

25 May 2020
Storie d'Aria, WebinAIR, remotely
organized by Cittadini per l'Aria

Air quality in Europe – 2019 report. Focus on Italy

EEA air pollution data

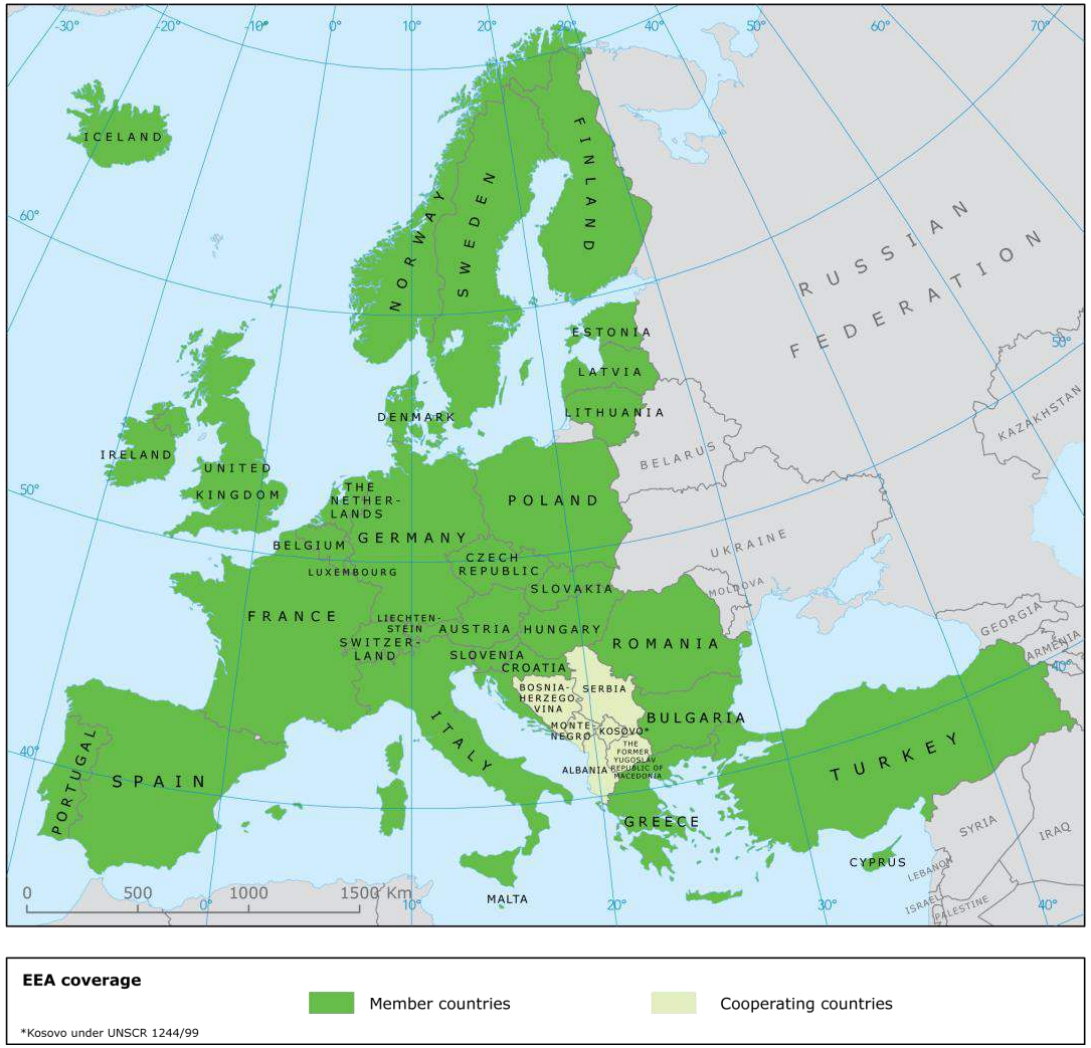
European Environment Agency

The European Environment Agency

The EEA is an EU agency that operates at the **interface of science and policy**.

The EEA provides **timely, reliable, targeted and relevant** information to support sustainable development.

The Eionet (European environment information and observation) network comprises **1800 experts** from over **400 national institutions** in **39 countries**.



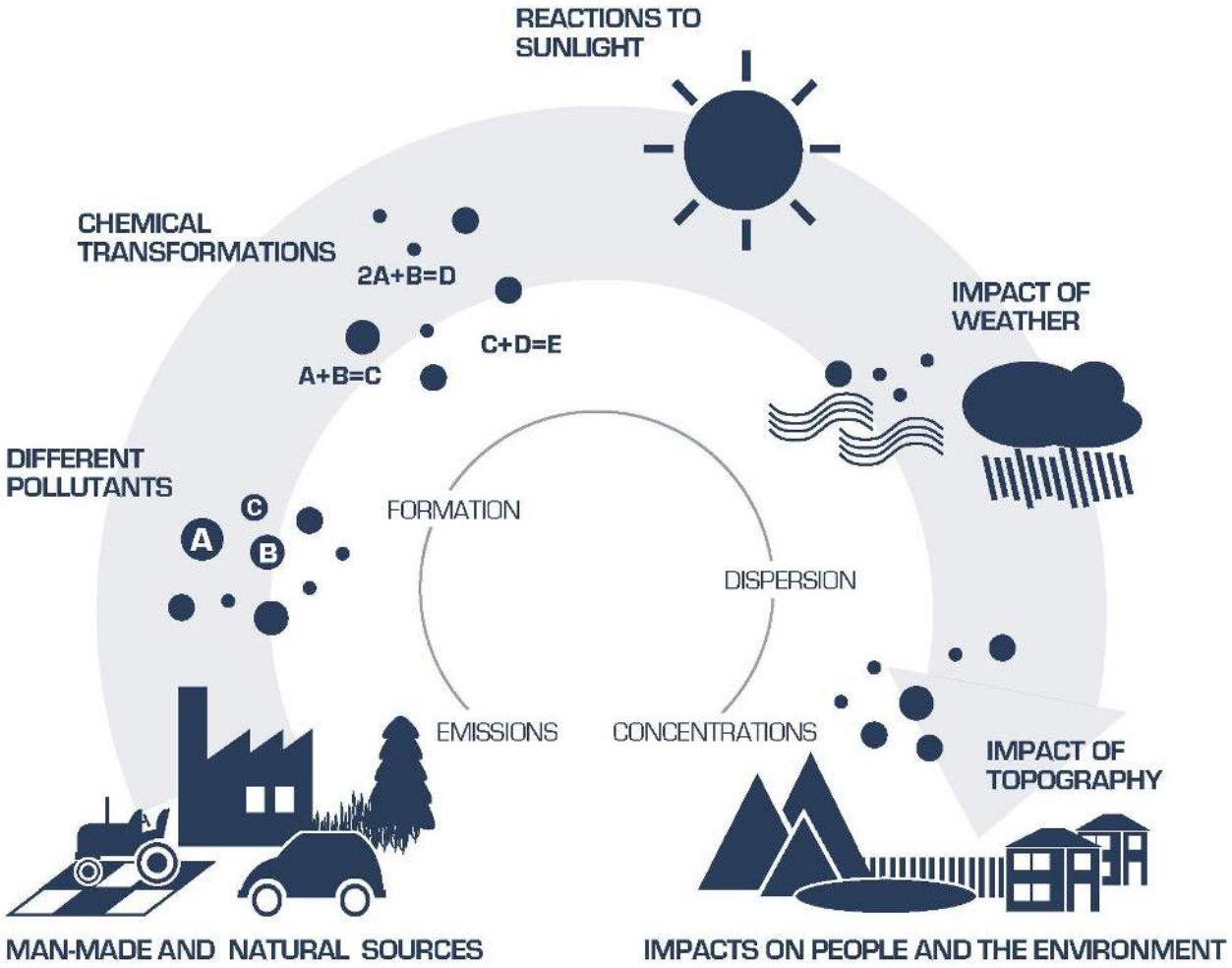
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Outline

1. Air pollution: basics and data
2. The *Air Quality in Europe* report
3. Emissions
4. Concentrations
5. Exposure of population
6. Health effects
7. Exposure of vegetation
8. Conclusions
9. Air pollution data at EEA



1. Air pollution basics: from emissions to concentrations and impacts



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1. European air pollution policies: emissions

National Emission Ceiling Directive:

- SO_2, NO_X, NMVOCs, NH_3, $PM_{2.5}$
- Ceilings for (2010, 2019); 2020 and 2030

Sectoral legislation

- Transport (road, ships, non-road mobile machine, fuels)
- Industry (IED, Industrial Emissions Directive)
- Combustion (Directive on medium combustion plants)
- Products (paints)



European Commission: DG ENV – European legislation

Convention of Long-Range transboundary air pollution

1. Air pollution policies: air quality

Air Quality Directives

- Objectives and standards for several pollutants
- Assessment of air quality:
  - Zones/agglomerations, measurement, models
- Management of air quality:
  - Short term action plans
  - Plans to improve/maintain air quality
- Information to the public



Implementing Decision on reporting

- Information to be reported to the European Commission via the European Environment Agency.

1. Air pollution policies: some air quality standards

EU Air Quality Directive				WHO Guidelines	
Pollutant	Averaging Period	Objective and legal nature and concentration	Comments	Concentration	Comments
$PM_{2.5}$	Hourly			25 µg/m³	99th percentile (3 days/year)
$PM_{2.5}$	Annual	Limit value, 25 µg/m³		10 µg/m³	
PM_{10}	Hourly	Limit value, 50 µg/m³	Not to be exceeded on more than 35 days per year	50 µg/m³	99th percentile (3 days/year)
PM_{10}	Annual	Limit value, 40 µg/m³		20 µg/m³	
O_3	Maximum daily 8-hour mean	Target value, 120 µg/m³	Not to be exceeded on more than 25 days per year, averaged over three years	100 µg/m³	
NO_2	Hourly	Limit value, 200 µg/m³	Not to be exceeded on more than 18 times a calendar year	200 µg/m³	
NO_2	Annual	Limit value, 40 µg/m³		40 µg/m³	

2. The *Air quality in Europe* report

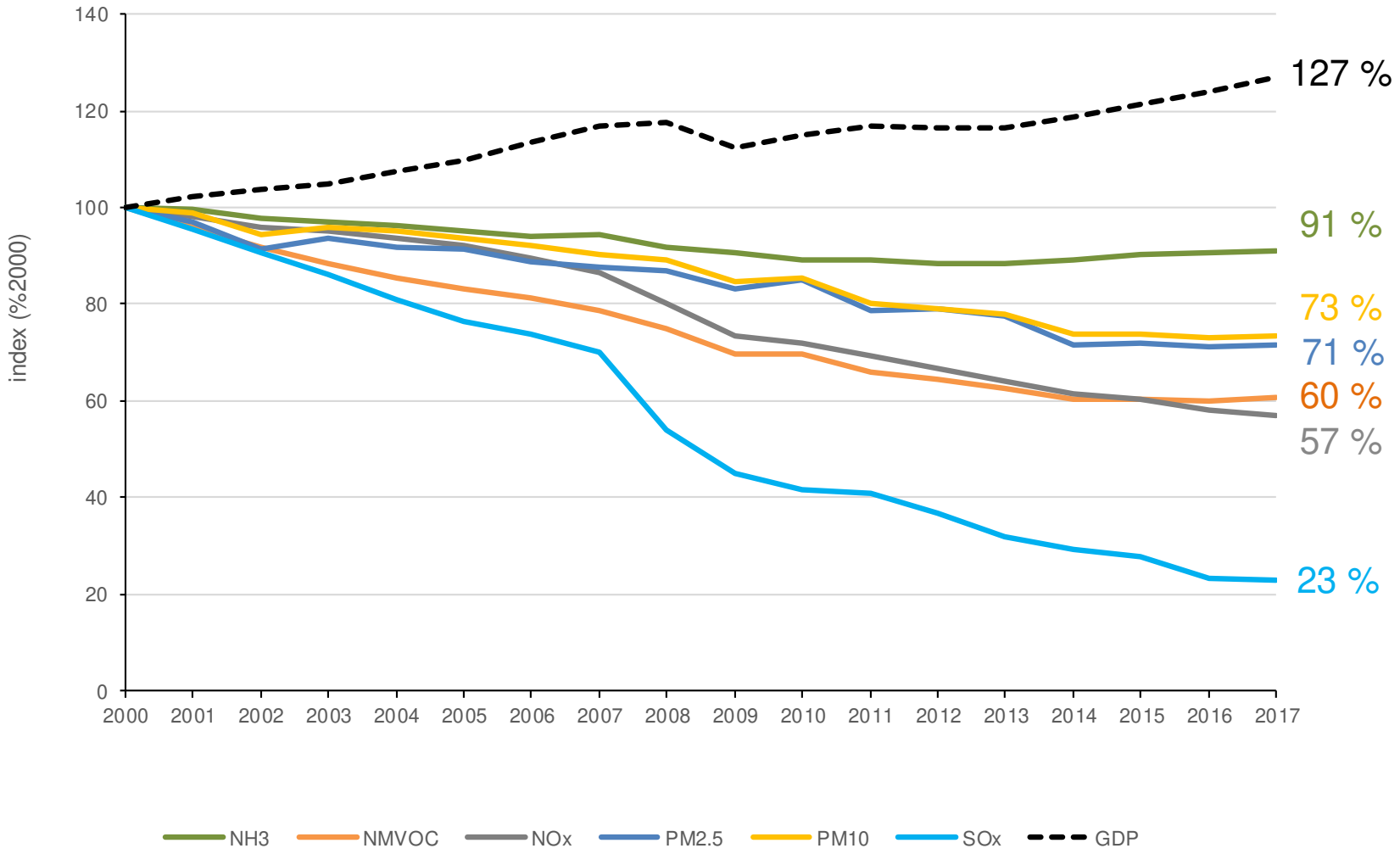


https://www.eea.europa.eu/publications/air-quality-in-europe-2019



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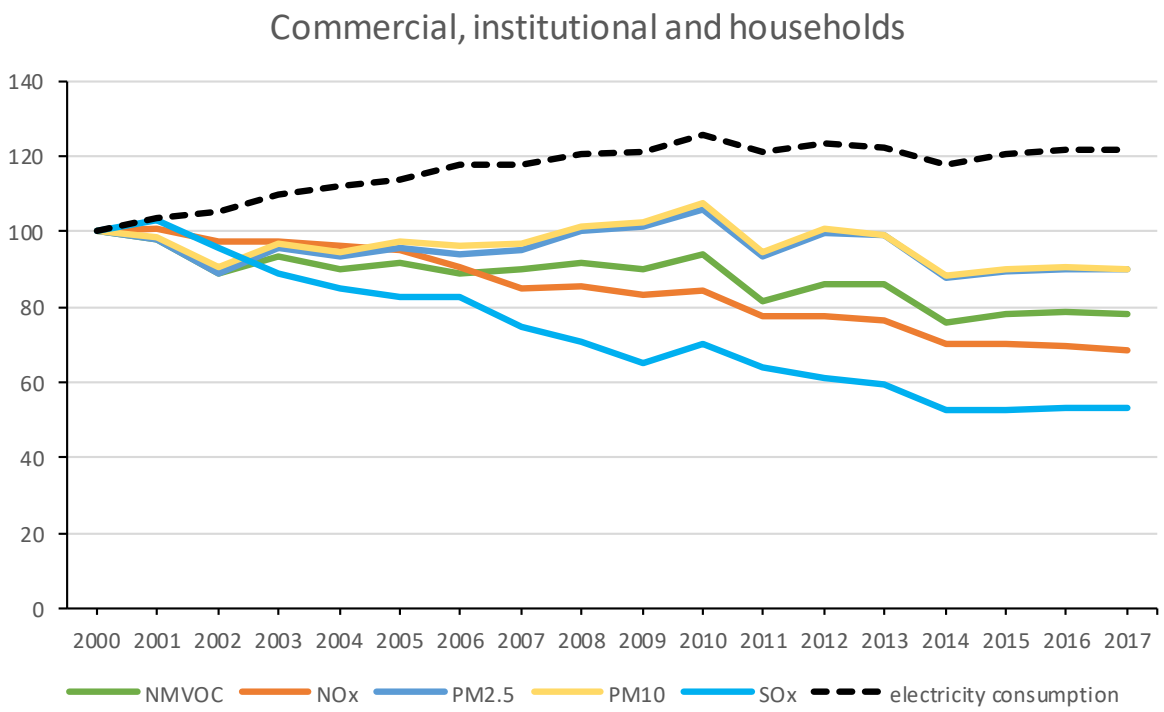
3. Air quality in Europe: emissions have decreased

