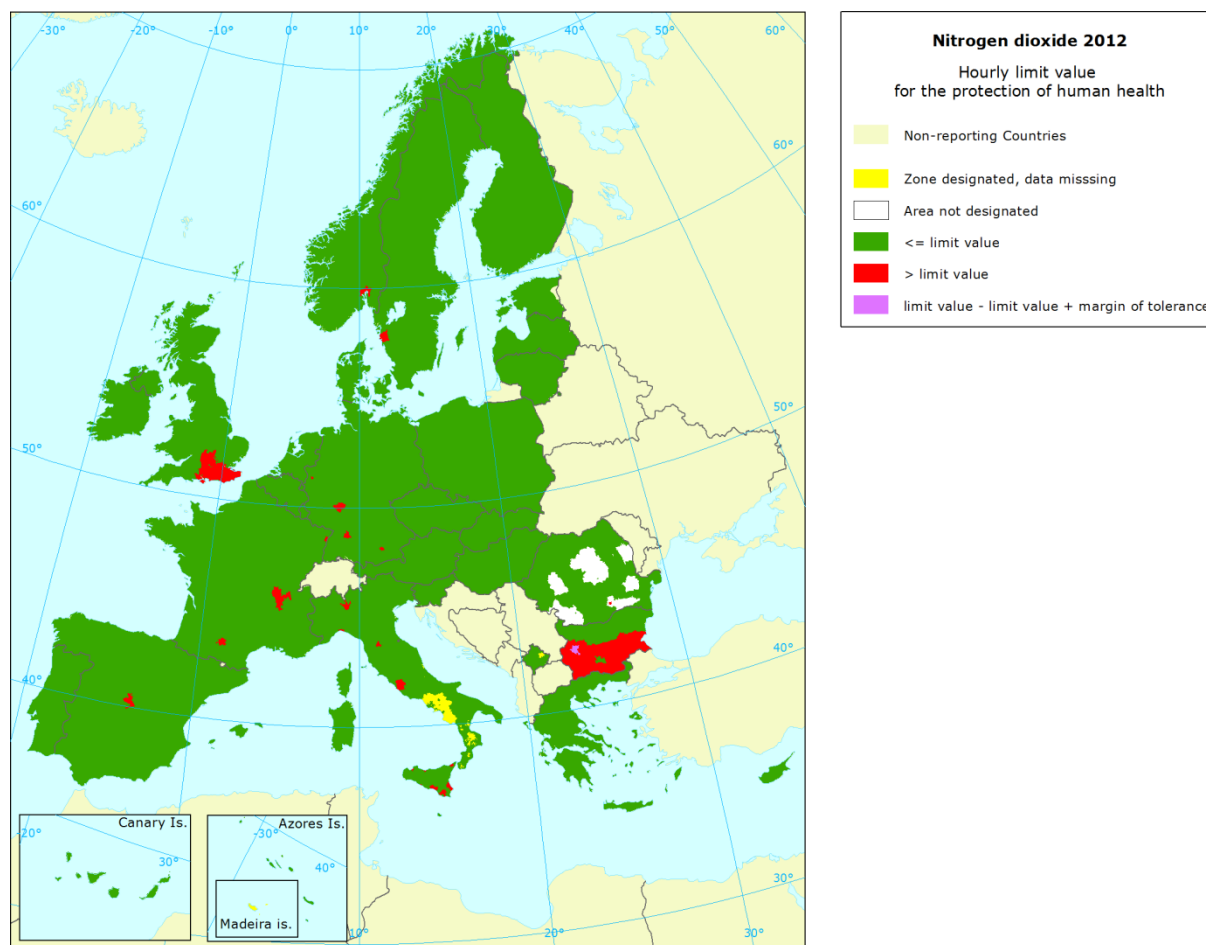


Figure III.5. Zones in exceedance for the hourly limit value for NO₂ in 2012.

Exceedance of the hourly limit value for NO₂ has been reported for 21 zones in EU27 (in 2012: 25, in 2010: 21 zones). Italy has 5 zones in exceedance of the limit value and for 5 designated zones data are missing. Further exceedances of the limit value are observed in Germany (4), France (3), Spain and United Kingdom (both 2), Bulgaria (2) Romania and Sweden (both 1). Norway has 1 zone in exceedance.

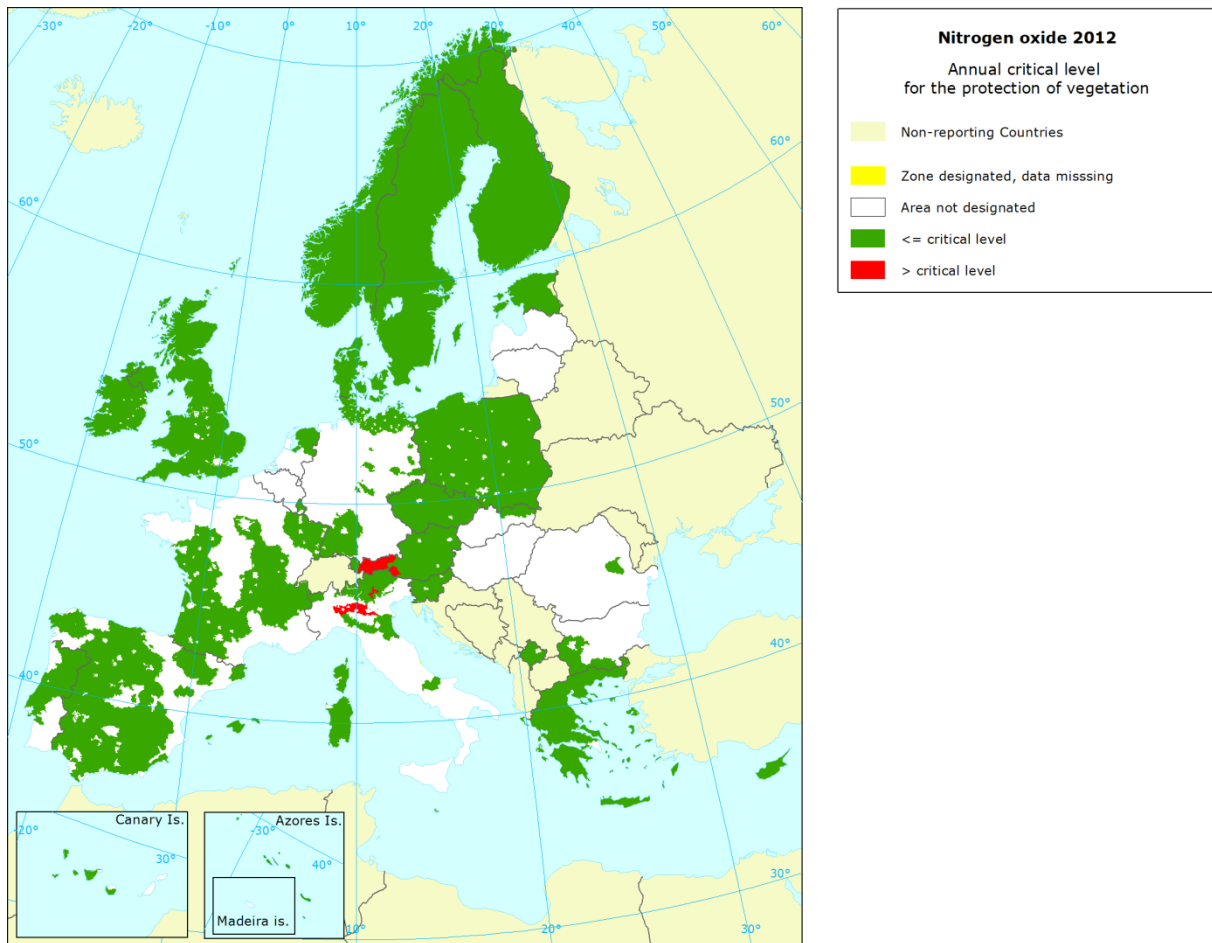


Figure III.6. Zones in exceedance for the critical level for NO_x set for the protection of vegetation in 2012.

