

# Air quality in Europe

## Status and opportunities

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# The European Environment Agency (EEA)

## The EEA is:

- An independent EU agency
- Analysing, assessing and providing information
- An interface between science and policy
- Dependent upon strong country networks to carry out our work

## The EEA is not:

- An environmental regulator checking compliance with environmental laws
- Developing or proposing new legislation
- A funding body



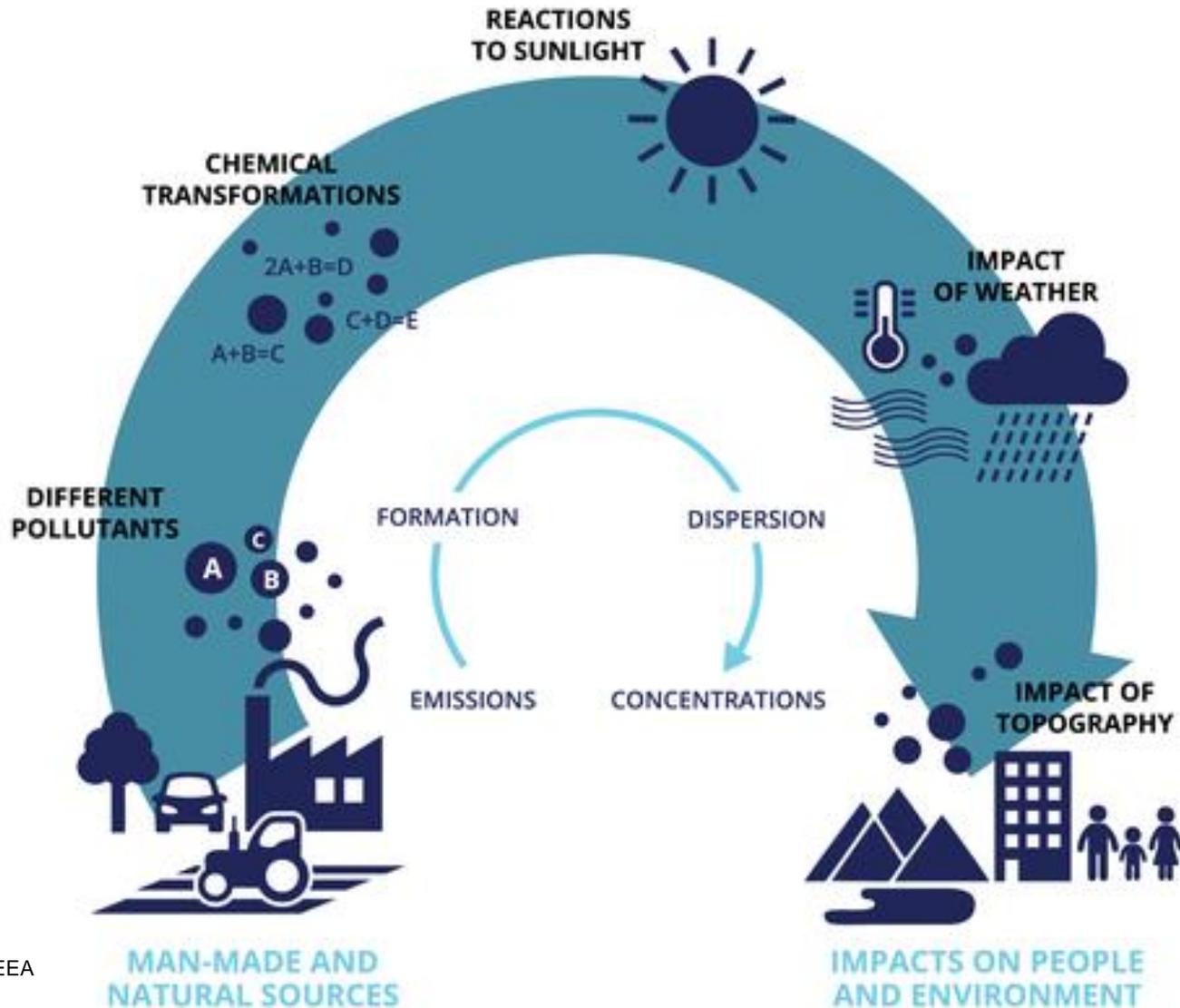
# Air pollution – explaining successes & toward the future



1. Policies are working: Air quality is improving as a direct result of past policies & technological improvements.
2. However, air pollution remains responsible for more than 400 000 premature deaths in Europe each year. It continues to damage vegetation and ecosystems.
3. Effective air quality policies require action and cooperation at different scales: pan-European, national and local/city levels.
4. Systemic solutions must increasingly be found to move toward air quality consistent with the WHO AQ guidelines, and achieve the EU's 2050 vision of “living well within the limits of the planet”.