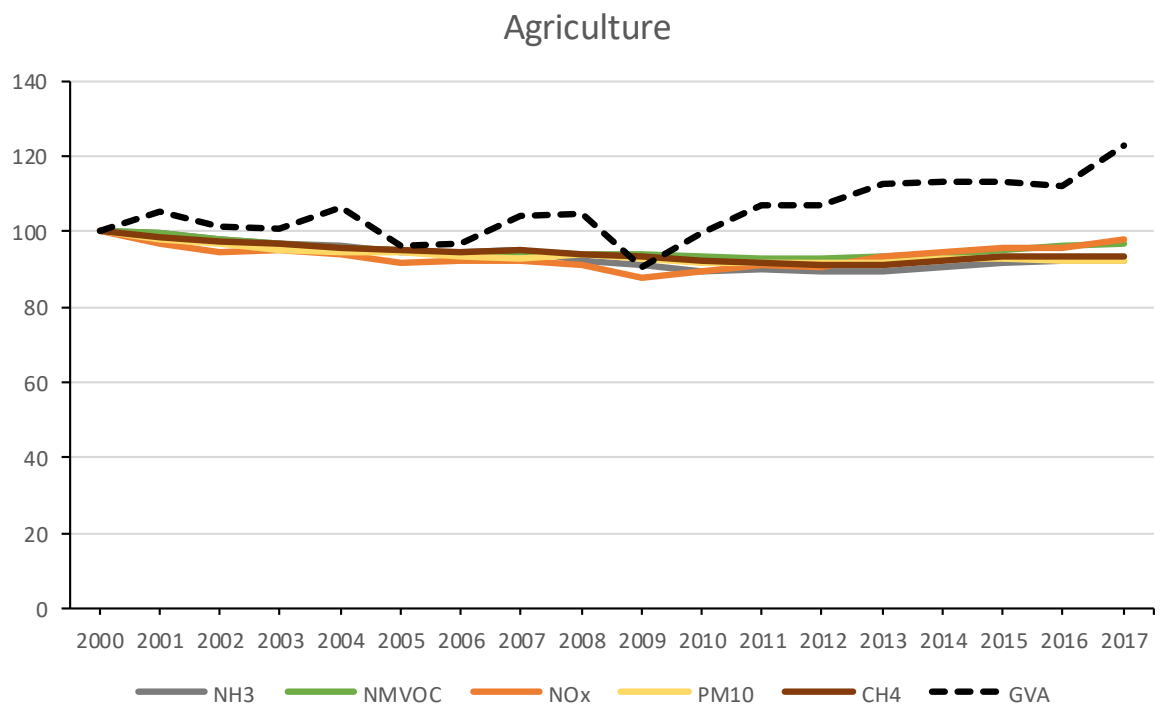


EU Member States (2000 – 2017)

European Environment Agency

3. Emissions have decreased but not equally from all sectors

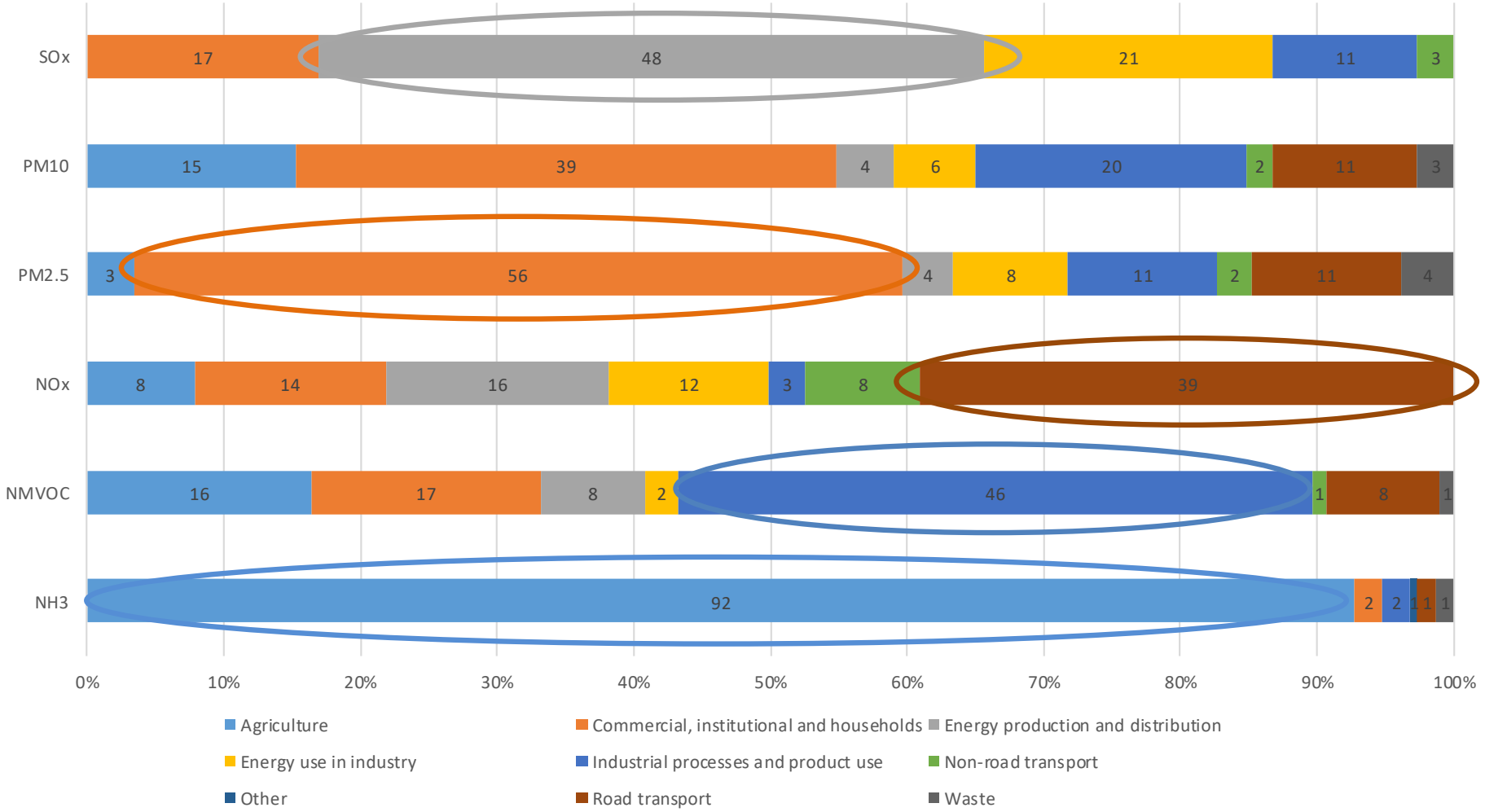




EU Member States (2017)

European Environment Agency

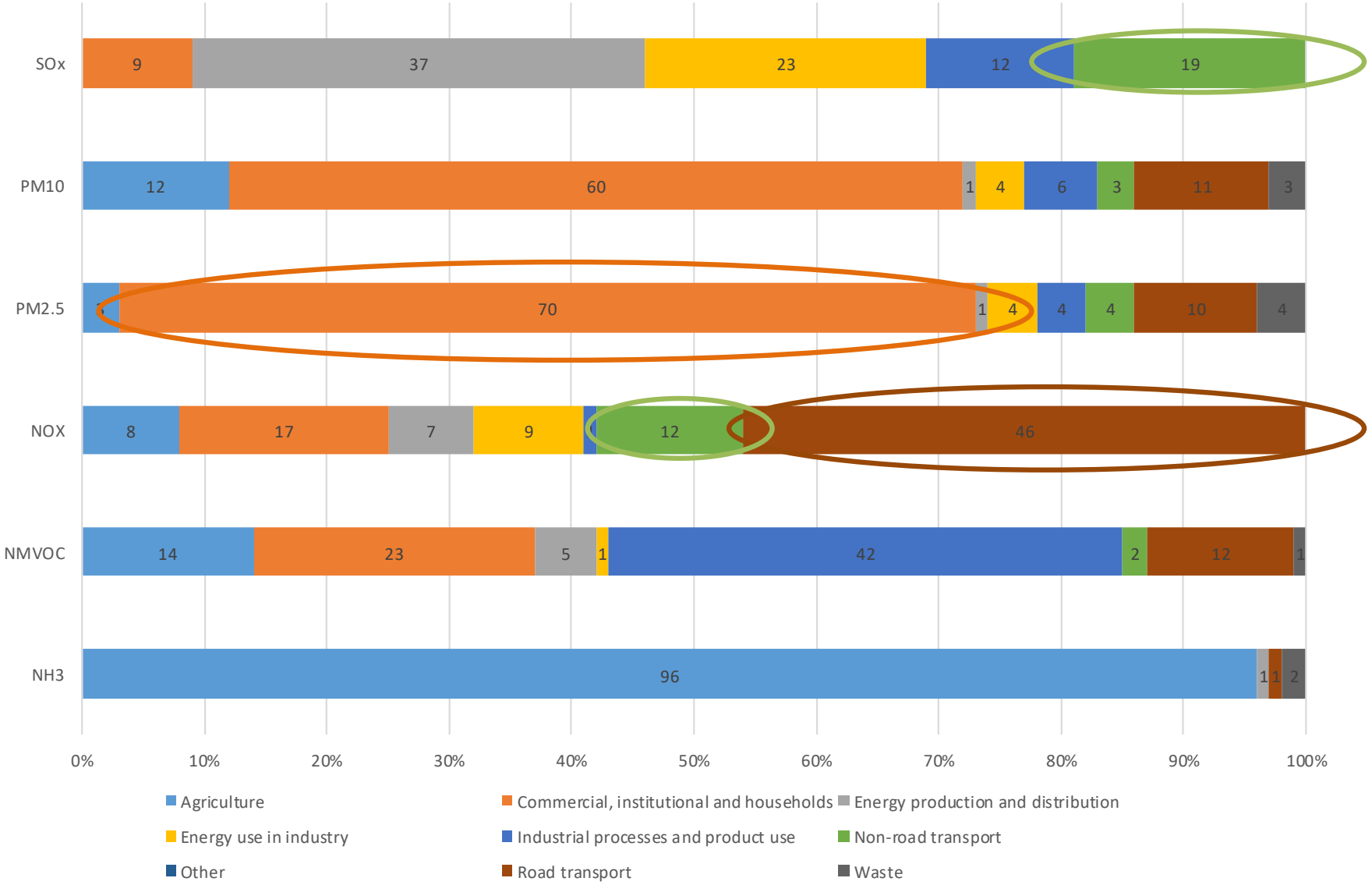
3. European emissions from different sectors



EU Member States (2017)

European Environment Agency

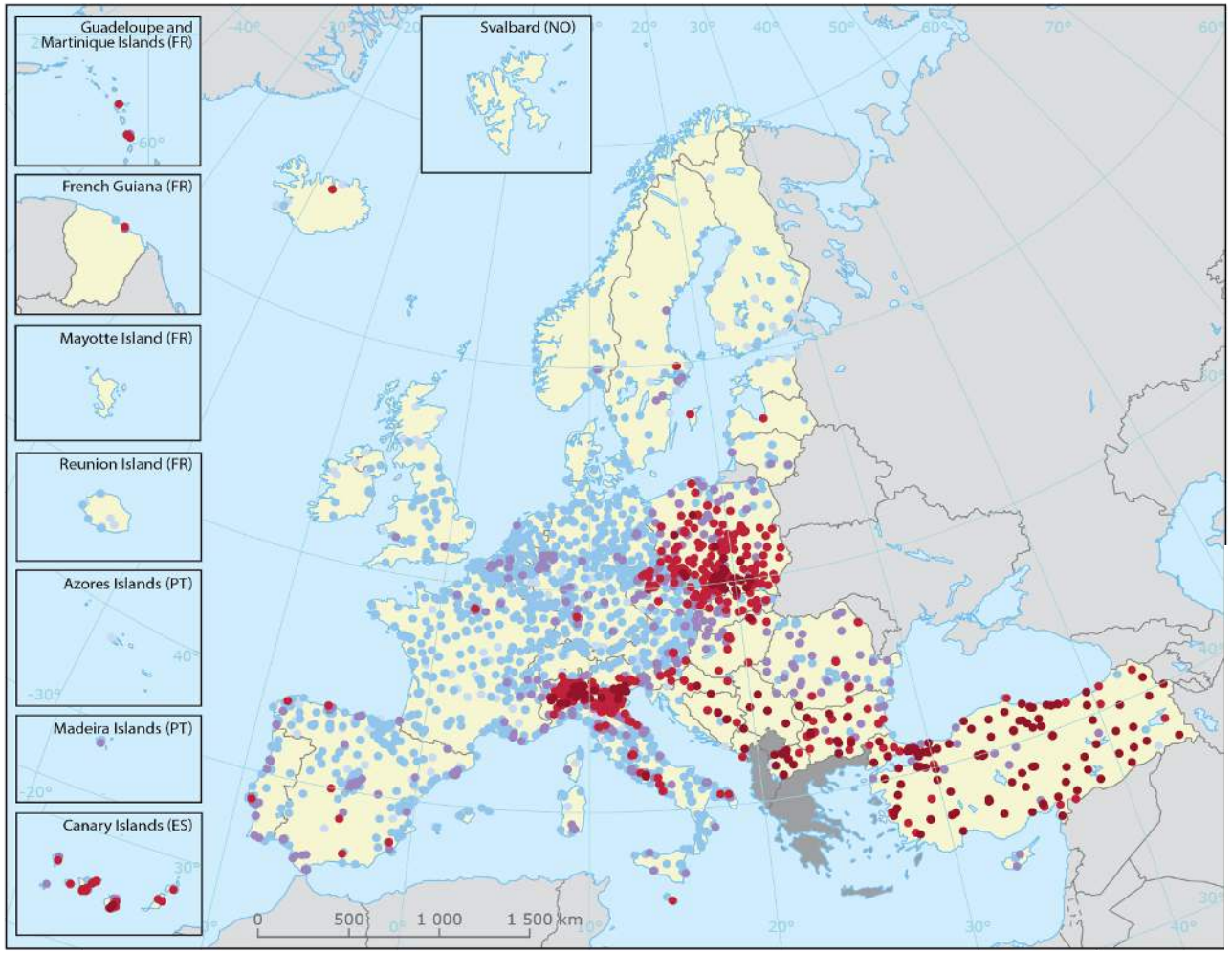
3. Italian emissions from different sectors