As was the case for 2010 and in 2011, for 2012 Austria and Italy reported exceedances of the critical level of NO_x set for the protection of vegetation ($30 \mu\text{g}/\text{m}^3/\text{year}$). In Italy, however, the number of zones in exceedance decreased from 4 to 2 when comparing 2011 with 2012. The zone in exceedance in 2011 in France is not in exceedance in 2012 anymore.

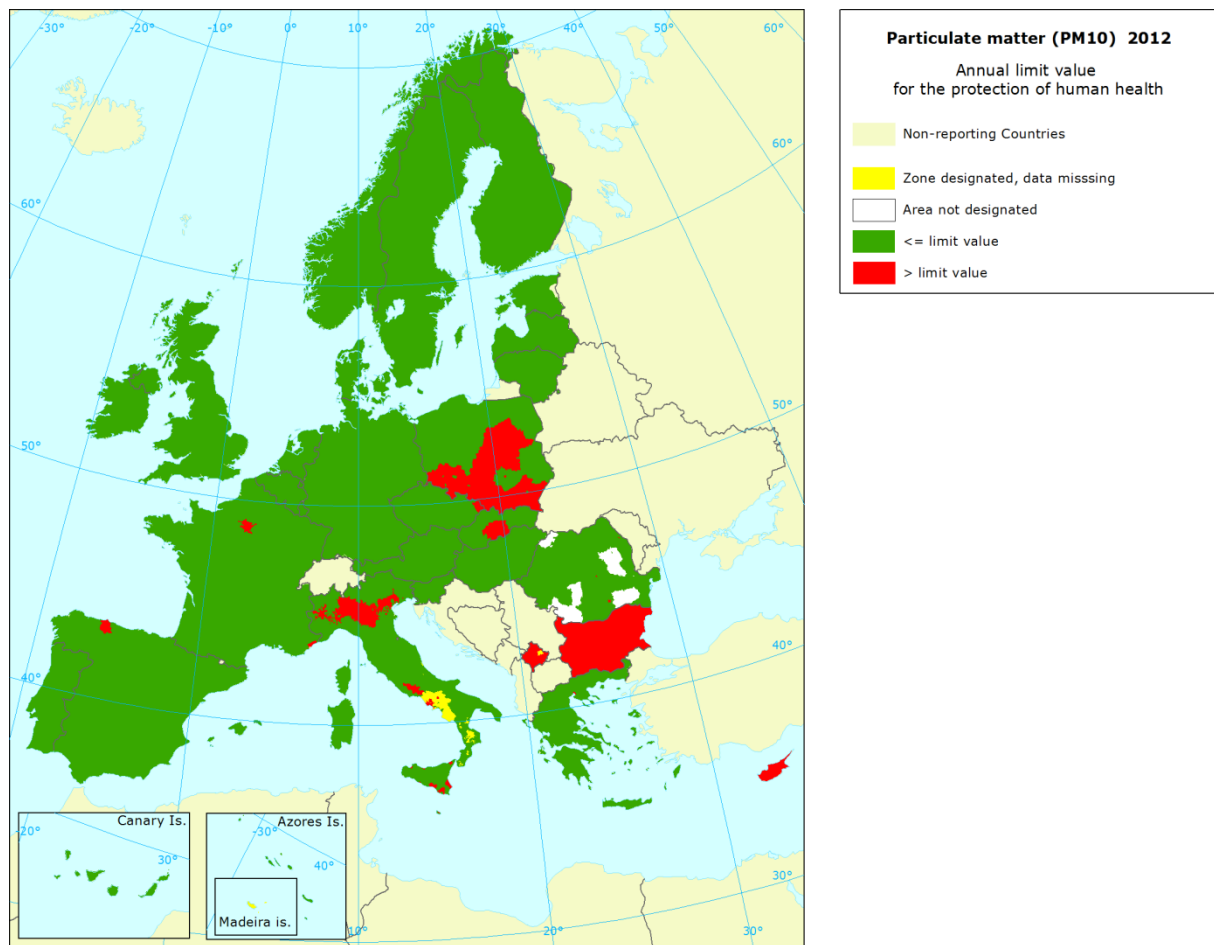


Figure III.7. Zones in exceedance for the annual limit value for PM₁₀ in 2012.

Note that the map does not account for subtractions of natural contributions and/or of contributions of winter-sanding and salting, (see section 3.4).

Most zones in exceedance of the annual LV of PM₁₀ occur in Poland (18) and Italy (17). Bulgaria and Cyprus have all designated zones exceeding the LV.

For the annual limit value of PM₁₀ the most mentioned single reason of exceedance is local traffic.

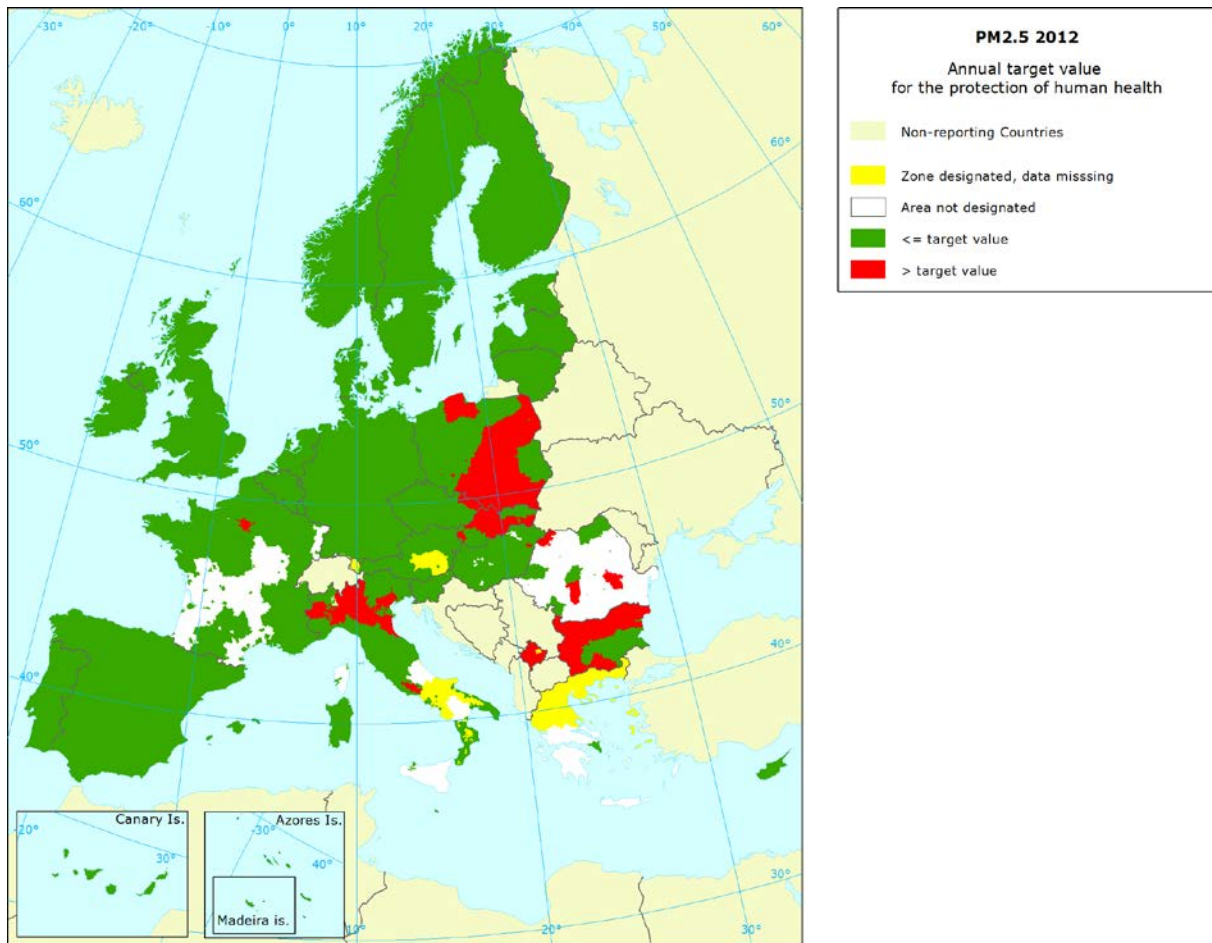


Figure III.8. Zones in exceedance for the annual target value for PM_{2.5} in 2012.