# Air pollution – a complex issue



Source: EEA



# Many Europeans are still exposed to harmful levels of air pollution

EU urban population exposed to harmful levels of air pollutant concentrations in 2012–2014, according to:

	EU limits/target values	WHO guidelines
PM <sub>2.5</sub>	8–12 % 	85–91 % 
PM <sub>10</sub>	16–21 % 	50–63 % 
O <sub>3</sub>	8–17 % 	96–98 % 
NO <sub>2</sub>	7–9 % 	7–9 % 
BaP	20–24 % 	88–91 % 
SO <sub>2</sub>	< 1 % 	35–49 % 

# Health impacts from air pollution - latest estimates

## EU-28:

- Around 400 000 premature deaths occur each year due to long-term exposure to PM.
- An estimated 70 000 deaths occur from exposure to NO<sub>2</sub>

## Denmark:

- An estimated 3 000 premature deaths occur annually from exposure to PM & NO<sub>2</sub>



EEA Air Quality in Europe – 2016 report

Country	Population	PM <sub>2.5</sub>		NO <sub>2</sub>	
		Annual mean (*)	Premature deaths	Annual mean (*)	Premature deaths
Austria	8 451 860	15.7	6 960	19.3	910
Belgium	11 161 642	16.6	10 050	23.6	2 320
Bulgaria	7 284 552	24.1	13 700	16.5	570
Croatia	4 262 140	16.8	4 820	15.8	160
Cyprus	865 878	17.1	450	7.3	< 5
Czech Republic	10 516 125	19.6	12 030	17.1	330
Denmark	5 602 628	9.6	2 890	13.0	60
Estonia	1 320 174	7.8	690	10.8	< 5
Finland	5 426 674	5.9	1 730	9.4	< 5
France	63 697 865	14.5	45 120	18.7	8 230
Germany	80 523 746	14.2	73 400	20.4	10 610
Greece	11 003 615	19.7	13 730	14.6	1 490
Hungary	9 908 798	18.2	12 890	16.8	390
Ireland	4 591 087	9.2	1 520	11.6	30
Italy	59 685 227	18.2	66 630	24.5	21 040
Latvia	2 023 825	12.8	2 080	13.7	110
Lithuania	2 971 905	13.9	3 170	11.5	< 5
Luxembourg	537 039	14.3	280	23.4	80
Malta	421 364	12.5	230	12.0	< 5
Netherlands	16 779 575	14.3	11 530	21.3	1 820
Poland	38 062 535	22.8	48 270	16.1	1 610
Portugal	9 918 548	10.0	6 070	14.0	150
Romania	20 020 074	18.5	25 330	17.9	1 900
Slovakia	5 410 836	20.1	5 620	16.0	< 5
Slovenia	2 058 821	17.4	1 960	17.6	150
Spain	44 454 505	11.0	23 940	18.0	4 280
Sweden	9 555 893	6.0	3 020	11.5	< 5
United Kingdom	63 905 297	11.8	37 930	22.8	11 940
Albania	2 874 545	20.3	2 010	15.9	10
Andorra	76 246	11.9	40	14.3	< 5
Bosnia and Herzegovina	3 839 265	16.0	3 620	15.7	80
former Yugoslav Republic of Macedonia	2 062 294	30.4	3 360	20.8	210
Iceland	321 857	6.5	80	14.3	< 5
Kosovo (*)	1 815 606	28.0	3 530	19.3	230
Liechtenstein	36 838	11.4	20	22.7	10
Monaco	36 136	13.8	20	23.2	10
Montenegro	620 893	17.1	600	17.2	30
Norway	5 051 275	7.1	1 590	14.4	170
San Marino	33 562	15.1	30	15.4	< 5
Serbia	7 181 505	21.1	10 730	20.2	1 340
Switzerland	8 039 060	13.9	4 980	22.4	1 140
<b>Total (*)</b>			<b>467 000</b>		<b>71 000</b>
<b>EU-28 (*)</b>			<b>436 000</b>		<b>68 000</b>



# Air pollution causes real economic costs



Direct economic damage - EUR 15 billion from workdays lost.

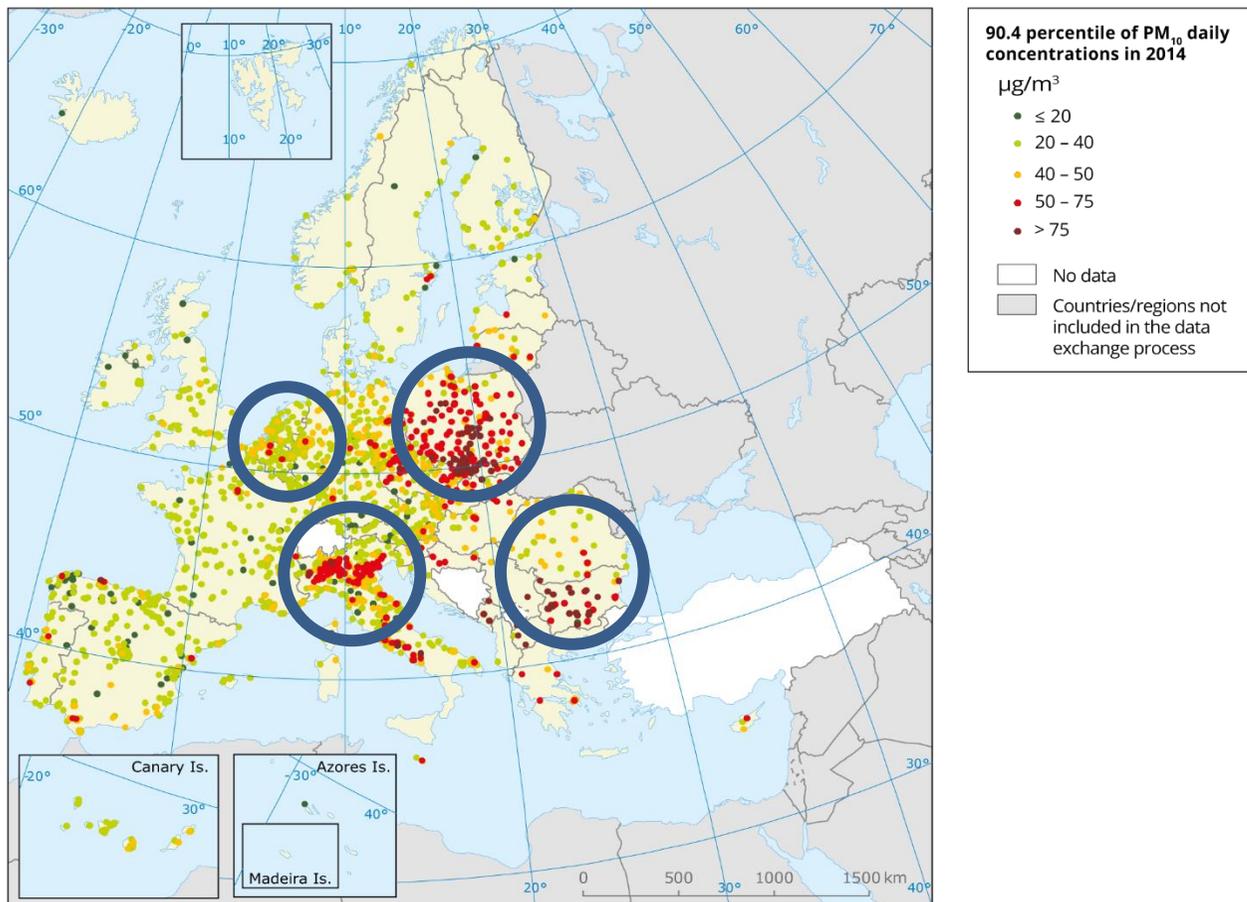
Direct economic damage - EUR 4 billion in healthcare cost.