Italy (2017)

European Environment Agency

4. Particulate matter (PM_{10}) concentrations over Europe



90.4 percentile of PM_{10} daily concentrations in 2017

µg/m³

- ≤ 20
- 20-40
- 40-50
- 50-75
- > 75

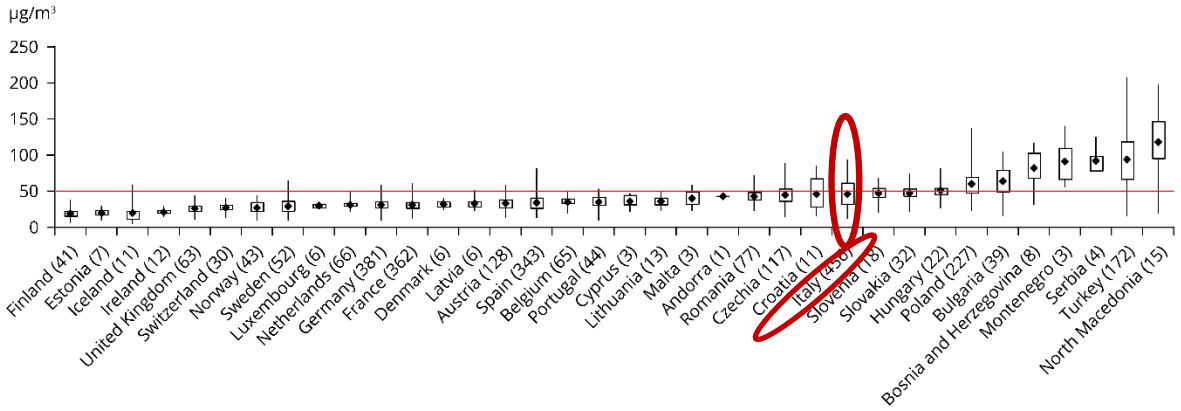
No data

Countries/regions not included in the data exchange process

17 MS + 6 other reporting countries exceeded DLV

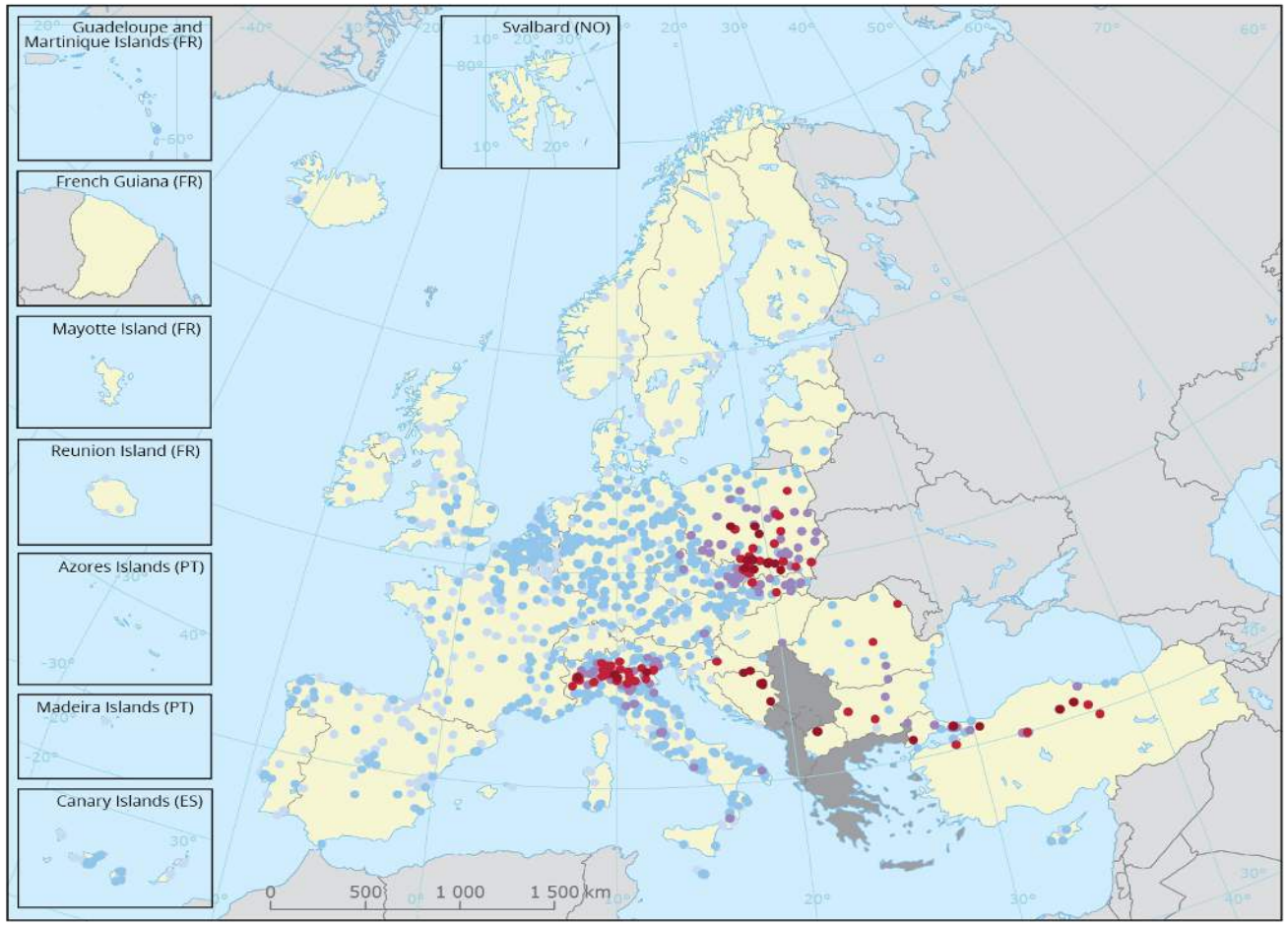
22 % of reporting stations

Urban issue



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4. $PM_{2.5}$ concentrations over Europe



Annual mean $PM_{2.5}$ concentrations in 2017

µg/m³

- ≤ 10
- 10-20
- 20-25
- 25-30
- > 30

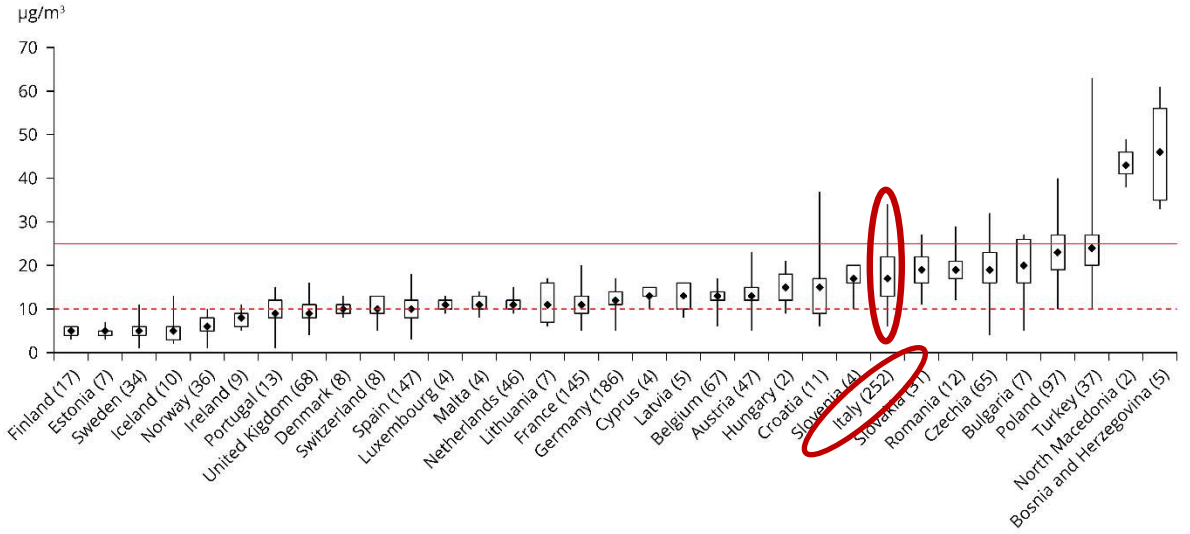
No data

Countries/regions not included in the data exchange process

7 MS + 3 other reporting countries exceeded ALV

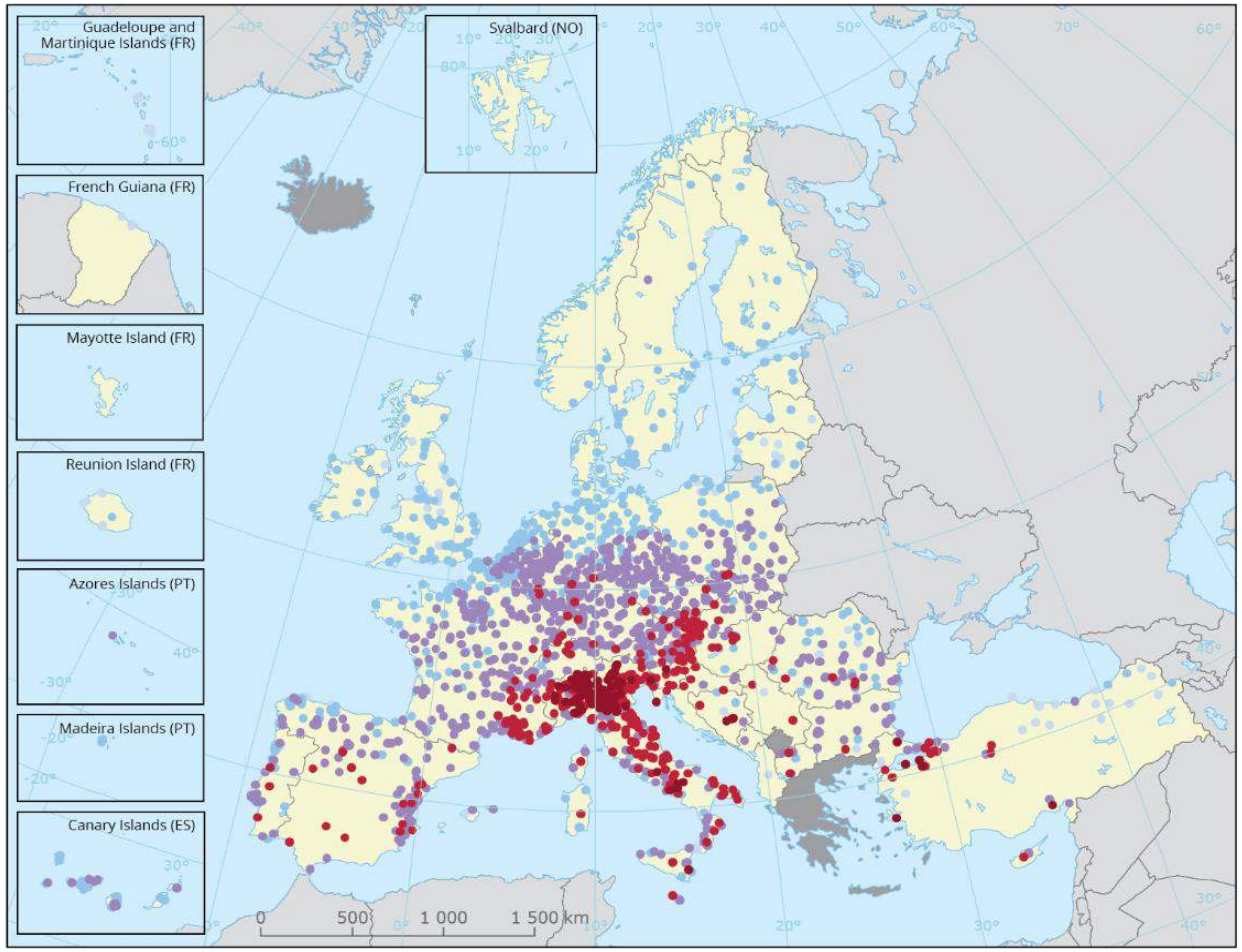
7 % of reporting stations

Only Estonia, Finland and Norway complied with the WHO AQG



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3. O_3 concentrations over Europe



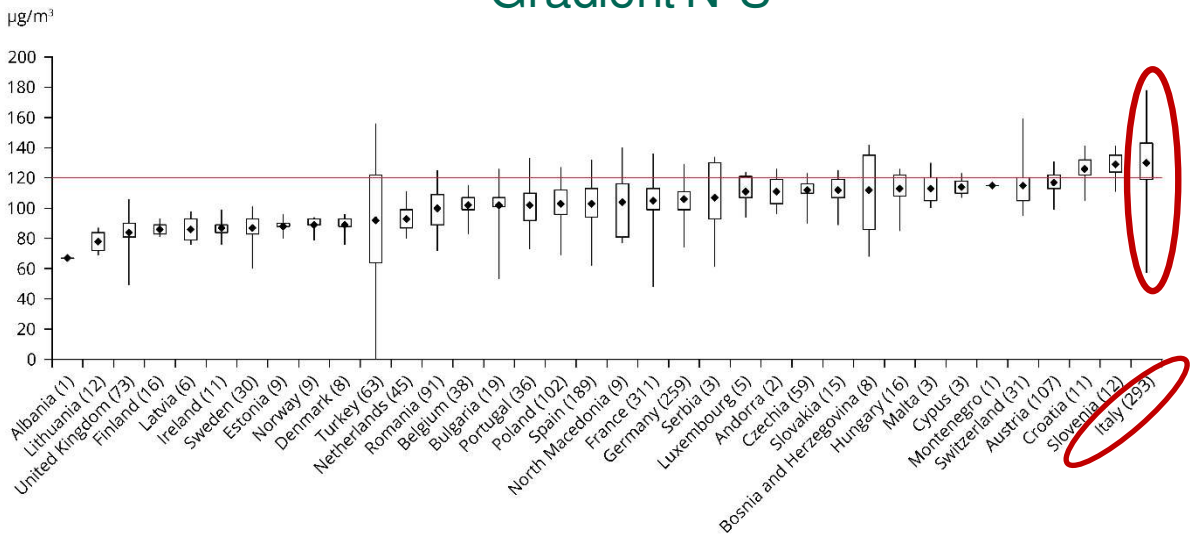
93.2 percentile of O_3 maximum daily 8-hour mean in 2017