Most zones in exceedance of the annual TV of PM_{2.5} occur in Italy (21) and Poland (25). In 2011 Greece and Slovakia had most of their designated zones exceeding the TV, but in 2012 the TV exceedances have dropped from 8 to 3 in Slovakia and to none in Greece.

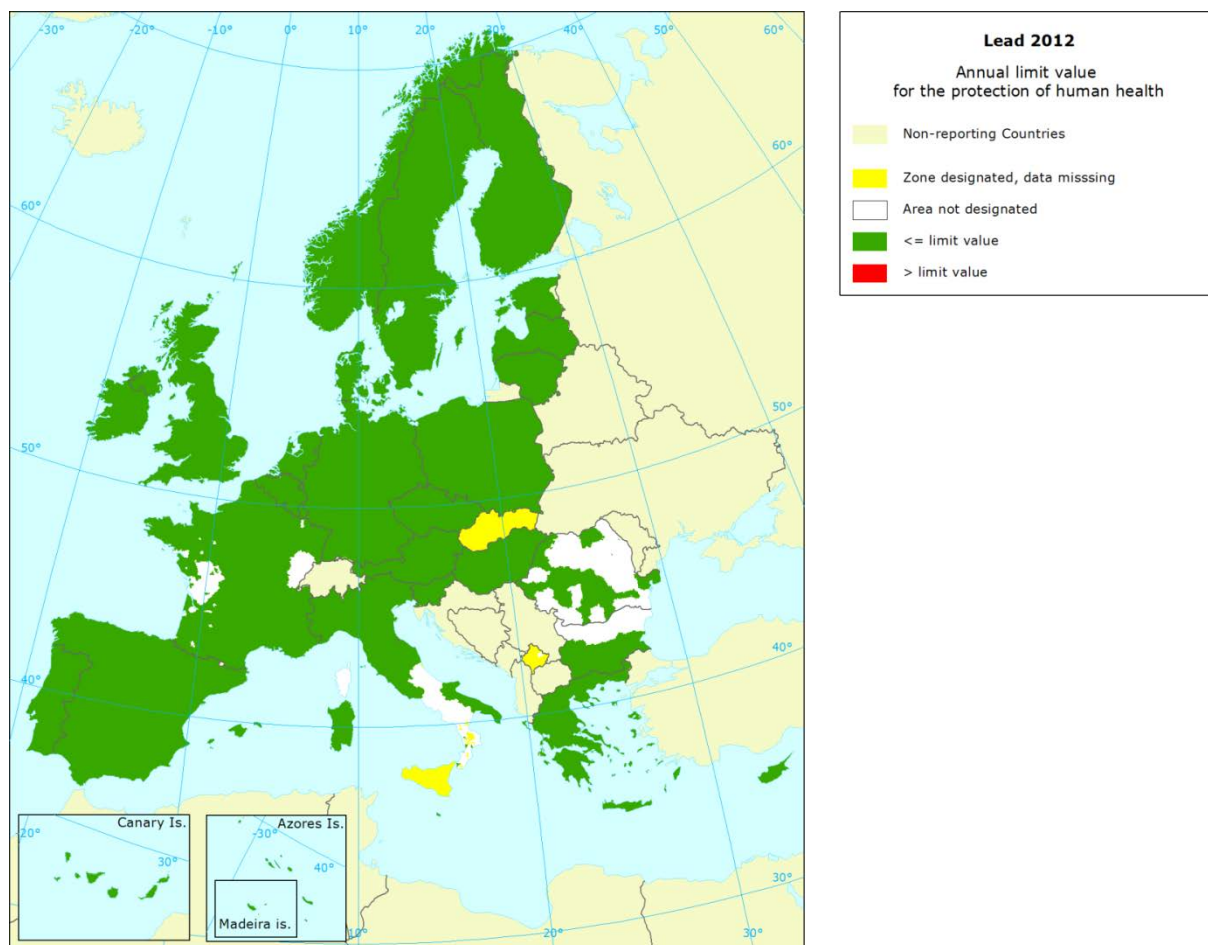


Figure III.9: Zones in exceedance for the annual limit value for lead in 2012.

There are no more zones reporting exceedance of the limit value for lead. Compared to 2011 the exceedance in one zone in Bulgaria has disappeared.

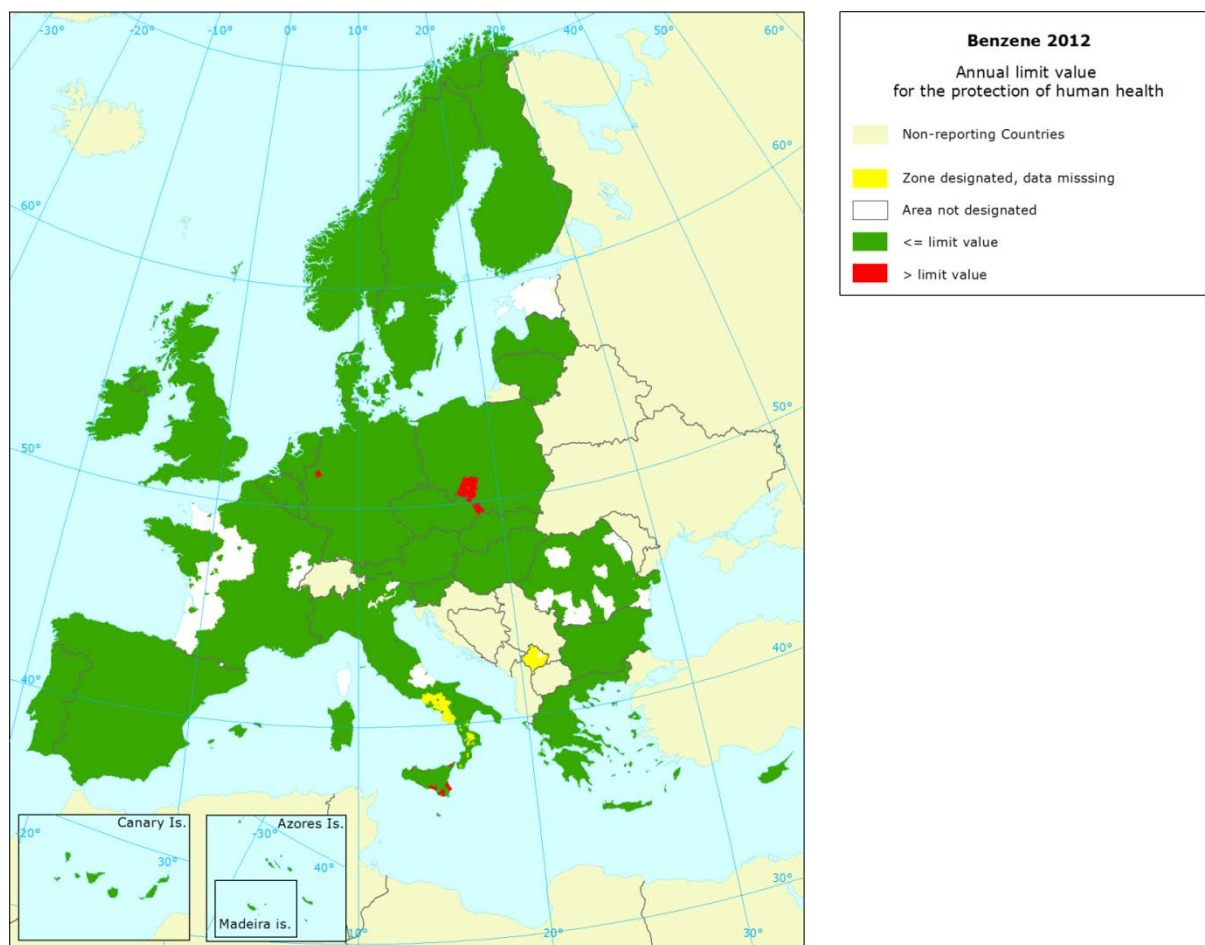


Figure III.10: Zones in exceedance for the annual limit value for benzene in 2012.