Direct economic damage - EUR 3 billion crop yield loss.

Damage cost of premature mortality – at least EUR 330 billion.

Source: European Commission (for 2010)

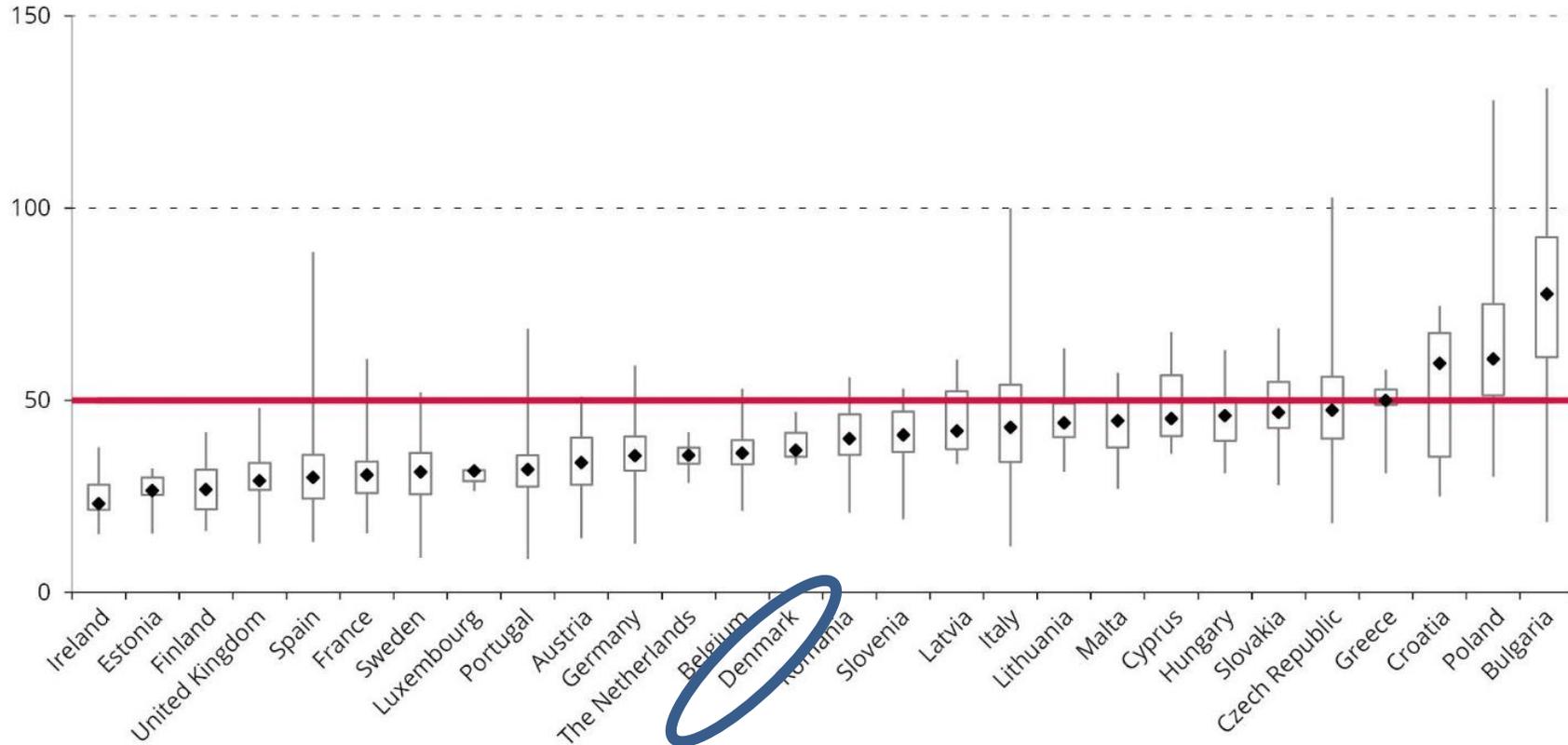
# Particulate matter (PM<sub>10</sub>) concentrations systematically exceed EU standards across large parts of Europe



- There remain persistent exceedances of the 2005 EU air quality standard for PM<sub>10</sub>.
- In 2014, 20 Member States reported exceedances.
- PM contributes most to premature deaths from air pollution in the EU – more than 400 000 each year.