µg/m³

- ≤ 80
- 80-100
- 100-120
- 120-140
- > 140

No data

Countries/regions not included in the data exchange process



17 MS + 6 other reporting countries exceeded TV

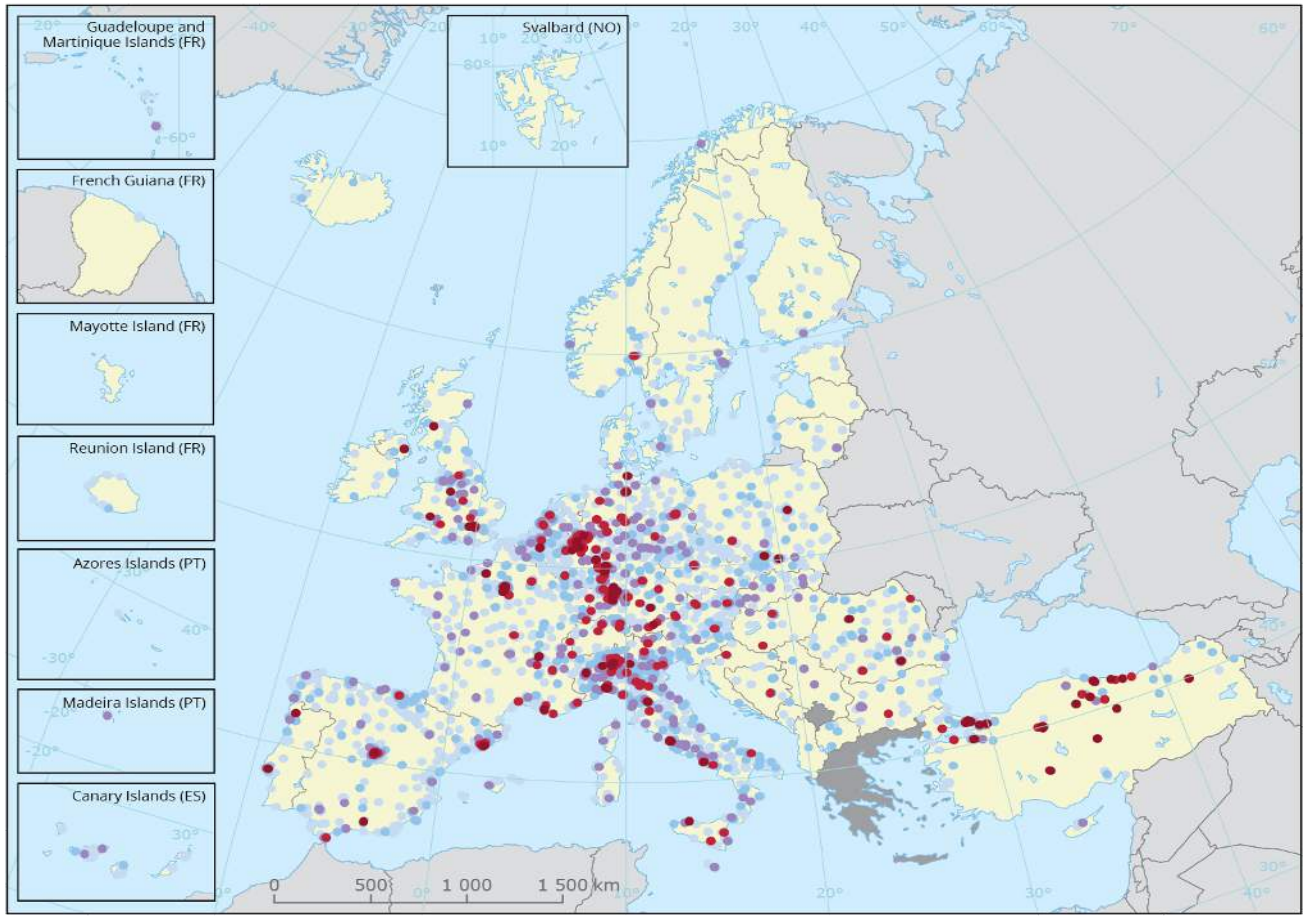
20 % of reporting stations

Only 18 % of stations fulfilled the long-term objective

Gradient N-S

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4. NO_2 concentrations over Europe



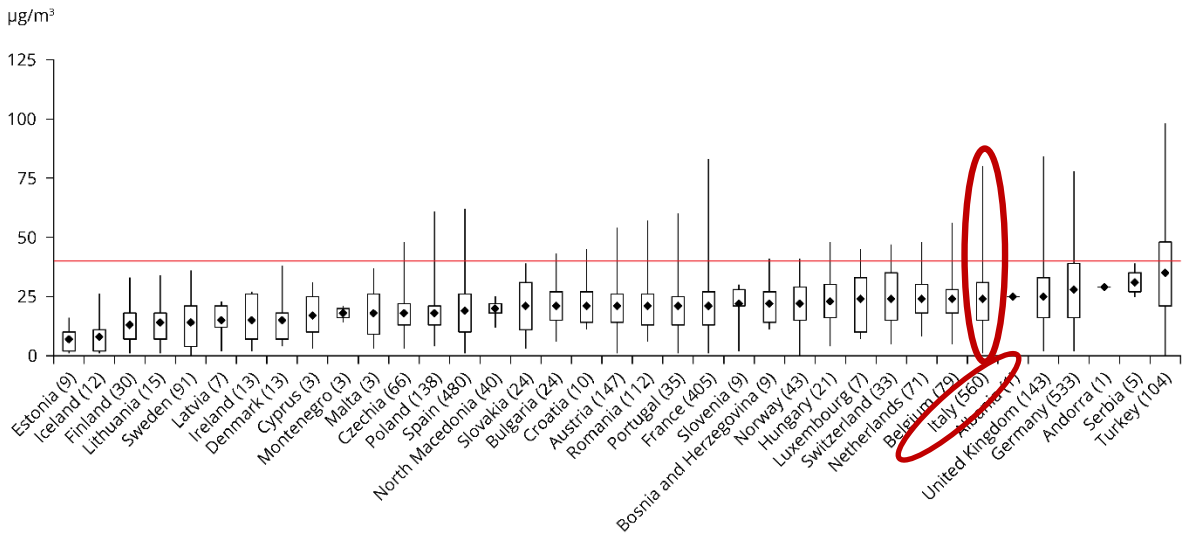
Annual mean NO_2 concentrations in 2017

µg/m³

- ≤ 20
- 20-30
- 30-40
- 40-50
- > 50

No data

Countries/regions not included in the data exchange process



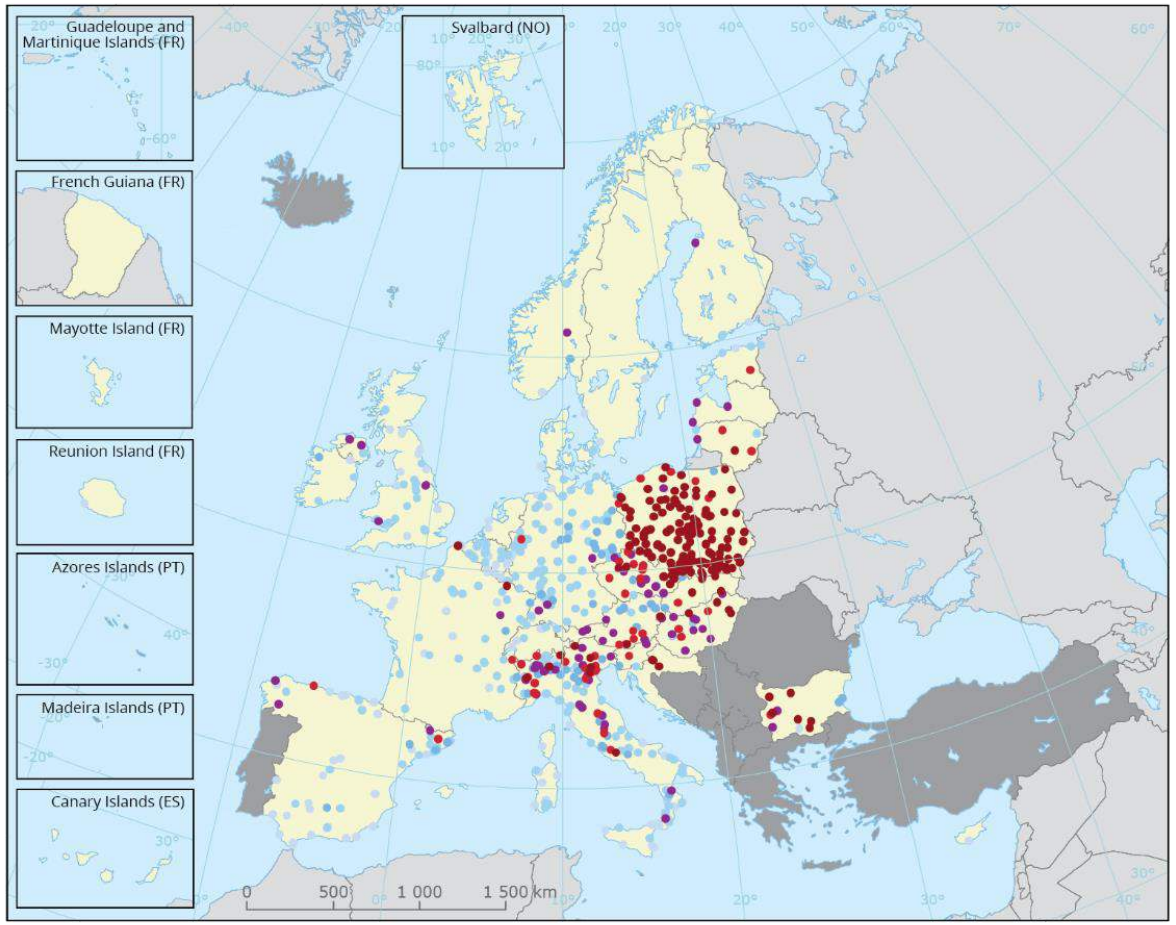
16 MS + 4 other reporting countries exceeded ALV