The Czech Republic (1), Germany (1), Italy (1) and Poland (1) reported in total 4 zones exceeding the limit value of $5 \mu\text{g}/\text{m}^3$. In 2011 the Czech Republic, Italy and Poland reported exceedances in four zones. The exceedance situations concern less than 1% of the population in the EU27 (less than 0.5% of the area).

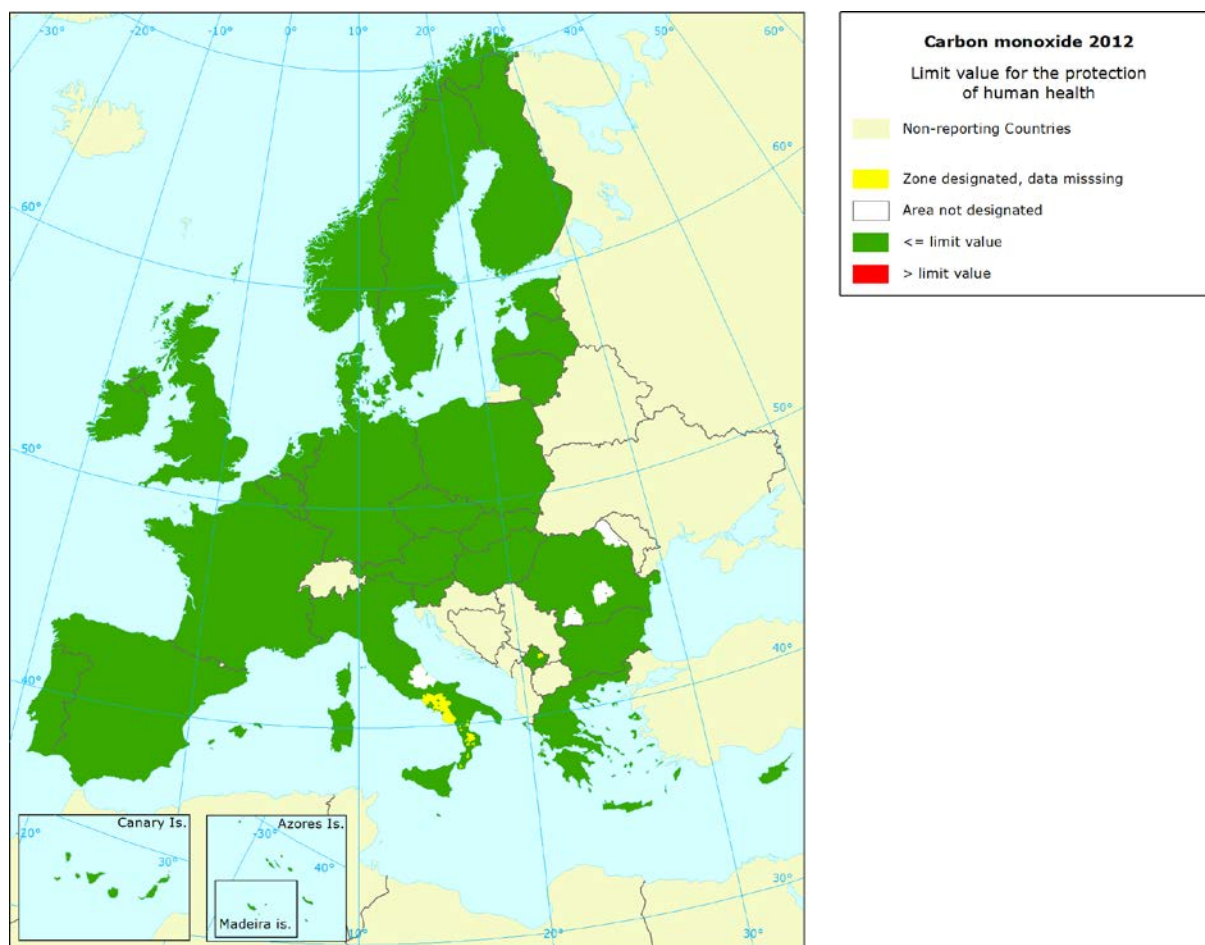


Figure III.11: Zones in exceedance for the annual limit value for CO in 2012.

Information on the situation with respect to CO is still incomplete in Italy. No exceedance has been registered in any of the reported zones.