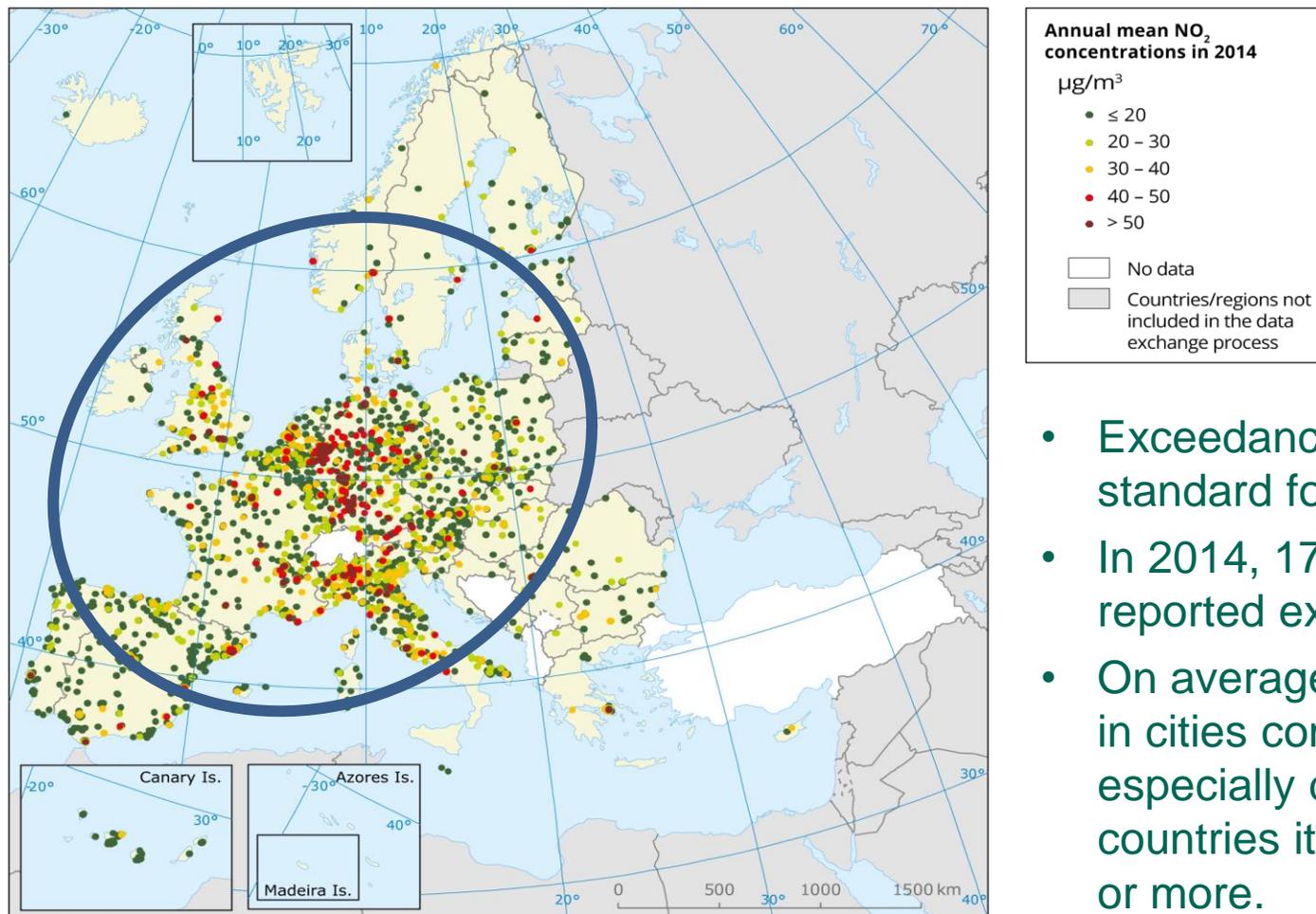
# Air quality status – particulate matter PM<sub>10</sub>, EU Member States (2014)

Concentration (ug / m<sup>3</sup>)



Attainment of PM<sub>10</sub> daily limit value (EU-28)