10 % of reporting stations

Traffic issue

European Environment Agency

4. Benzo[*a*]pyrene concentrations are still high in Eastern Europe



Annual mean BaP concentrations in 2017

ng/m³

- ≤ 0.12
- 0.12-0.40
- 0.40-0.60
- 0.60-1.00
- 1.00-1.50
- > 1.50

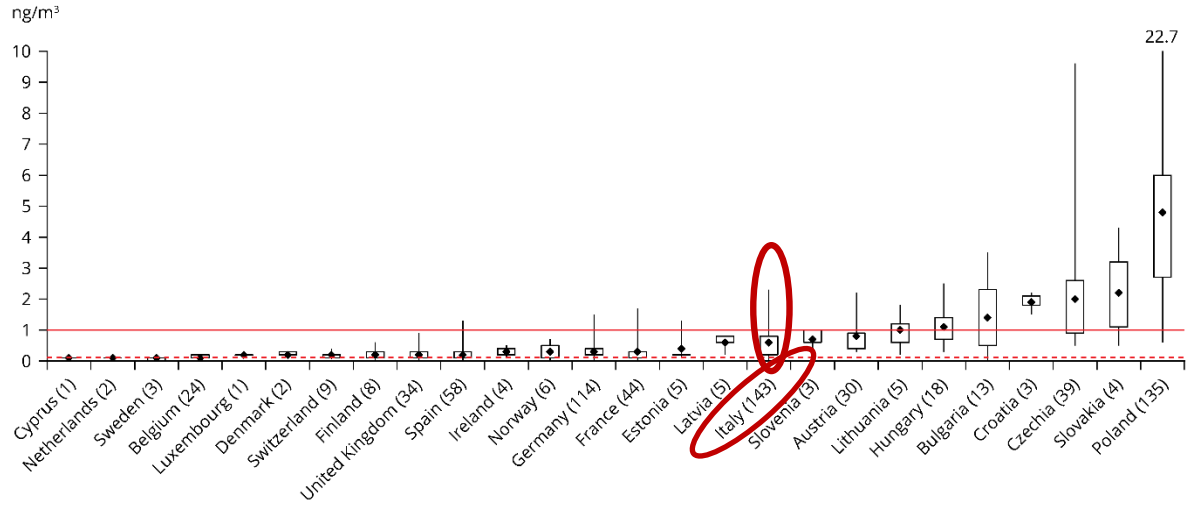
No data

Countries/regions not included in the data exchange process

13 MS reported concentrations above 1 ng/m³

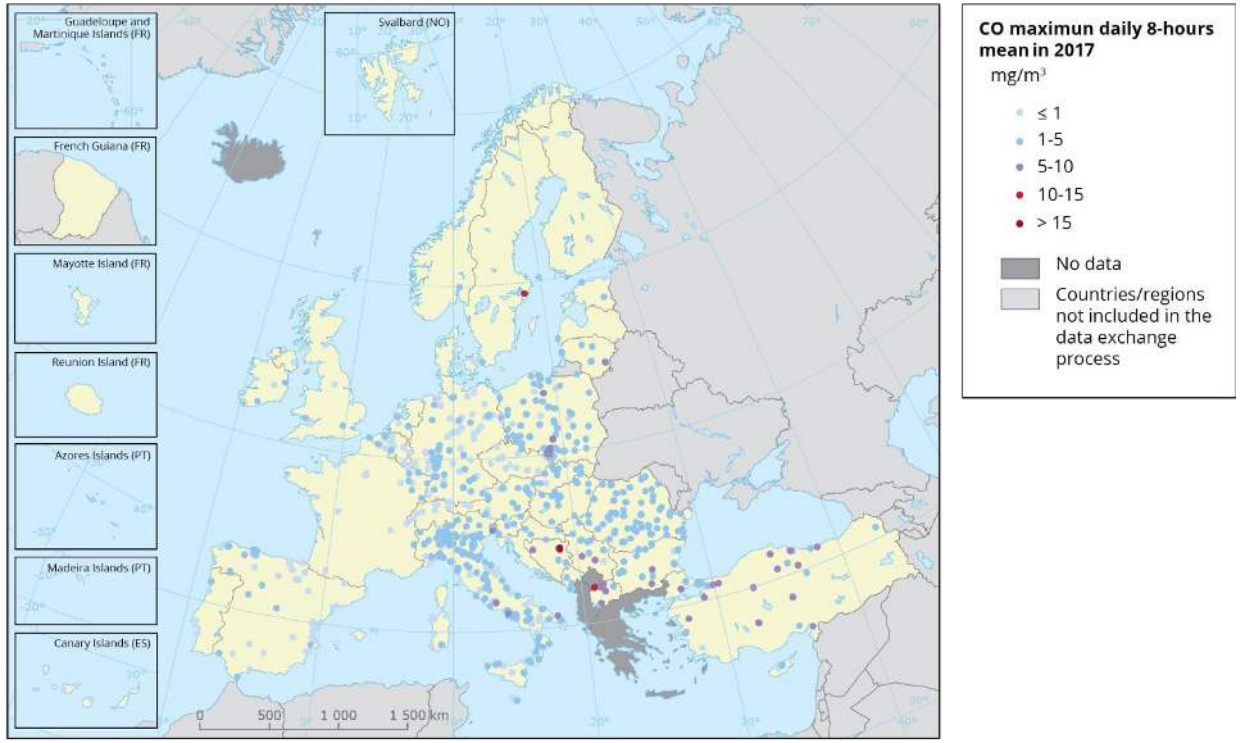
31 % of reporting stations

Linked to domestic combustion of coal and wood

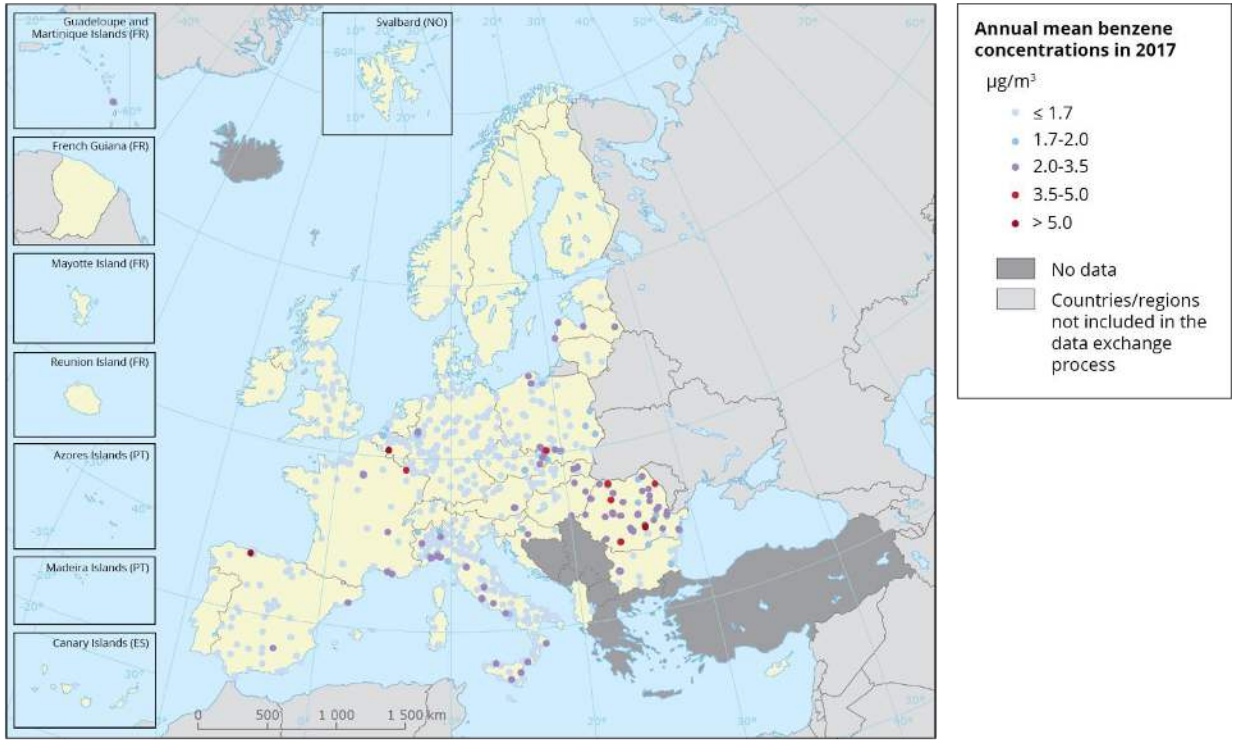


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4. CO and benzene concentrations are very rarely above LV



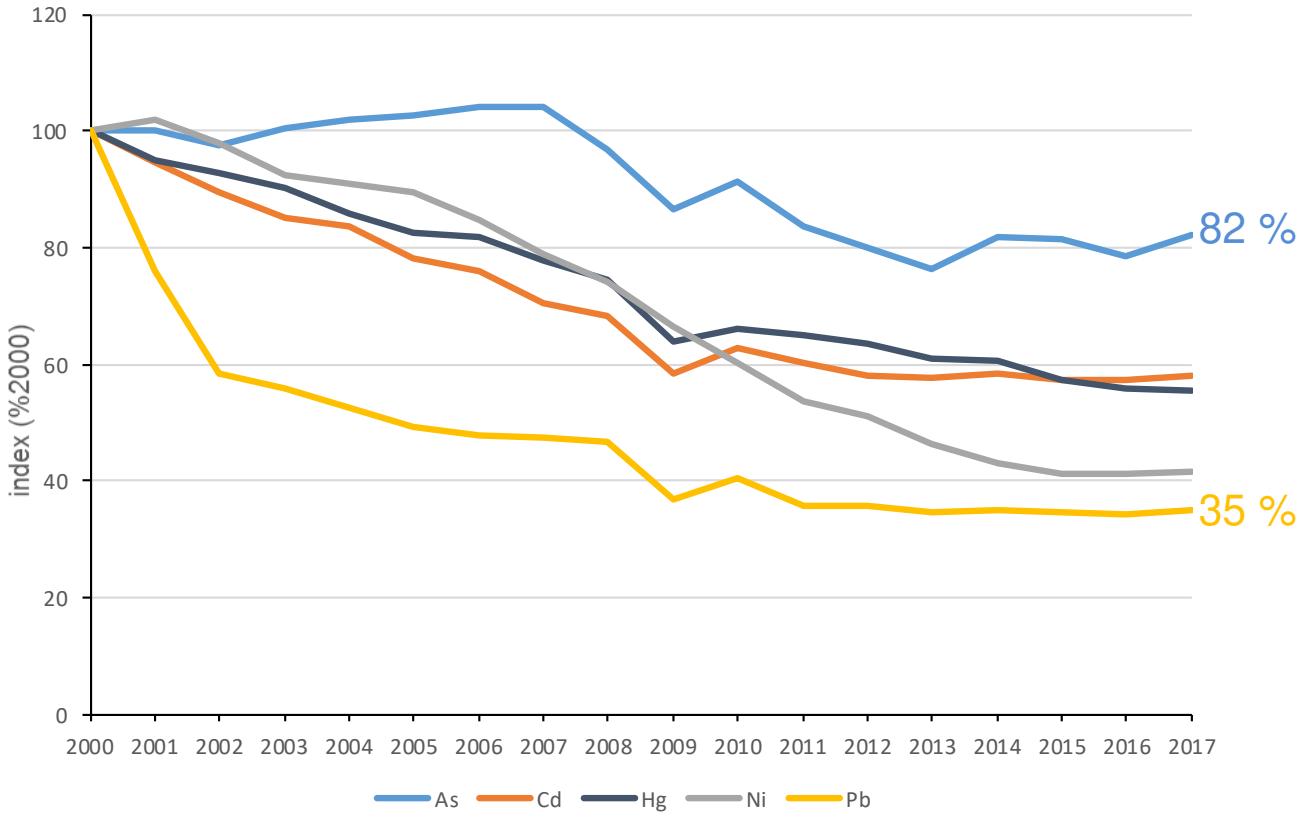
4 reporting stations above CO LV



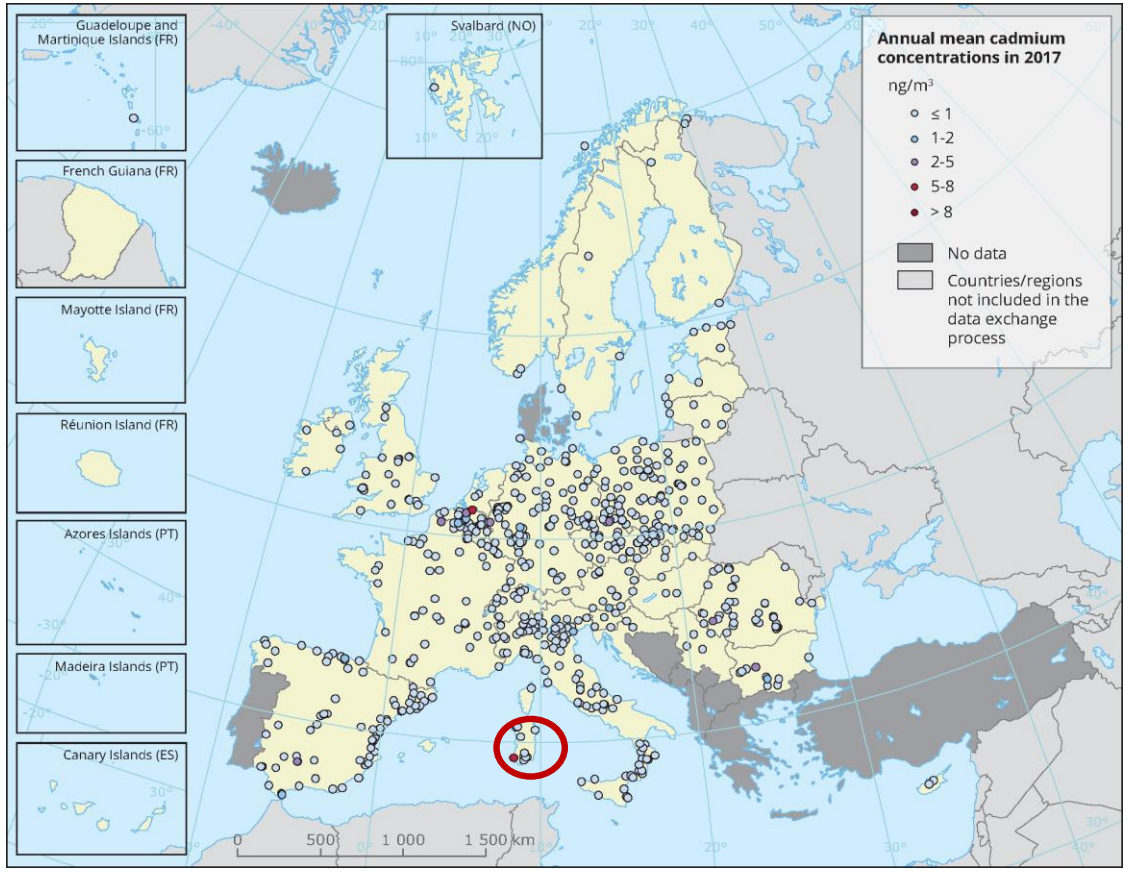
3 reporting stations above C_6H_6 LV

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4. Toxic metals exceedances very localized



EU Member States (2000 – 2017)

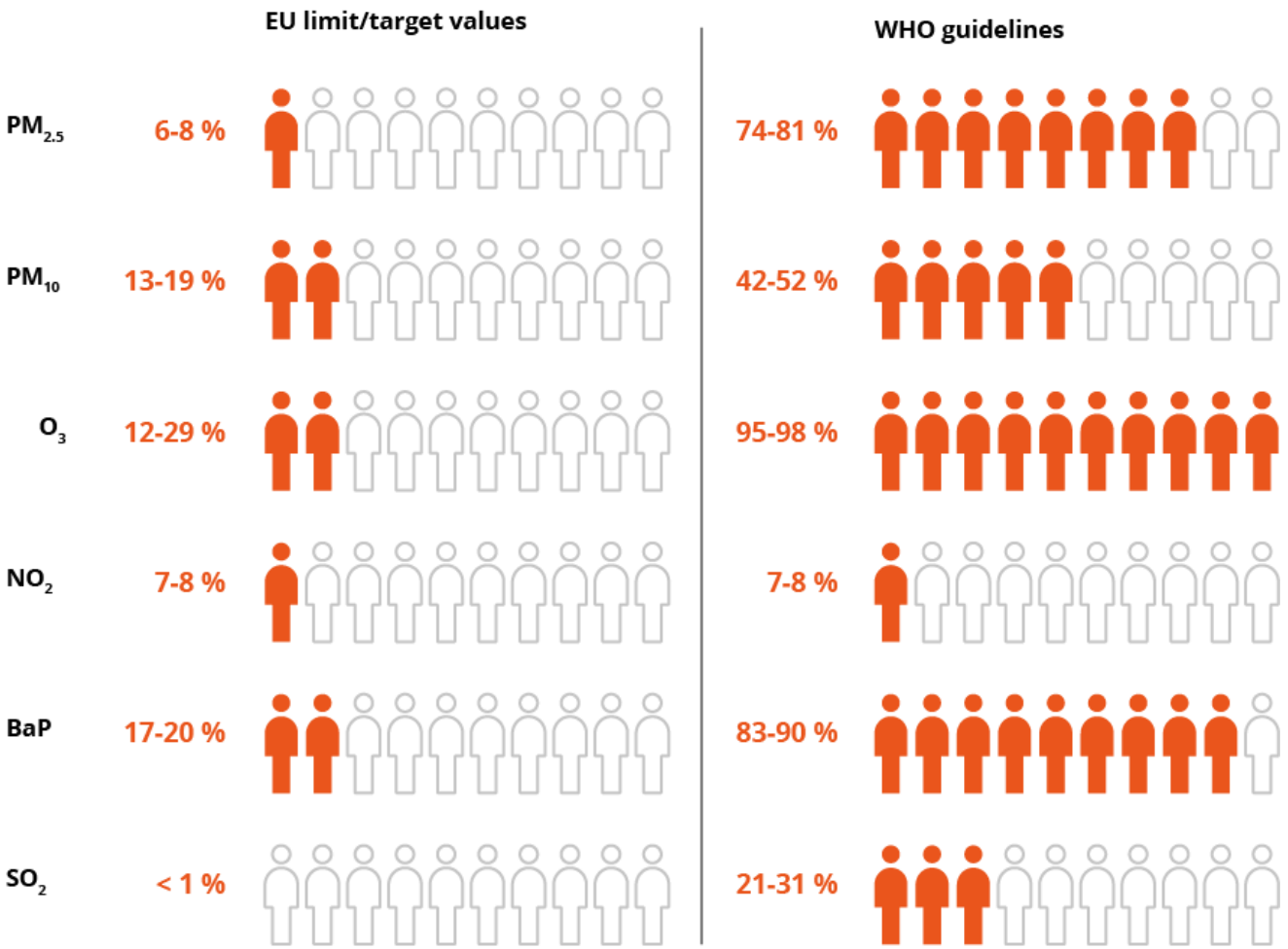


Cd: 1 suburban background station exceeding the TV in Italy

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5. Many Europeans still exposed to harmful levels of air pollution

Share of the EU urban population exposed to air pollutant concentrations above EU and WHO reference values in 2015 - 2017



Air pollution country profile: Italy

Air quality

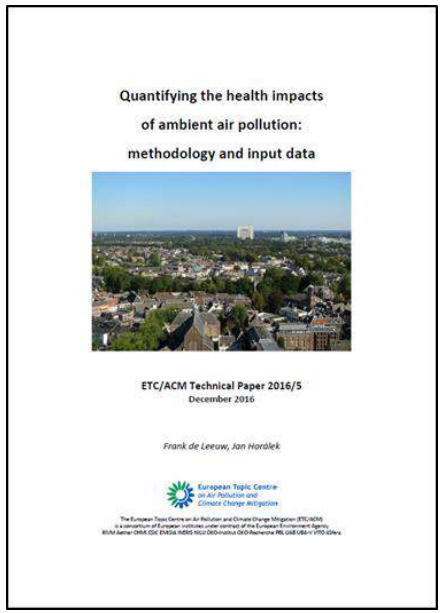
The table below shows the percentage of urban population exposed to concentrations above EU standards for selected air pollutants such as PM_{10}, $PM_{2.5}$, O_3, NO_2 and BaP for the years 2012-2017.