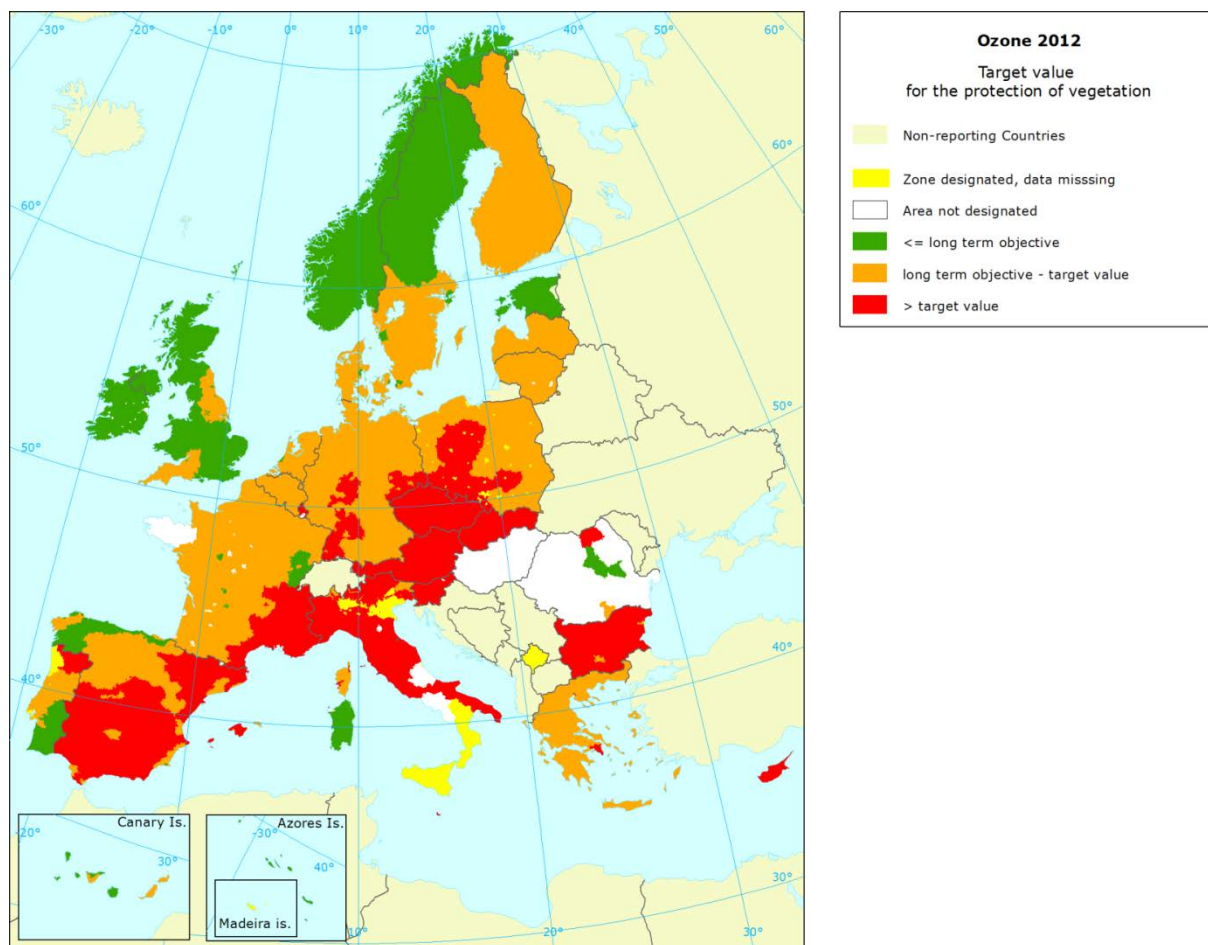


Figure III.12: Zones in exceedance for the vegetation target value for O_3 in 2012.

Most zones in exceedance of TV occur in Spain (56), Italy (45), France (14), Austria (11) and the Czech Republic (10). Austria, Bulgaria, Cyprus, the Czech Republic, Italy, Luxembourg, Malta, Slovenia and Slovakia have all or nearly all of the reported zones exceeding the TV.

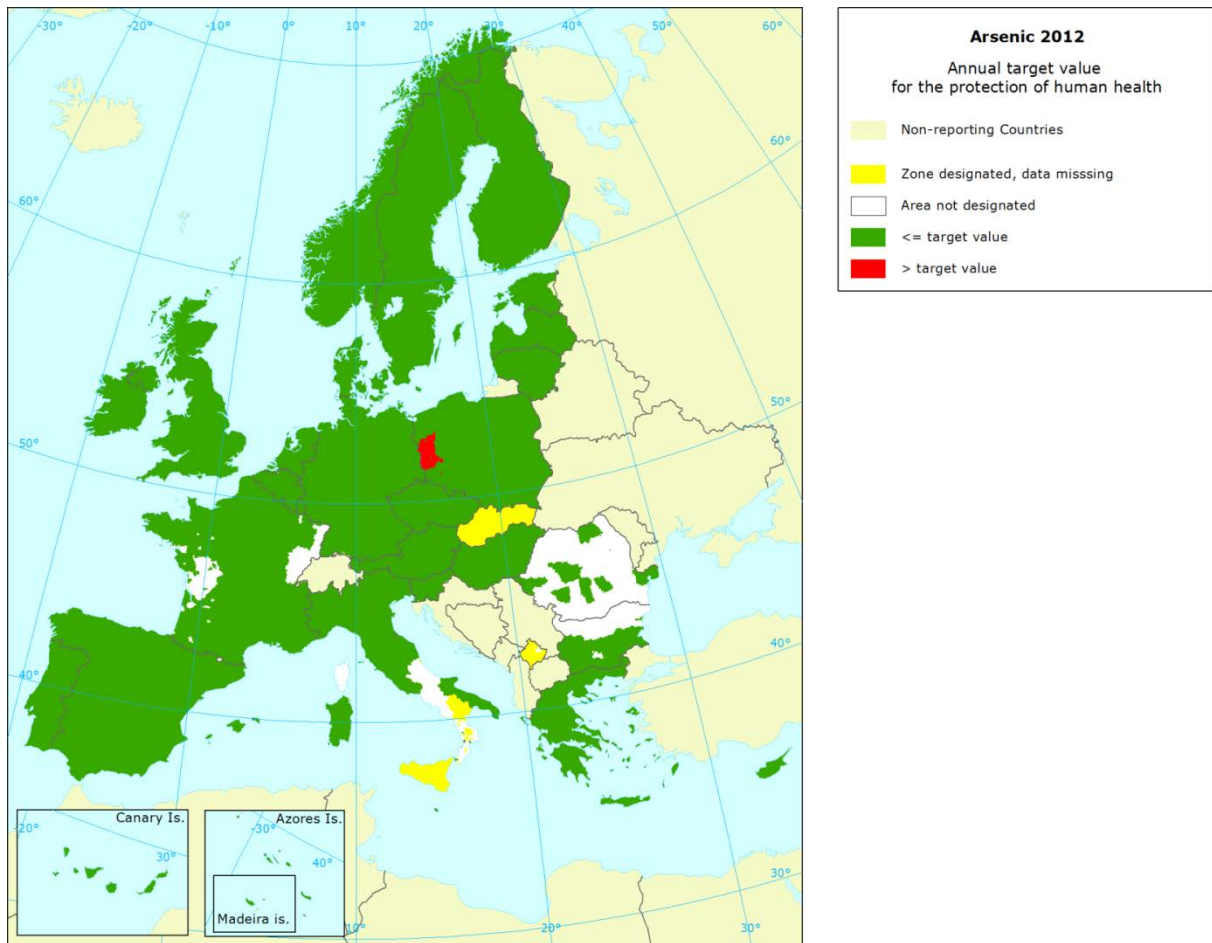


Figure III.13: Zones in exceedance for the target value for arsenic in 2012.

In 3 zones in Belgium (1) and Poland (2) the target value of arsenic has been exceeded in 2012. Zones that reported exceedances for 2011 in Bulgaria, the Czech Republic, Germany, Finland and Italy have not been reporting exceedances for 2012.