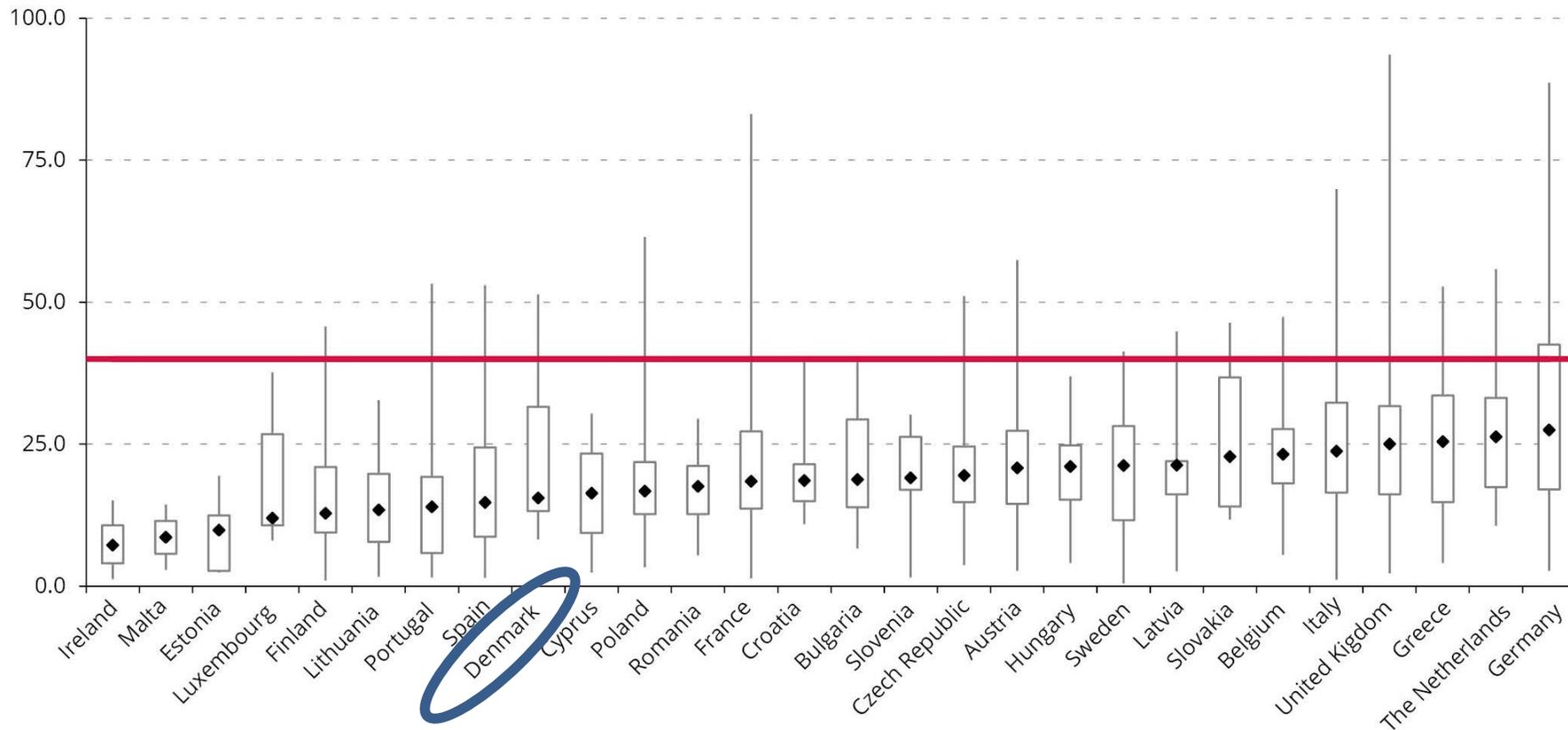
# Nitrogen dioxide (NO<sub>2</sub>) harms the respiratory and cardiovascular systems



- Exceedances of the EU air quality standard for NO<sub>2</sub> are widespread.
- In 2014, 17 Member States reported exceedances.
- On average, around 60% of NO<sub>2</sub> in cities comes from road traffic, especially diesel vehicles. In some countries it is much higher – 80% or more.