		2013	2014	2015	2016	2017
BaP	annual mean	2.8	1.5	7.8	5.7	6.6
NO2	annual mean	27.5	15.7	27.9	23.2	23.8
O3	percentile 93.15	52.0	25.6	72.5	45.4	62.9
PM10	percentile 90.41	64.9	48.9	64.9	42.5	44.2
PM2.5	annual mean	72.0	27.0	78.3	59.2	75.0

Source: CSI004

European Environment Agency

6. Health impacts of air pollution - latest estimates (2016)


Quantifying the health impacts
of ambient air pollution:
methodology and input data

ETC/ACM Technical Paper 2016/5
December 2016

Frank de Leeuw, Jan Horálek


Air pollution

European Environment Agency

Health impacts of air pollution

Assessing the risks to health from air pollution

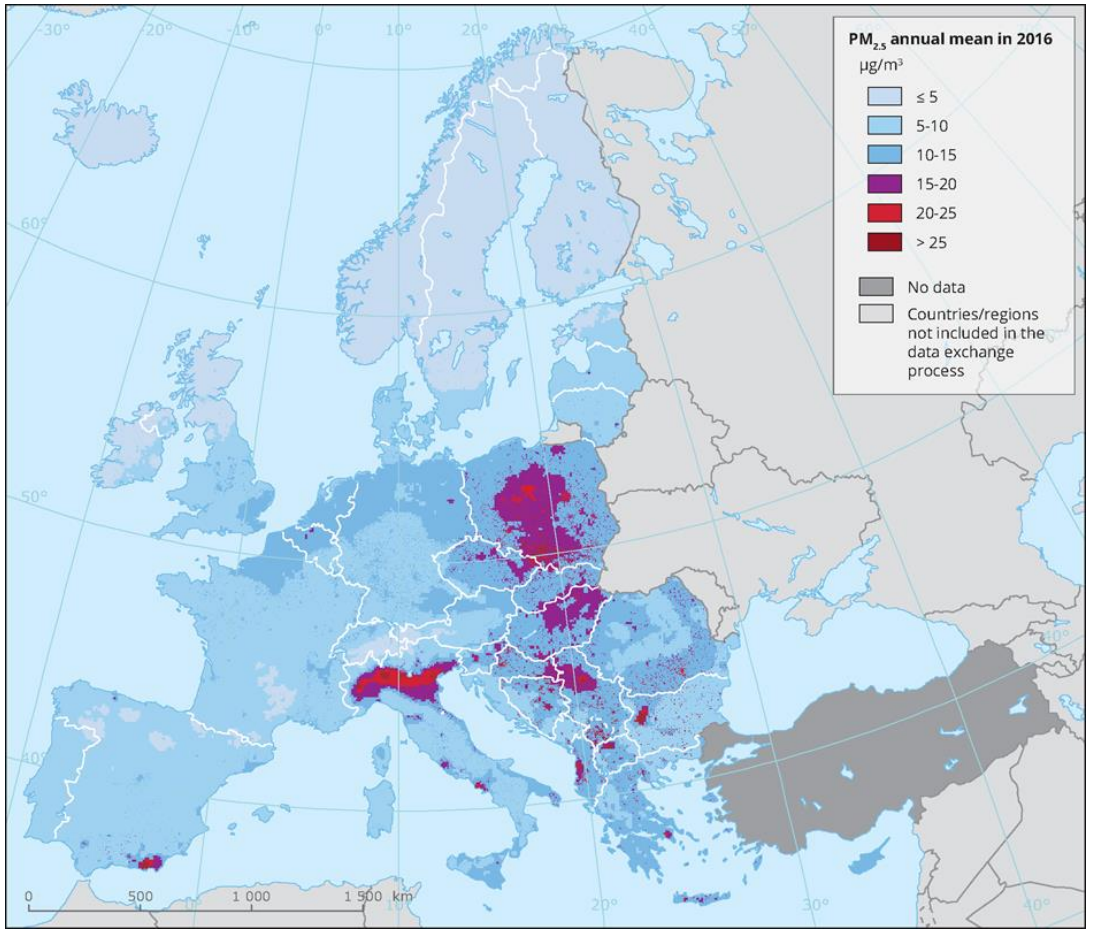
The European Environment Agency (EEA) produces annual air pollution health risk assessments at the European level. These give an objective and comparable estimate of the impacts of air pollution on the population's health. This briefing provides an overview of the methodology followed in the assessments.

Key messages

- The EEA uses the best available air quality data, and information on population and health outcomes at European level to estimate health risk.
- World Health Organization (WHO) recommendations are used in the EEA's assessment. These include the relationships between the concentration of an air pollutant to which a population is exposed and a health outcome (for instance, mortality), and the counterfactual concentrations above which health impacts are considered.
- The estimates are a good indication of the magnitude of the health impacts of air pollution and a solid basis for measuring the impact of policies to improve air quality.
- Health impacts are estimated at population level, rather than for individuals so it is not possible to identify which individuals died because of air pollution.
- The estimated number of premature deaths are a measure of the general impact of air pollution across a given population.

Assessments of the health risk from air pollution estimate and communicate the impact of exposure to air pollution on the population's health. Such assessments may also include the impact of changes in air quality resulting from air quality improvement measures (WHO, 2016).

The European Environment Agency's (EEA) annual health risk assessment is published in the Air Quality in Europe report and aims to:



Source: Eionet Report ETC/ACM 2018/8

6. Health impacts of air pollution - latest estimates (2016)

Table 10.1 Premature deaths attributable to $PM_{2.5}$, NO_2 and O_3 exposure in 41 European countries and the EU-28, 2016

		$PM_{2.5}$		NO_2		O_3	
Country	Population (1 000)	Annual mean (*)	Premature deaths (*)	Annual mean (*)	Premature deaths (*)	SOMO35 (*)	Premature deaths (*)
Austria	8 700	12.0	5 300	18.9	1 000	4 522	270
Belgium	11 311	12.7	7 600	21.7	1 600	2 203	180
Bulgaria	7 154	22.3	13 100	18.8	1 100	3 347	280
Croatia	4 191	19.4	5 300	15.2	260	4 996	190
Cyprus	1 184	13.7	580	24.0	240	5 612	30
Czechia	10 554	16.6	9 600	15.2	240	4 353	350
Denmark	5 707	9.2	2 700	10.4	80	2 293	90
Estonia	1 316	5.9	500	7.8	< 1	1 949	20
Finland	5 487	5.1	1 500	8.0	< 1	1 510	60
France	64 977	10.9	33 200	17.3	7 500	3 420	1 400
Germany	82 176	11.6	59 600	20.2	11 900	3 368	2 400
Greece	10 784	19.6	12 900	19.6	2 900	6 871	640
Hungary	9 830	17.5	12 100	16.6	770	3 952	380
Ireland	4 726	6.8	1 100	11.0	50	1 323	30
Italy	60 666	16.6	58 600	22.1	14 600	6 058	3 000
Latvia	1 969	10.9	1 700	12.0	60	2 773	60
Lithuania	2 889	11.8	2 600	11.7	20	2 456	70
Luxembourg	576	11.4	230	20.7	50	2 211	10
Malta	450	11.1	210	14.9	< 1	5 985	
Netherlands	16 979	11.3	9 200	20.5	1 500	2 428	
Poland	37 967	20.6	43 100	15.2	1 500		
Portugal	9 809	8.3	4 900	15.3	610		
Romania	19 761	16.8	23 400	17.6			490
Slovakia	5 426	17.6	4 800	13.5			
Slovenia	2 064	16.0	1 700				
Spain	44 145	11.1	24 10				1 500
Sweden	9 851	5.7					120
United Kingdom	65 379			21.8		1 161	530
Albania	2 876					5 475	180
Andorra					< 1	4 423	< 5
Bosnia and Herzegovina					20	4 409	120
Iceland				10.1	< 1	499	< 5
Kosovo			800	14.4	20	4 769	100
			20	17.8	< 1	4 945	< 5
		14.3	30	26.8	10	7 186	< 5
		20.3	630	11.9	< 1	5 269	20
North Macedonia	2 071	34.6	3 400	17.4	110	4 434	70
	5 211	5.9	1 300	12.4	130	1 502	50
	33	14.3	30	16.3	< 1	5 667	< 5
	7 076	24.6	13 700	19.4	1 500	3 508	280
Switzerland	8 327	10.1		19.7		4 842	
EU-28	**506 028**	**12.9**	**374 000**	**16.3**	**68 000**	**3 547**	**14 000**
Total	**538 014**	**14.4**	**412 000**	**16.3**	**71 000**	**3 811**	**15 100**

Notes: (*) The annual mean (in µg/m³) and the SOMO35 (in µg/m³ · days), expressed as population-weighted concentration, is obtained according to the methodology described by ETC/ACM (2019) and references therein and not only from monitoring stations.

(*) Total and EU-28 premature deaths are rounded to the nearest thousand (except for O_3, nearest hundred). The national totals are rounded to the nearest hundred or ten.

Around 400 000 premature deaths in Europe each year originating from long-term exposure to PM.

$PM_{2.5}$:

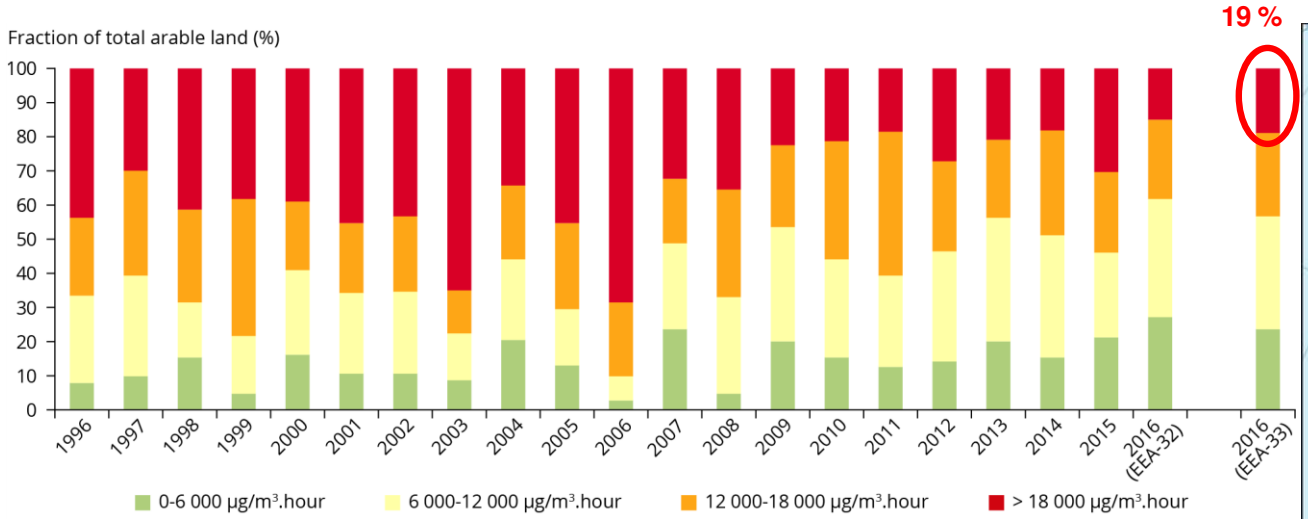
41 countries:	412 000
EU28:	374 000
Italy:	58 600

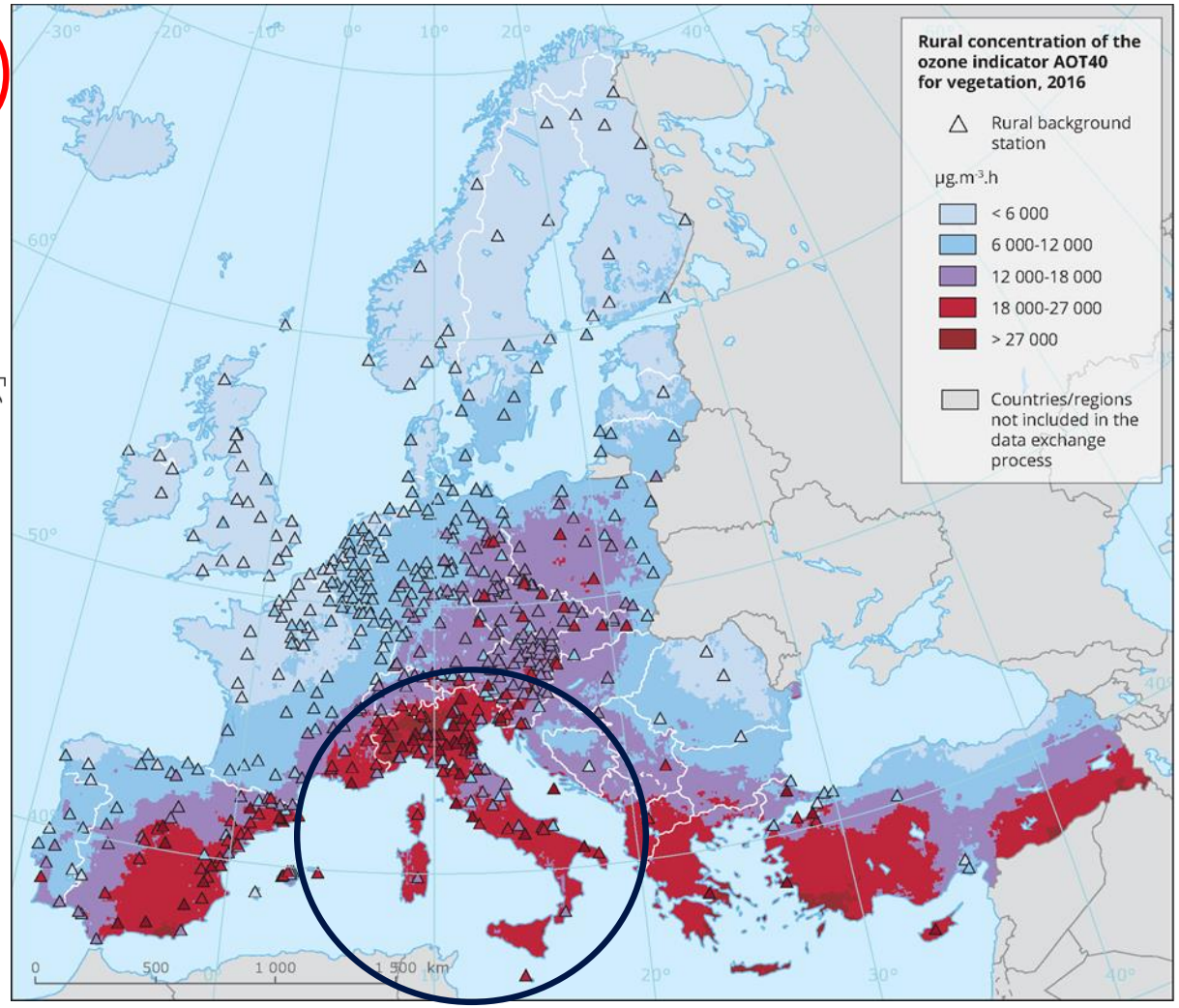
Decrease of at least ~ 30 % premature deaths if $PM_{2.5}$ WHO AQ guideline attained everywhere