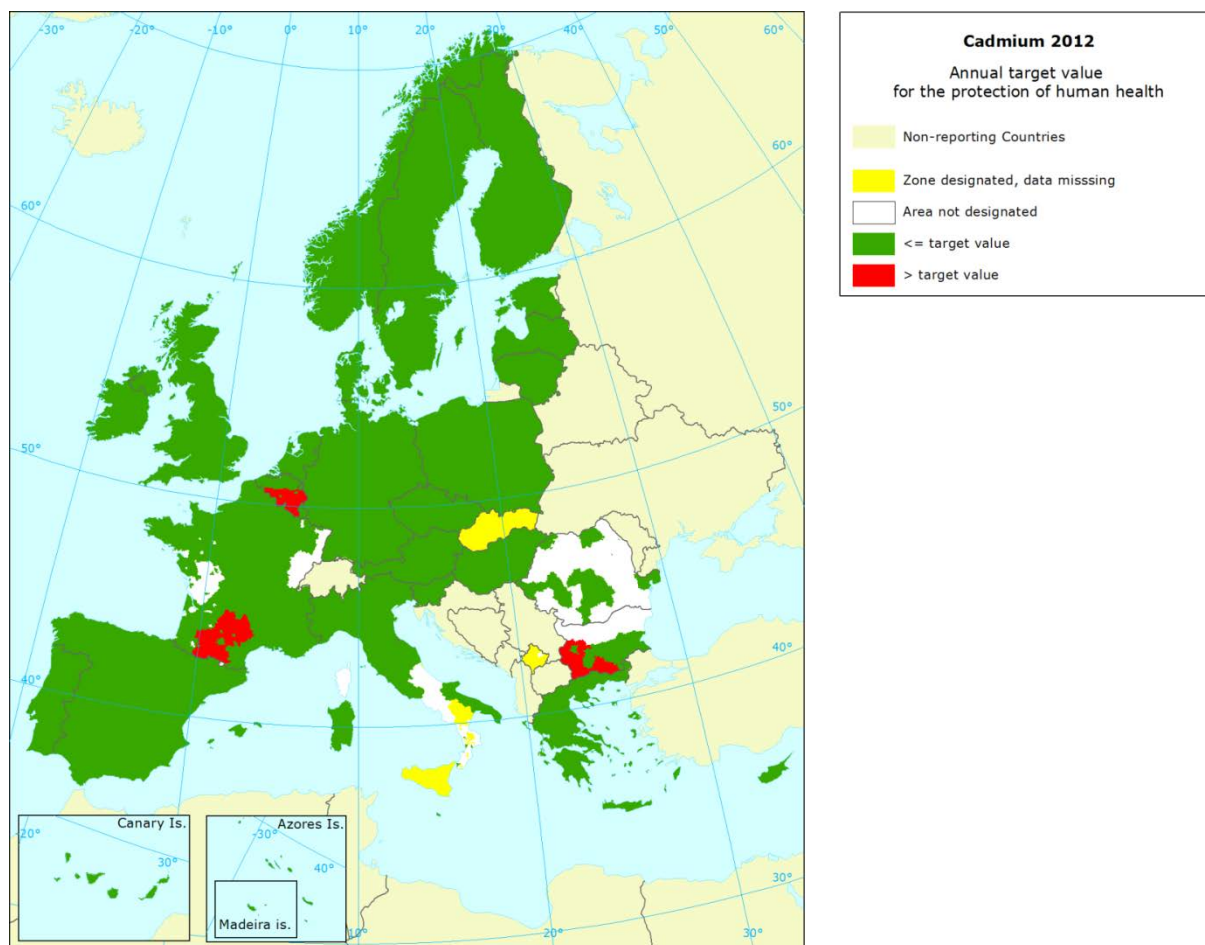


Figure III.14: Zones in exceedance for the target value for cadmium in 2012.

In 6 zones the target value of cadmium has been exceeded in 2012. Belgium (3), Bulgaria (2) and France (1) reported exceedances of the TV. This means one zone less (in France) than in 2011.

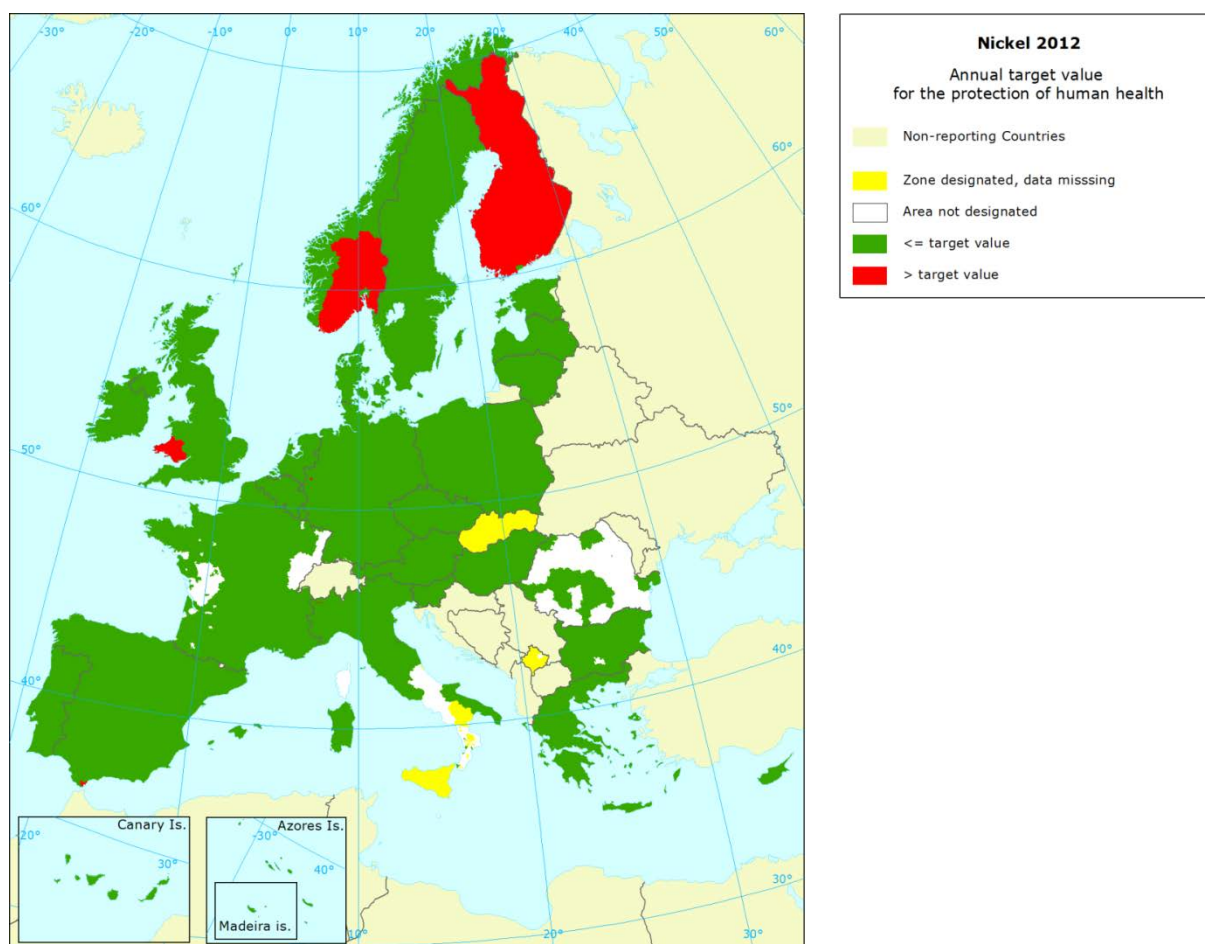


Figure III.15: Zones in exceedance for the target value for nickel in 2012.

In 7 EU27 zones the target value of nickel has been exceeded in 2012. The exceedances are reported for zones in United Kingdom (3), Germany, Spain, Finland and Italy (all 1 zone). Norway also reported one zone in exceedance.

Annex IV. List of zones in relation to AQ standards

This annex presents a summary of air quality status for each pollutant-pollution target combination at the national level.

A full list of zones in EU Member States and other reporting countries in relation to the air quality standards as set in the air quality Directive is available as electronic annex from the ETC/ACM website: http://acm.eionet.europa.eu/docs/AQQlist_of_Zones_2012_ETCACM_TP_2014_1.xlsx

Information extracted from forms 8 and 9.