# Air quality status – nitrogen dioxide (NO<sub>2</sub>), EU-28, 2014

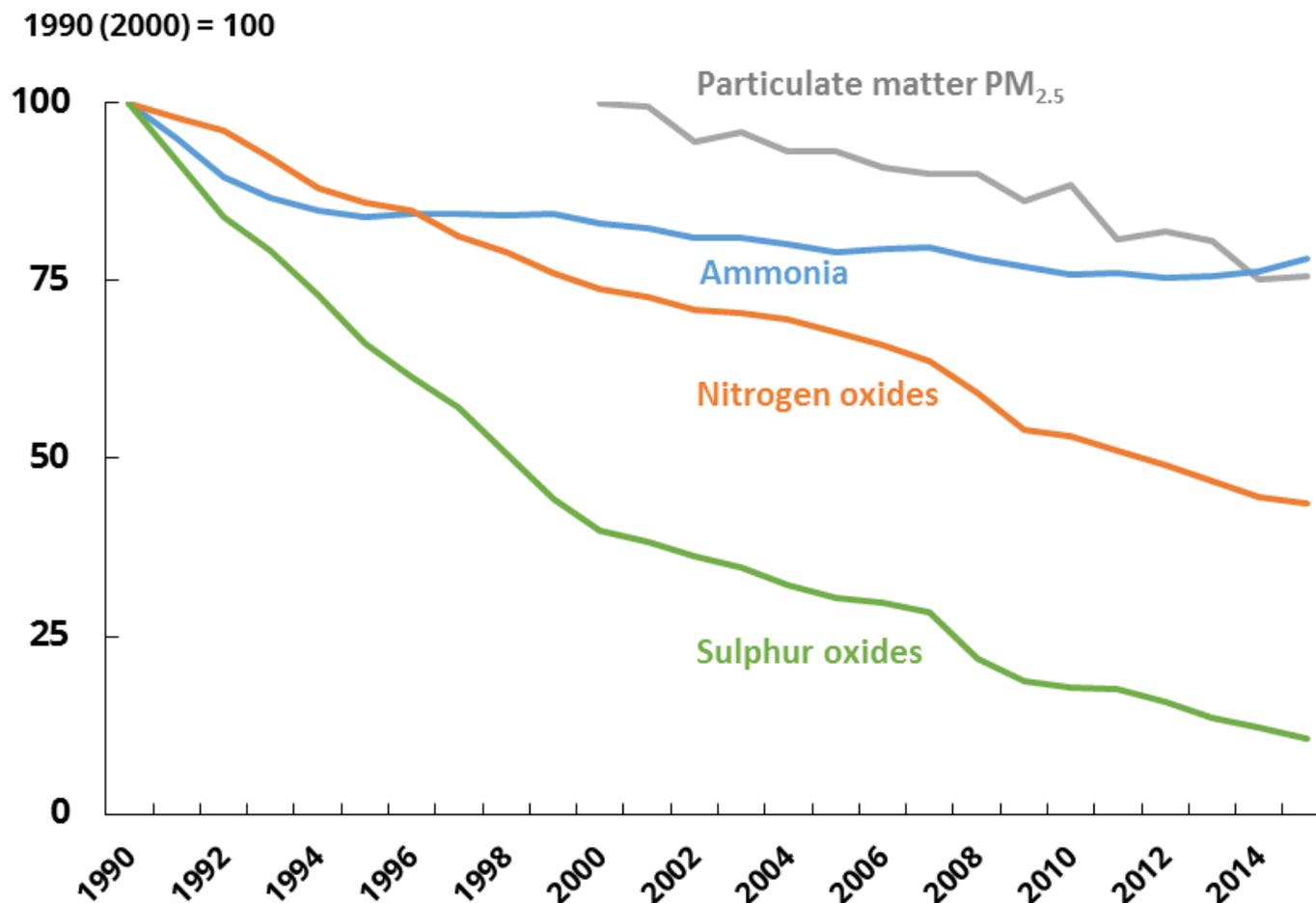
Concentration (ug / m<sup>3</sup>)



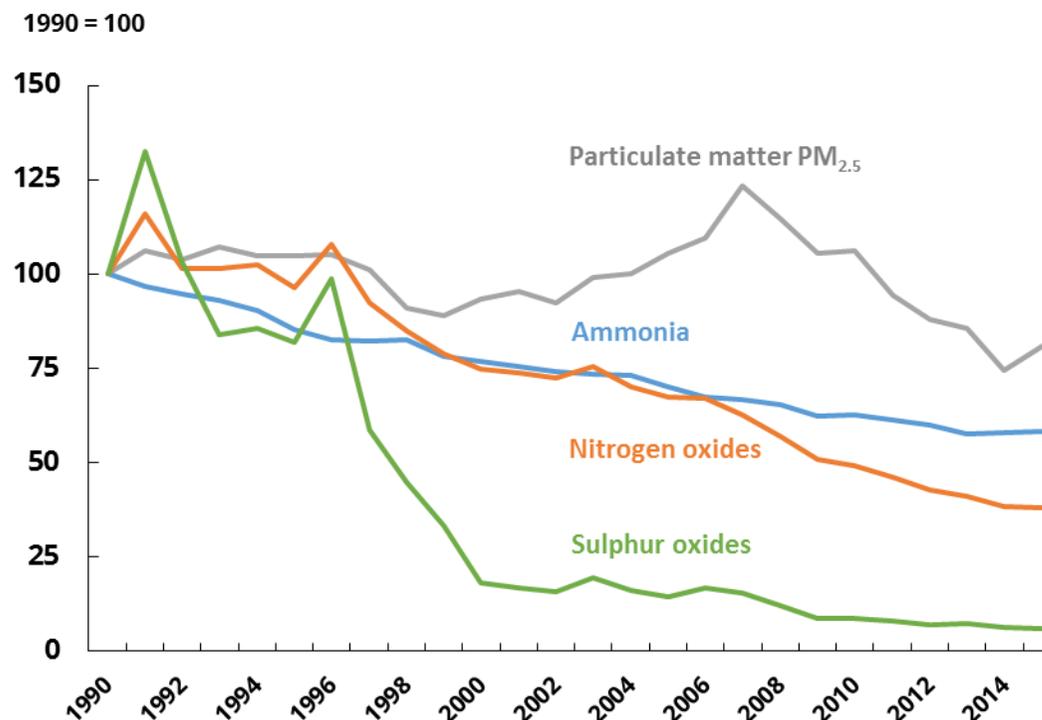
Attainment of annual limit value of NO<sub>2</sub> (EU-28)

Source: EEA Air Quality in Europe – 2016 Report

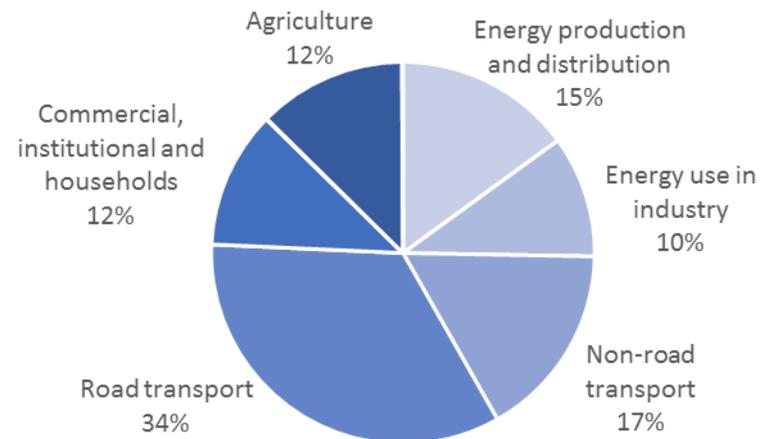
# Air pollutant emissions – EU-28 overview