EU28:	374 000 → 272 000
41 countries:	412 000 → 290 000

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7. Exposure of vegetation





EEA33 **crops** exposure to ozone

Source: Eionet Report ETC/ACM 2018/8

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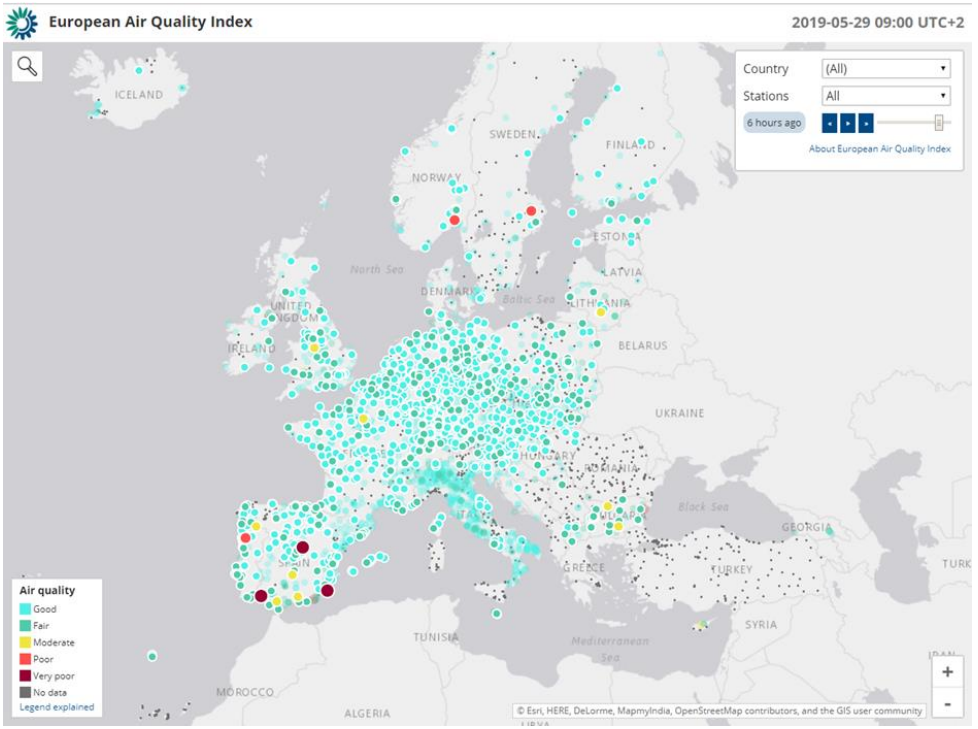
8. Conclusions



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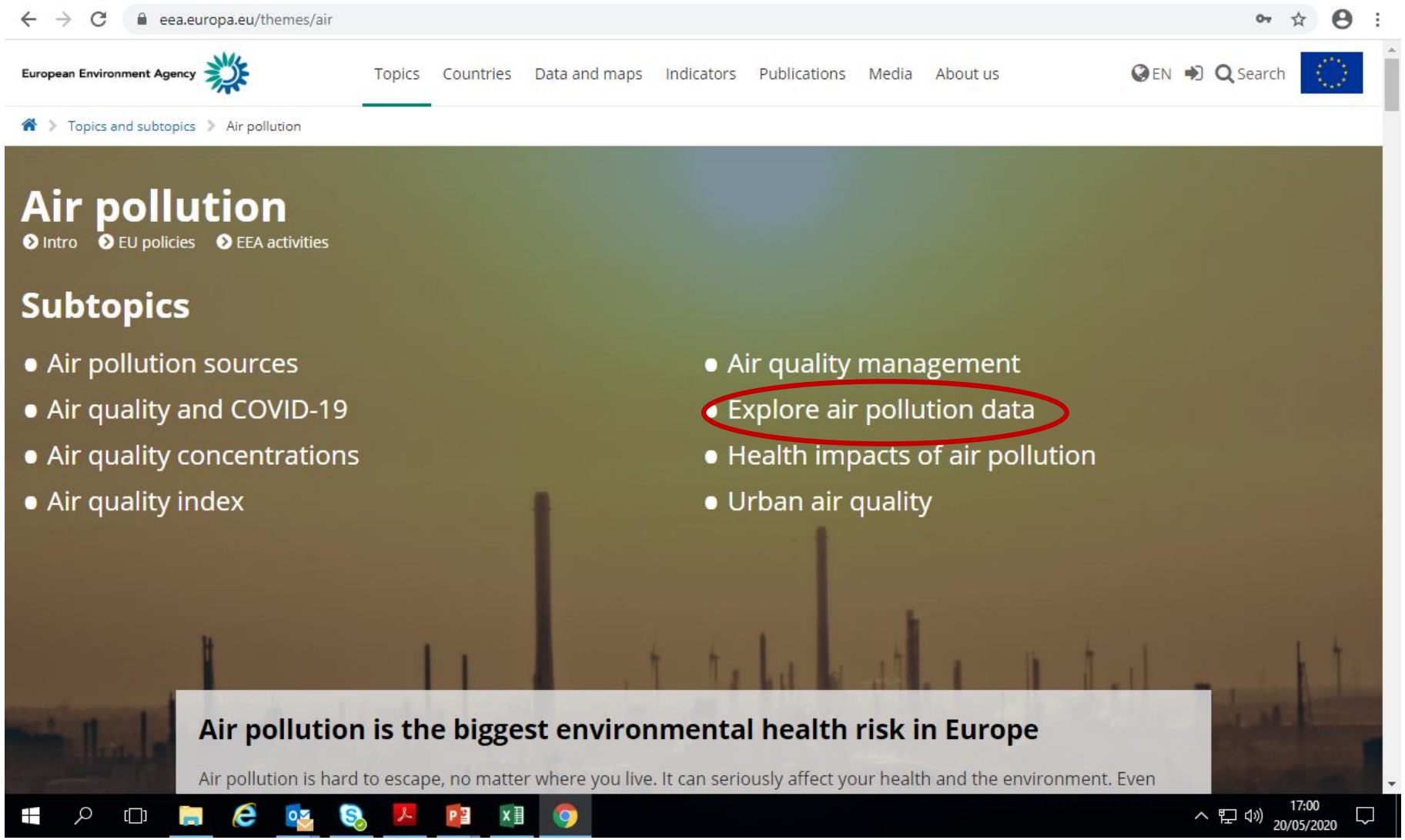
- The emissions of pollutants have decreased in the period 2000–2017.
- The emissions have not decreased at the same pace for all pollutants and for all sectors.
- Concentrations of main pollutants have also declined.
- Still exceedances of legal concentrations and WHO standards
- Persistent impacts on health, vegetation, materials…
- Additional measures are needed especially from agriculture, transport and domestic heating.
- Need for a systemic change in the food, mobility and energy systems.
- Maintain coordination at international, national and local levels.

EEA´s air pollution data

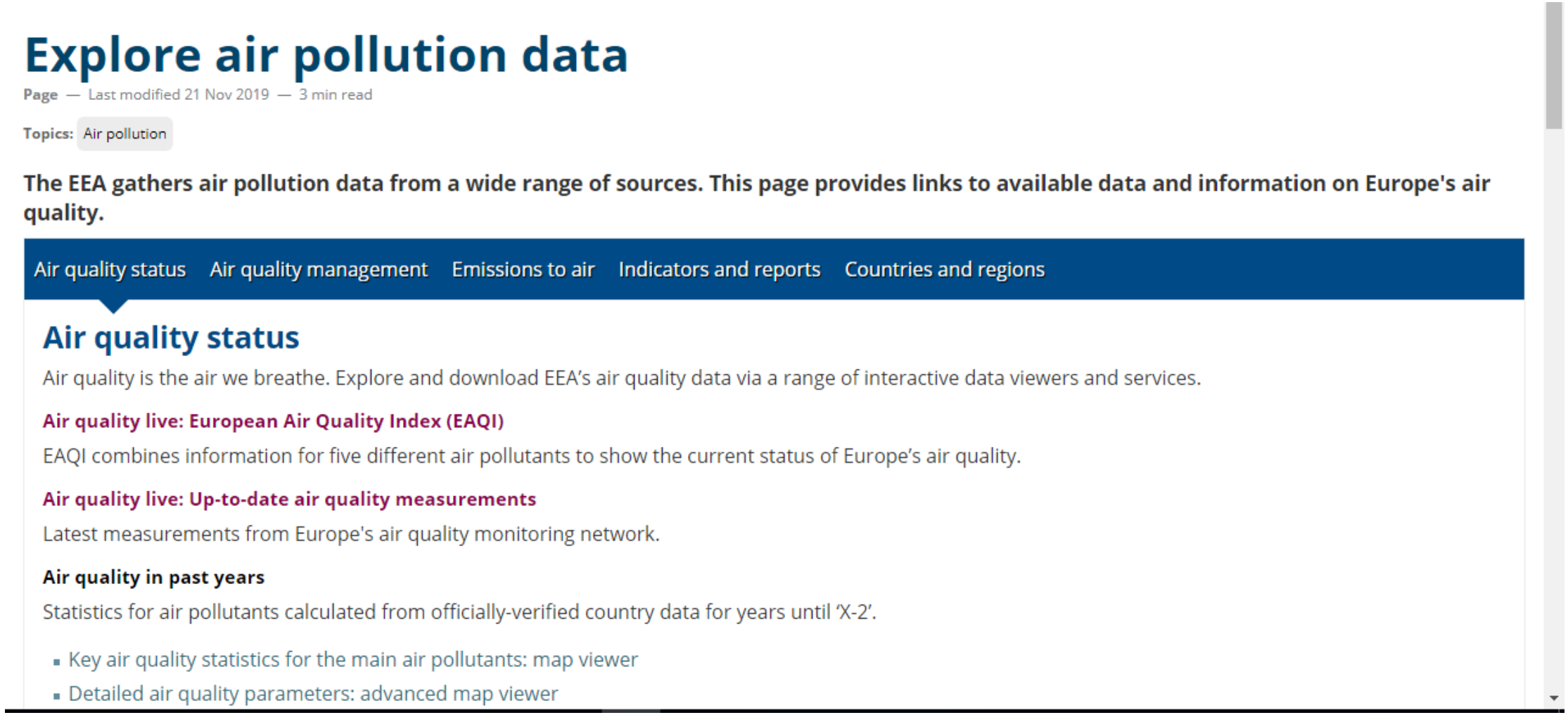


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EEA web page on air



Explore air pollution data



Explore air pollution data

Page — Last modified 21 Nov 2019 — 3 min read

Topics: Air pollution

The EEA gathers air pollution data from a wide range of sources. This page provides links to available data and information on Europe's air quality.

Air quality status | Air quality management | Emissions to air | Indicators and reports | Countries and regions

Air quality status

Air quality is the air we breathe. Explore and download EEA's air quality data via a range of interactive data viewers and services.

Air quality live: European Air Quality Index (EAQI)

EAQI combines information for five different air pollutants to show the current status of Europe's air quality.

Air quality live: Up-to-date air quality measurements

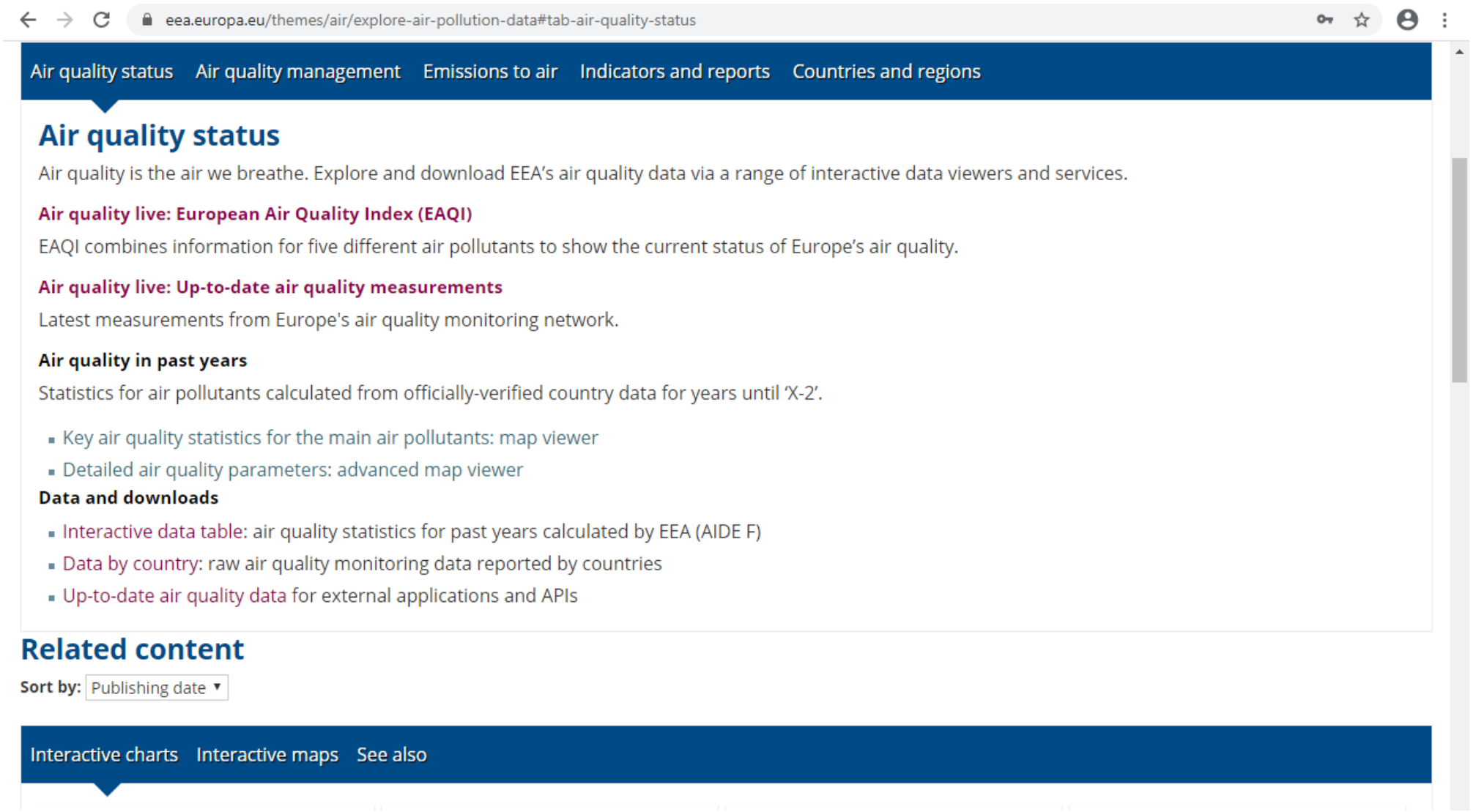
Latest measurements from Europe's air quality monitoring network.