RC	SO2 health 1h			SO2 health day			SO2 year			SO2 wntr			NO2-h				NO2-y				NOx-y		
	undef	<LV	>LV	undef	<LV	>LV	undef	<LV	>LV	undef	<LV	>LV	undef	<LV	LV - MOT	>MOT	undef	<LV	LV - MOT	>MOT	undef	<LV	>LV
AT	0	11	0	0	11	0	0	8	0	0	8	0	0	11	0	0	0	3	8	0	0	7	1
BE	0	12	0	0	12	0	0	0	0	0	0	0	0	11	0	0	0	8	3	0	0	0	0
BG	0	5	1	0	5	1	0	1	0	0	1	0	0	3	3	0	0	4	2	0	0	1	0
CY	0	1	0	0	1	0	0	1	0	0	1	0	0	1	0	0	0	1	0	0	0	1	0
CZ	0	10	0	0	10	0	0	8	0	0	8	0	0	10	0	0	0	8	2	0	0	8	0
DE	0	75	0	0	75	0	0	15	0	0	15	0	0	79	4	0	0	28	55	0	0	15	0
DK	0	3	0	0	3	0	0	1	0	0	1	0	0	3	0	0	0	2	1	0	0	1	0
EE	0	4	0	0	4	0	0	4	0	0	4	0	0	4	0	0	0	4	0	0	0	4	0
ES	0	132	0	0	132	0	0	38	0	0	38	0	0	132	2	0	0	127	7	0	0	38	0
FI	0	14	0	0	14	0	0	1	0	0	1	0	0	14	0	0	0	13	1	0	0	1	0
FR	0	74	0	0	74	0	0	6	0	0	6	0	0	71	3	0	0	55	19	0	0	15	0
GB	0	44	0	0	44	0	0	15	0	0	15	0	0	42	2	0	0	5	39	0	0	15	0
GR	0	4	0	0	4	0	0	2	0	0	2	0	0	4	0	0	0	3	1	0	0	2	0
HU	0	10	0	0	10	0	0	0	0	0	0	0	0	10	0	0	0	9	1	0	0	0	0
IE	0	4	0	0	4	0	0	1	0	0	1	0	0	4	0	0	0	4	0	0	0	1	0
IT	3	94	0	3	94	0	2	9	0	2	9	0	5	88	5	0	5	59	34	0	2	9	2
LT	0	3	0	0	3	0	0	1	0	0	1	0	0	3	0	0	0	3	0	0	0	0	0
LU	0	3	0	0	3	0	0	1	0	0	1	0	0	3	0	0	0	2	1	0	0	1	0
LV	0	2	0	0	2	0	0	1	0	0	1	0	0	2	0	0	0	1	1	0	0	0	0
MT	0	2	0	0	2	0	0	1	0	0	1	0	0	2	0	0	0	2	0	0	0	1	0
NL	0	9	0	0	9	0	0	1	0	0	1	0	0	9	0	0	0	1	8	0	0	1	0
PL	0	46	0	0	43	3	0	16	0	0	16	0	0	46	0	0	0	40	6	0	0	16	0
PT	0	8	0	0	8	0	0	7	0	0	7	0	2	18	0	0	2	16	2	0	0	6	0
RO	0	50	0	0	50	0	0	4	0	0	4	0	0	40	1	0	0	40	1	0	0	2	0
SE	0	6	0	0	6	0	0	6	0	0	6	0	0	5	1	0	0	4	2	0	0	6	0
SI	0	6	0	0	6	0	0	4	0	0	4	0	0	6	0	0	0	6	0	0	0	4	0
SK	0	10	0	0	10	0	0	1	0	0	1	0	0	10	0	0	0	9	1	0	0	1	0
EU27	3	642	1	3	639	4	2	153	0	2	153	0	7	631	21	0	7	457	195	0	2	156	3
NO	0	7	0	0	6	1	0	7	0	0	7	0	0	6	1	0	0	5	2	0	0	7	0
XK	1	1	0	1	1	0	0	1	0	0	1	0	1	1	0	0	1	1	0	0	0	1	0
total	4	650	1	4	646	5	2	161	0	2	161	0	8	638	22	0	8	463	197	0	2	164	3

RC	PM10-d			PM10-y			Lead			Benzene				CO		
	undef	<LV	>LV	undef	<LV	>LV	undef	<LV	>LV	undef	<LV	LV - MOT	>MOT	undef	<LV	>LV
AT	0	9	2	0	11	0	0	11	0	0	11	0	0	0	11	0
BE	0	3	8	0	11	0	0	11	0	1	6	0	0	0	7	0
BG	0	0	6	0	0	6	0	4	0	0	6	0	0	0	6	0
CY	0	0	1	0	0	1	0	1	0	0	1	0	0	0	1	0
CZ	0	1	9	0	9	1	0	10	0	0	9	1	0	0	10	0
DE	0	73	7	0	80	0	0	70	0	0	79	1	0	0	80	0
DK	0	3	0	0	3	0	0	3	0	0	3	0	0	0	3	0
EE	0	4	0	0	4	0	0	4	0	0	2	0	0	0	4	0
ES	0	115	20	0	134	1	0	81	0	0	122	0	0	0	128	0
FI	0	14	0	0	14	0	0	14	0	0	3	0	0	0	14	0
FR	0	55	19	0	71	3	0	61	0	0	61	0	0	0	76	0
GB	0	43	1	0	44	0	0	44	0	0	44	0	0	0	44	0
GR	0	2	2	0	3	1	0	4	0	0	4	0	0	0	4	0
HU	0	5	5	0	10	0	0	10	0	0	10	0	0	0	10	0
IE	0	4	0	0	4	0	0	4	0	0	4	0	0	0	4	0
IT	5	49	44	5	76	17	8	77	0	5	90	1	0	5	92	0
LT	0	3	0	0	3	0	0	3	0	0	3	0	0	0	3	0
LU	0	3	0	0	3	0	0	3	0	0	1	0	0	0	1	0
LV	0	1	1	0	2	0	0	2	0	0	2	0	0	0	2	0
MT	0	1	1	0	1	1	0	2	0	0	2	0	0	0	2	0
NL	0	7	2	0	9	0	0	9	0	0	9	0	0	0	9	0
PL	0	8	38	0	28	18	0	46	0	0	45	1	0	0	46	0
PT	2	18	4	2	22	0	0	1	0	0	1	0	0	0	1	0
RO	0	39	5	0	41	3	0	26	0	0	38	0	0	0	49	0
SE	0	4	2	0	6	0	0	6	0	0	6	0	0	0	6	0
SI	0	2	4	0	6	0	0	7	0	0	6	0	0	0	6	0
SK	0	2	8	0	9	1	2	0	0	0	10	0	0	0	10	0
EU27	7	468	189	7	604	53	10	514	0	6	578	4	0	5	629	0
NO	0	5	2	0	7	0	0	7	0	0	7	0	0	0	7	0
XK	1	0	1	1	0	1	1	0	0	1	0	0	0	1	1	0
total	8	473	192	8	611	54	11	521	0	7	585	4	0	6	637	0

RC	O3-H				O3-V				PM2.5 limit value				PM2.5-target value		
	undef	<LTO	LTO - TV	>TV	undef	<LTO	LTO - TV	>TV	undef	<LV	LV - MOT	>MOT	undef	<TV	>TV
AT	0	0	1	10	0	0	0	11	2	9	0	0	2	9	0
BE	0	0	6	0	0	0	6	0	0	11	0	0	0	11	0
BG	0	0	3	3	0	0	2	4	0	2	0	4	0	2	4
CY	0	0	0	1	0	0	0	1	0	1	0	0	0	1	0
CZ	0	0	2	8	0	0	0	10	0	8	0	2	0	8	2
DE	0	0	53	13	0	0	60	6	0	73	0	0	0	73	0
DK	0	0	3	0	0	2	1	0	0	3	0	0	0	3	0
EE	0	4	0	0	0	4	0	0	0	4	0	0	0	4	0
ES	0	4	80	51	0	31	48	56	0	135	0	0	0	135	0
FI	0	0	2	0	0	0	2	0	0	14	0	0	0	14	0
FR	0	5	47	21	0	6	44	14	0	59	0	1	0	59	1
GB	0	2	42	0	0	40	4	0	0	44	0	0	0	44	0
GR	0	1	0	3	0	0	2	2	1	1	0	0	1	1	0
HU	0	0	4	6	0	0	0	0	0	5	0	1	0	5	1
IE	0	1	3	0	0	1	0	0	0	4	0	0	0	4	0
IT	4	6	10	66	25	1	3	45	6	63	8	14	8	61	21
LT	0	0	3	0	0	0	1	0	0	3	0	0	0	3	0
LU	0	0	2	1	0	0	0	1	0	3	0	0	0	3	0
LV	0	1	1	0	0	0	1	0	0	2	0	0	0	2	0
MT	0	0	1	1	0	0	0	1	0	2	0	0	0	2	0
NL	0	0	9	0	0	1	8	0	0	9	0	0	0	9	0
PL	0	1	39	6	30	0	10	6	0	21	3	22	0	21	25
PT	1	1	13	4	12	2	4	1	0	1	0	0	0	1	0
RO	0	19	22	4	0	3	2	1	0	14	1	2	0	14	3
SE	0	0	6	0	0	4	2	0	0	6	0	0	0	6	0
SI	0	1	0	5	0	0	0	5	0	6	0	0	0	6	0
SK	0	0	0	2	0	0	0	2	0	5	2	3	0	5	5
EU27	5	46	352	205	67	95	200	166	9	508	14	49	11	506	62
NO	0	5	2	0	0	7	0	0	0	7	0	0	0	7	0
XK	1	0	0	1	2	0	0	0	1	0	0	1	1	0	1
total	6	51	354	206	69	102	200	166	10	515	14	50	12	515	61