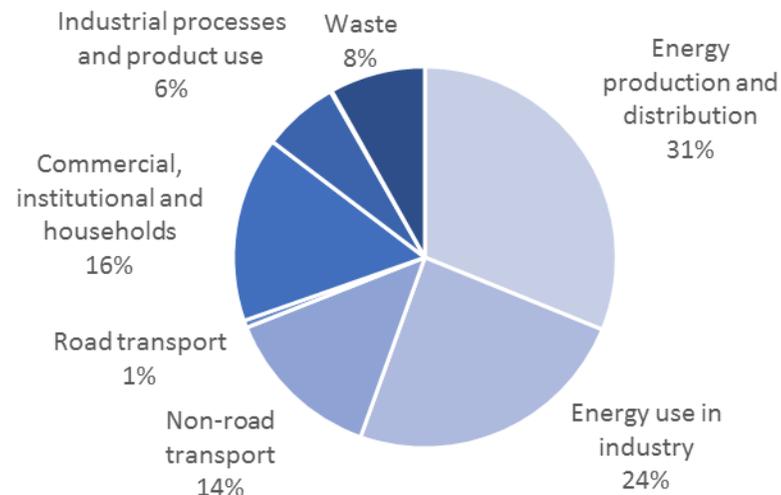
# Sources of air pollution – Denmark



## Nitrogen oxides (NO<sub>x</sub>)



## Sulphur oxides (SO<sub>x</sub>)



Trends: EEA provisional data Mar2017. Excl Greece.  
Sources: EEA EU LRTAP Convention report 2016

# The European Union's approach to managing air pollution

The European Union aims to “achieve levels of air quality that do not result in unacceptable impacts on, and risks to, human health and the environment”.

EU air pollution policy follows a twin-track approach:

1. Setting legal limits for concentrations of air pollutants and,
2. Establishing agreements and standards to reduce emissions at source i.e.
  - i. National emission reduction commitments (total emissions)
  - ii. Sector-specific sources e.g.
    - i. Exhaust emission limits for road vehicles, non-road mobile machinery
    - ii. Industrial Emissions Directive (BREFs - BAT),
    - iii. Medium Combustion Plant Directive,
    - iv. Product standards (e.g. eco-labelling for stoves),
    - v. Fuel quality standards – road, shipping.



# Current and future EU emission reduction commitments

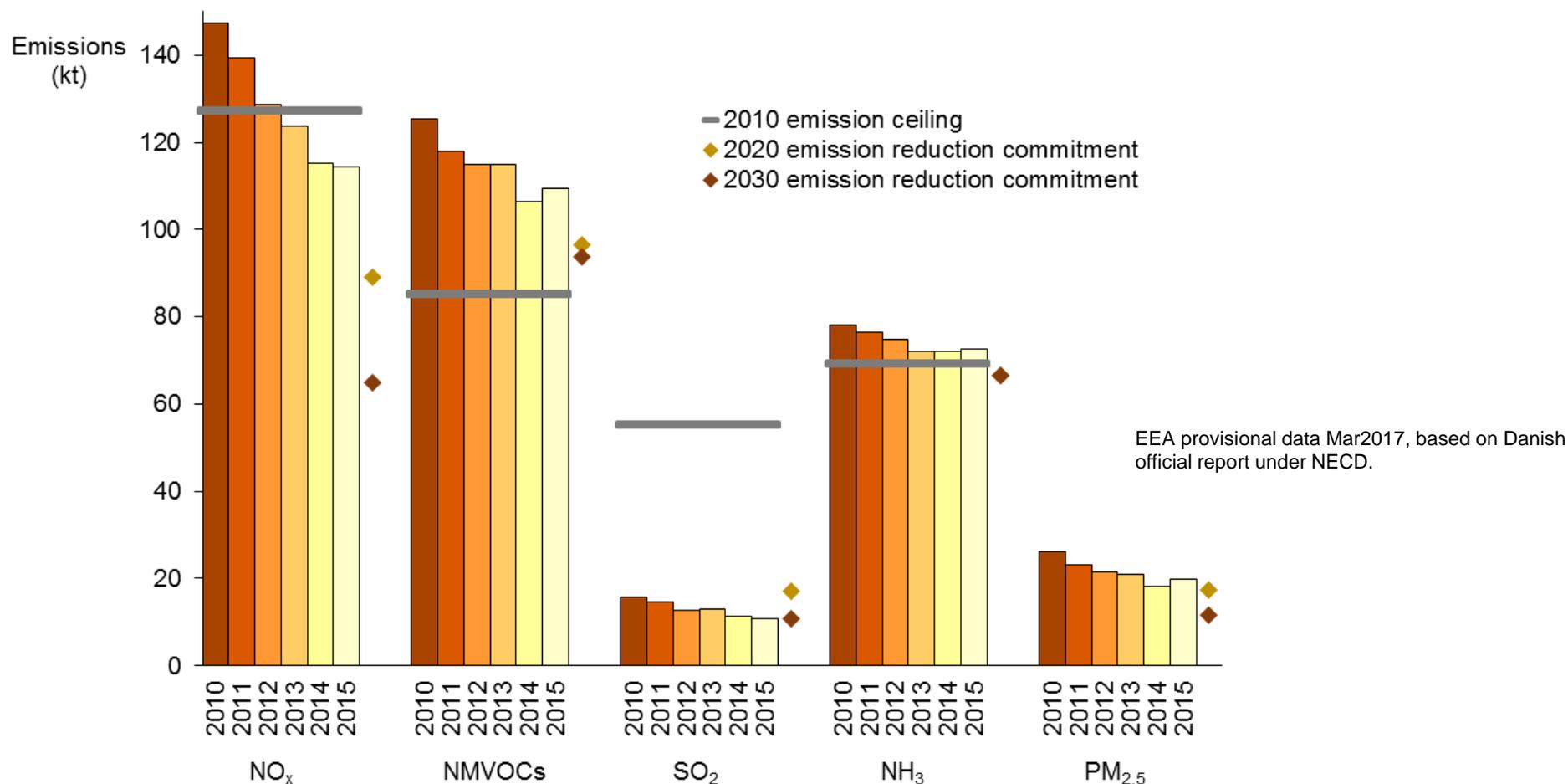
A revised EU 'National Emissions Ceilings Directive' (NECD) was agreed in December 2016