Air quality in past years

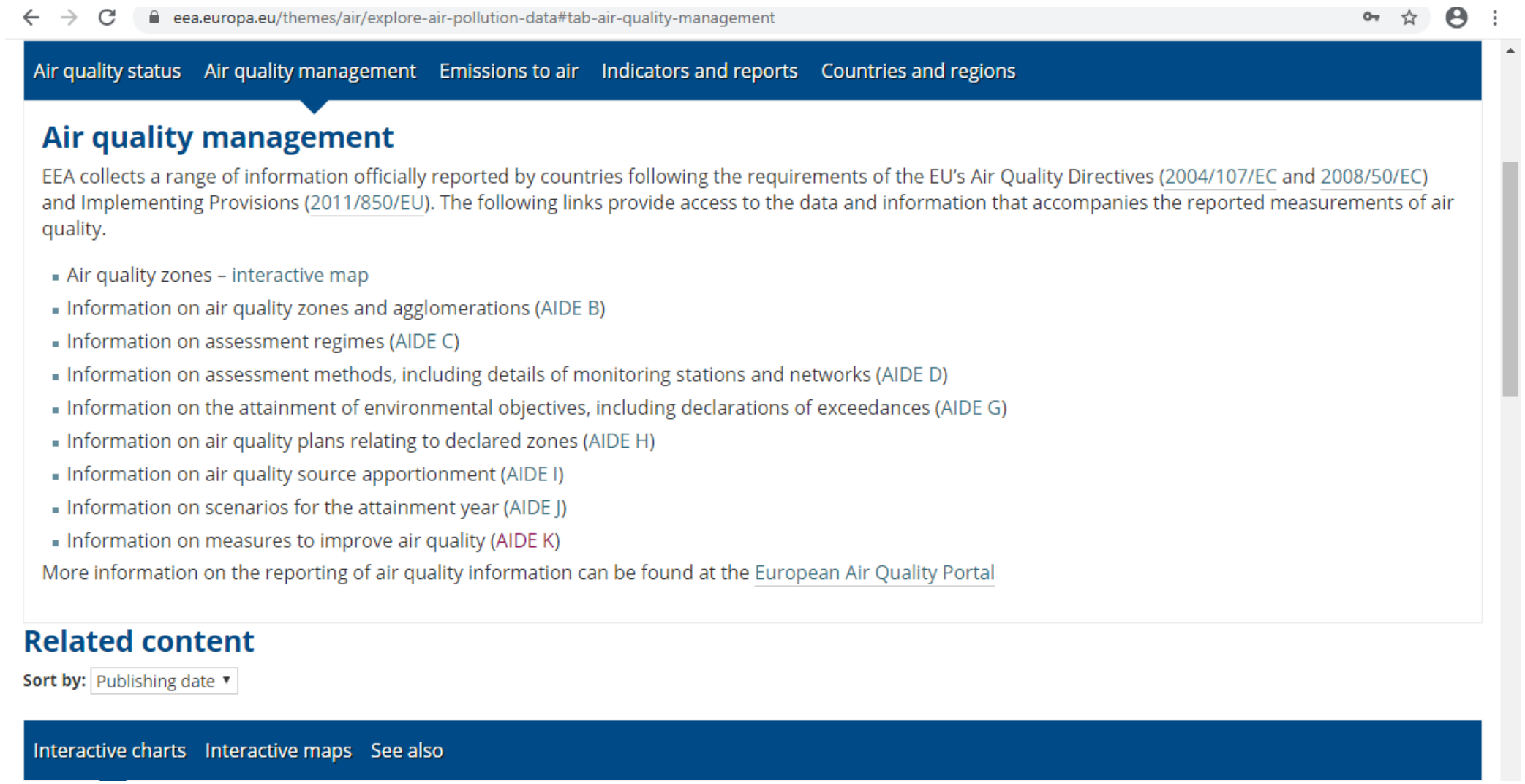
Statistics for air pollutants calculated from officially-verified country data for years until 'X-2'.

- Key air quality statistics for the main air pollutants: map viewer
- Detailed air quality parameters: advanced map viewer

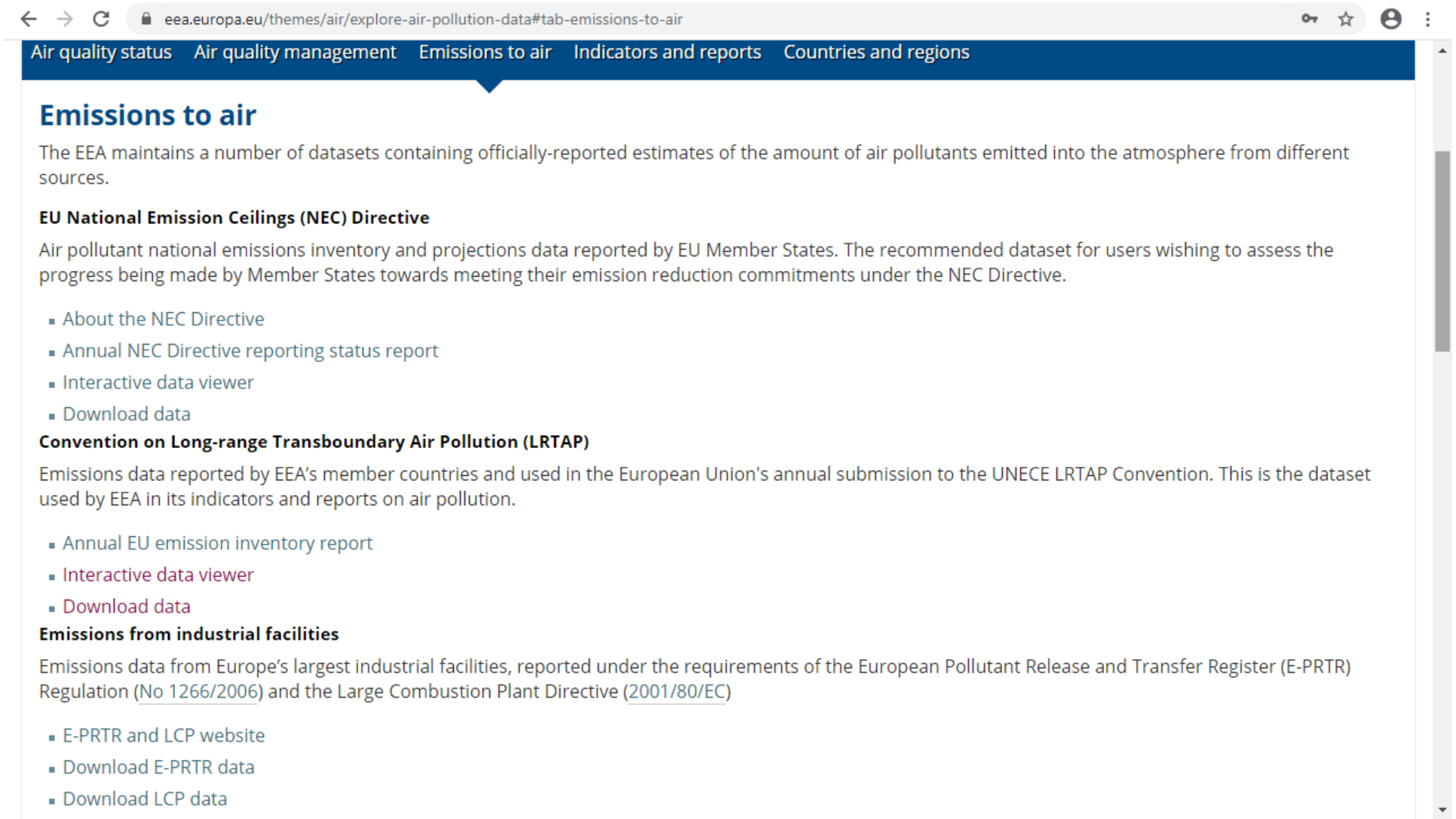
Air quality status



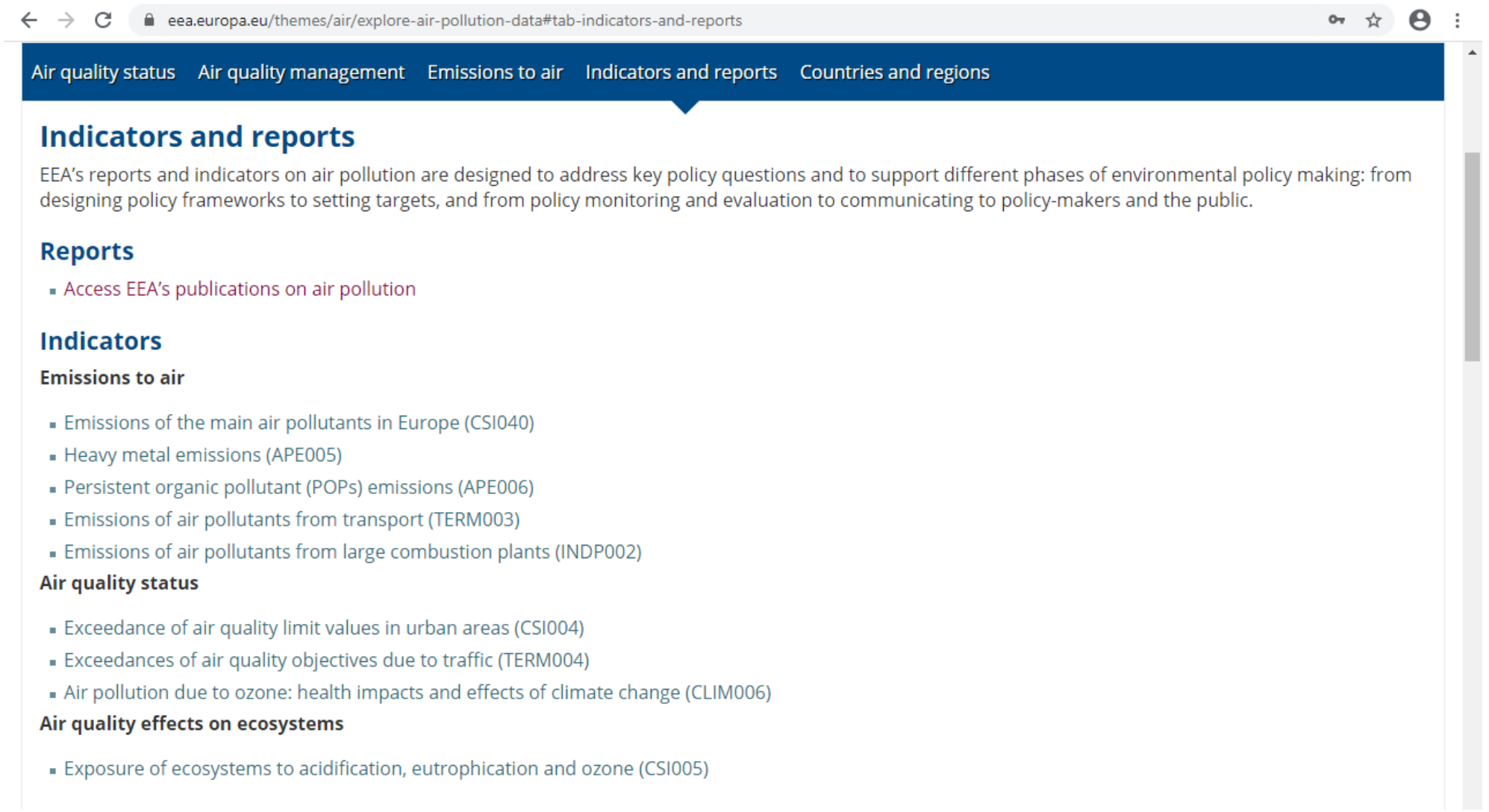
Air quality management



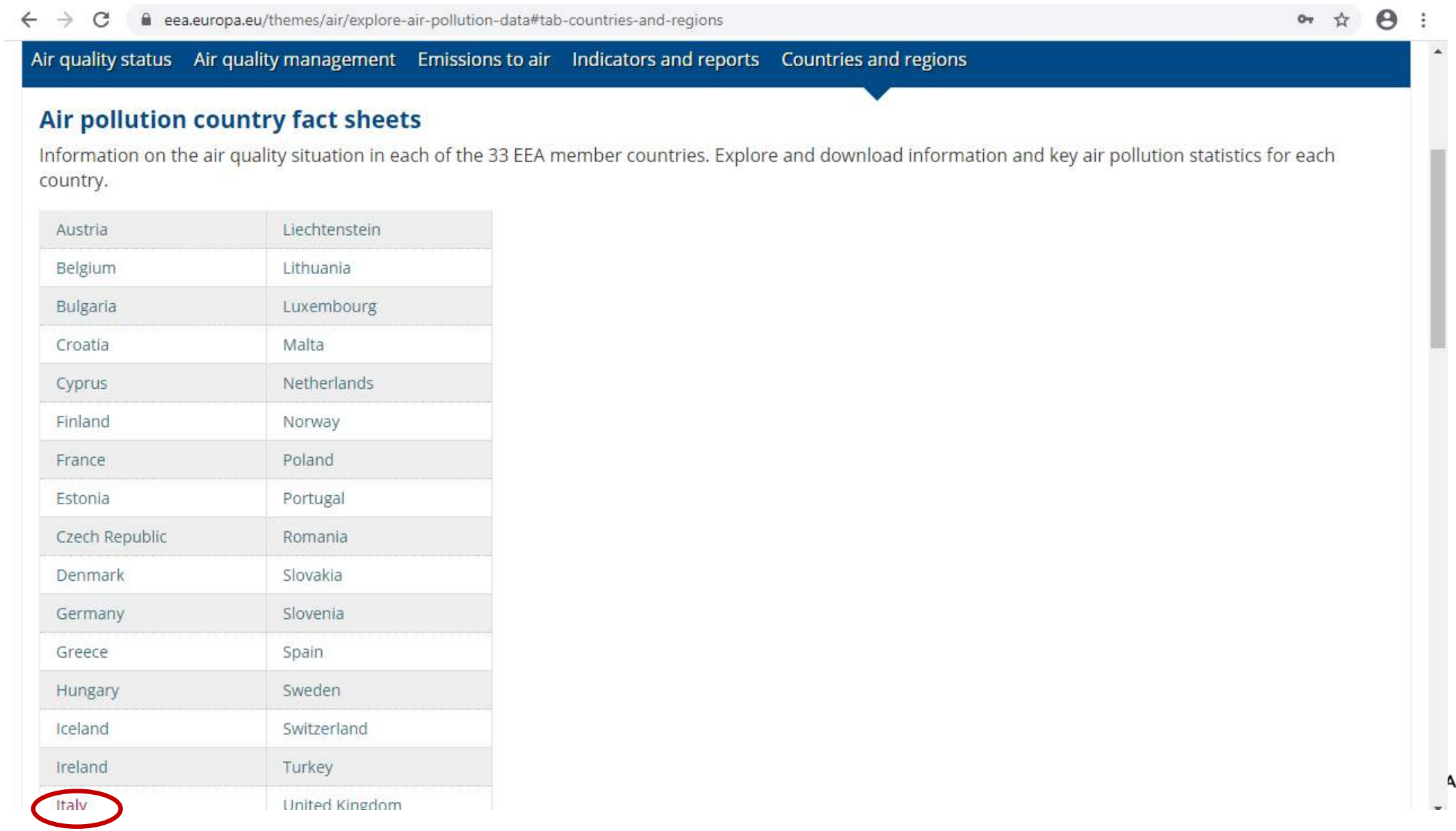
Emissions to air



Indicators and reports



Countries and regions



Agency

Thanks for your attention!!

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