RC	As			Cd			Ni			B(a)P		
	undef	<TV	>TV	undef	<TV	>TV	undef	<TV	>TV	undef	<TV	>TV
AT	0	11	0	0	11	0	0	11	0	0	8	3
BE	0	9	1	0	7	3	0	10	0	0	7	0
BG	0	4	0	0	2	2	0	5	0	0	1	5
CY	0	1	0	0	1	0	0	1	0	0	1	0
CZ	0	10	0	0	10	0	0	10	0	0	0	10
DE	0	67	0	0	67	0	0	66	1	0	71	0
DK	0	3	0	0	3	0	0	3	0	0	3	0
EE	0	4	0	0	4	0	0	4	0	0	3	1
ES	0	82	0	0	82	0	0	81	1	0	82	0
FI	0	2	0	0	2	0	0	1	1	0	1	1
FR	0	57	0	0	56	1	0	57	0	0	58	2
GB	0	44	0	0	44	0	0	41	3	0	36	8
GR	0	4	0	0	4	0	0	4	0	0	1	3
HU	0	10	0	0	10	0	0	10	0	0	2	8
IE	0	4	0	0	4	0	0	4	0	0	4	0
IT	10	77	0	10	77	0	10	76	1	7	66	12
LT	0	3	0	0	3	0	0	3	0	0	0	3
LU	0	3	0	0	3	0	0	3	0	0	3	0
LV	0	2	0	0	2	0	0	2	0	0	2	0
MT	0	2	0	0	2	0	0	0	0	0	2	0
NL	0	9	0	0	9	0	0	9	0	0	9	0
PL	0	44	2	0	46	0	0	46	0	0	4	42
PT	0	1	0	0	1	0	0	1	0	0	1	0
RO	0	13	0	0	22	0	0	22	0	0	0	0
SE	0	6	0	0	6	0	0	6	0	0	6	0
SI	0	7	0	0	7	0	0	7	0	0	2	4
SK	2	0	0	2	0	0	2	0	0	2	0	0
EU27	12	479	3	12	485	6	12	483	7	9	373	102
NO	0	7	0	0	7	0	0	6	1	0	7	0
XK	1	0	0	1	0	0	1	0	0	1	0	0
total	13	486	3	13	492	6	13	489	8	10	380	102

Annex V. Historical list of designated zones

Table Va. Number of zones per reporting country in the previous reporting year, 2011, including the designation of the zones for individual pollutants or types of protection targets (Jimmink et al. 2013). Yellow cells indicate pollutant/protection target combinations for which the number of zones has been changed in 2012. Iceland did not report for the year 2012.

Reporting Country	Total (a)	SO ₂		NO ₂	NO _x	PM ₁₀	Lead	benzene	CO	Ozone	As	Cd	Ni	BaP	PM _{2.5}
		health	veg												
AT	19	11	8	11	8	11	11	11	11	11	11	11	11	11	11
BE	22	12	0	11	0	11	11	7	7	6	10	10	10	7	11
BG	6	6	1	6	1	6	4	6	6	6	4	4	5	6	6
CY	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
CZ	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15
DE	110	75	15	83	15	81	70	80	80	66	67	67	67	71	74
DK	3	3	1	3	1	3	3	3	3	3	3	3	3	3	3
EE	4	4	4	4	4	4	4	2	4	4	4	4	4	4	4
ES	157	132	38	134	38	135	81	122	131	135	76	76	76	76	135
FI	18	14	1	14	1	14	14	3	14	2	2	2	2	2	14
FR	76	76	6	75	13	74	65	61	76	73	55	55	54	57	59
GB	44	44	43	44	43	44	44	44	44	44	44	44	44	44	44
GR	4	4	2	4	2	4	4	4	4	4	4	4	4	4	2
HU	10	10	0	10	0	10	10	10	10	10	10	10	10	10	5
IE	4	4	1	4	1	4	4	4	4	4	4	4	4	4	4
IT	151	96	22	137	31	137	69	98	105	97	43	43	43	42	114
LT	3	3	1	3	0	3	3	3	3	3	3	3	3	3	3
LU	4	3	1	3	1	3	3	1	1	3	3	3	3	3	3
LV	2	2	1	2	0	2	2	2	2	2	2	2	2	2	2
MT	2	2	1	2	1	2	0	2	2	2	0	0	0	0	2
NL	9	9	1	9	1	9	9	9	9	9	9	9	9	9	9
PL	46	46	16	46	16	46	46	46	46	46	46	46	46	46	46
PT	26	20	7	20	7	23	1	1	1	19	1	1	1	1	1
RO (a)	50	40	3	29	3	28	23	24	43	41	11	22	19	0	18
SE	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
SI	8	6	4	6	4	6	7	6	6	6	7	7	7	6	6
SK	11	9	1	10	1	10	2	10	9	2	2	2	2	2	8
EU27	811	653	200	692	214	692	512	581	643	620	443	454	451	435	606
NO	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
IS	4	3	1	3	0	3	2	2	2	2	0	0	0	0	3
all	822	663	208	702	221	702	521	590	652	629	450	461	458	442	616

(a) In the zone information provided by Romania an inconsistency has been noted between the spatial data (GIS information) and the zone definition as given in Form 2 of the Questionnaire. The spatial data contains boundaries of four more zones which are not included in definition in Form 2 (no reference to these four zones has been made in any other form of the Questionnaire). Any further meta-information on these zones is not available. In all the maps presented in this report, these zones are coloured yellow ("missing information").

Table Vb. Total number of zones per Member State in 2004-2012 (data extracted from form 2); highlighted boxes indicate that the number of zones designated in 2012 differs from the corresponding number in previous reporting year.

Member State	Total zones 2004	Total zones 2005	Total zones 2006	Total zones 2007	Total zones 2008	Total zones 2009	Total zones 2010	Total zones 2011	Total zones 2012
AT	19	19	19	19	19	19	19	19	19
BE	17	17	17	18	22	22	22	22	22
BG			6	6	6	6	6	6	6
CY	1	1	1	1	1	1	1	1	1
CZ	15	15	15	15	15	15	15	15	10
DE	145	118	120	120	111	113	115	110	109
DK	10	10	10	3	3	3	3	3	3
EE	16	4	4	4	4	4	4	4	4
ES	140	140	138	138	153	153	157	157	156
FI	18	18	18	18	18	18	18	18	18
FR	85	87	88	81	81	81	76	76	76
GB	43	43	44	44	44	44	44	44	44
GR	4	4	4	4	4	4	4	4	4
HU	11	11	11	11	11	11	10	10	10
IE	4	4	4	4	4	4	4	4	4
IT	137	144	121	143	145	142	142	151	109
LT	3	3	3	3	3	3	3	3	3
LU			3	3	3	4	4	4	4
LV	2	2	2	2	2	2	2	2	2
MT	3	2	2	2	2	2	2	2	2
NL	9	9	9	9	9	9	9	9	9
PL	362	362	362	186	186	186	46	46	46
PT	26	26	26	27	34	29	28	26	25
RO			4	21	21	21	21	50	54
SE	6	6	6	6	6	6	6	6	6
SI	9	9	9	10	12	12	12	8	8
SK	10	10	10	11	11	11	11	11	11
EU25	1095	1064	1046	882	903	898	757	755	705
EU27			1056	909	930	925	784	811	765