*(Direktiv (EU) 2016/2284 af 14. december 2016 om nedbringelse af nationale emissioner af visse luftforurenende stoffer)*

- The Directive updates the earlier 2001 NECD
- The current 2010 ceilings remain in force until 2019.
- New emission reduction commitments for 2020 and 2030.
- Member States decide the sectors & measures from where the required future emission reductions will come



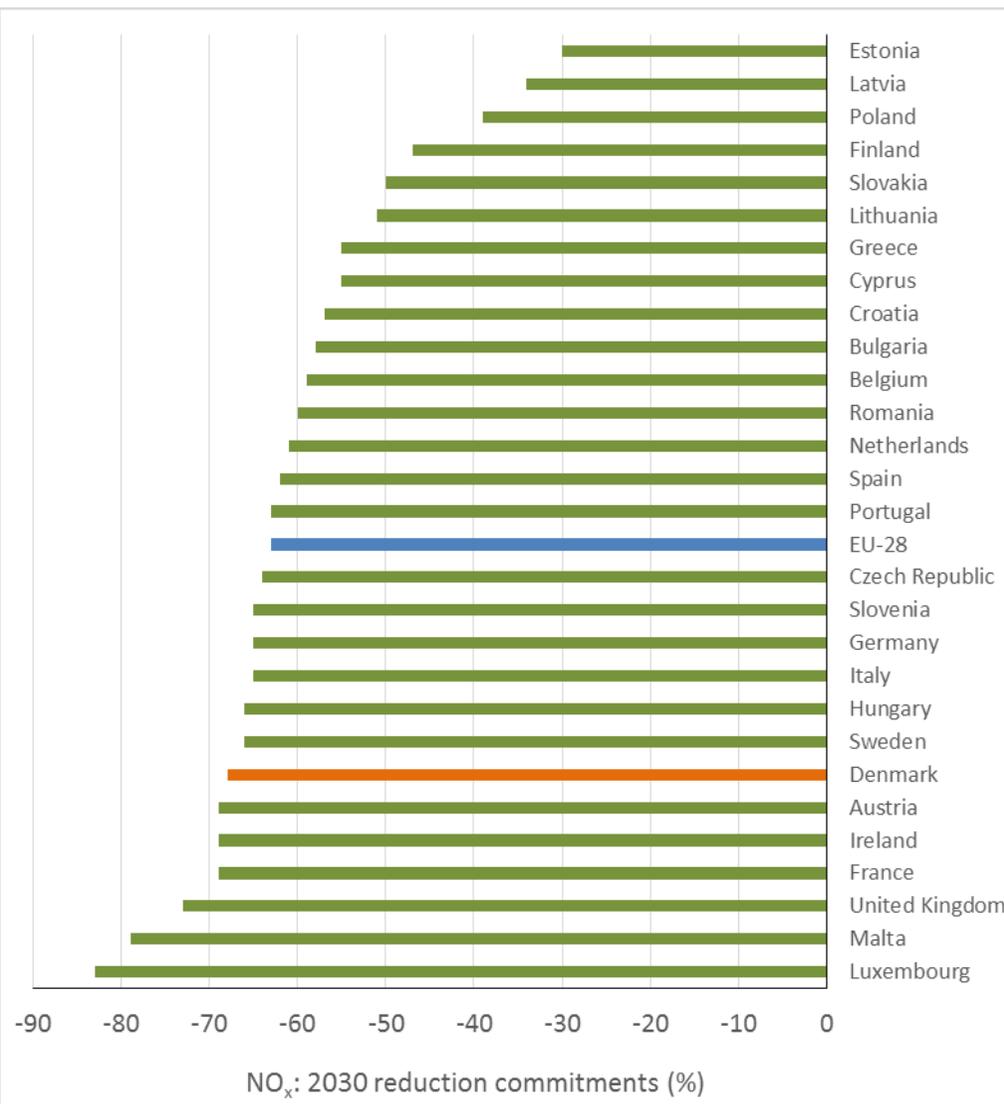
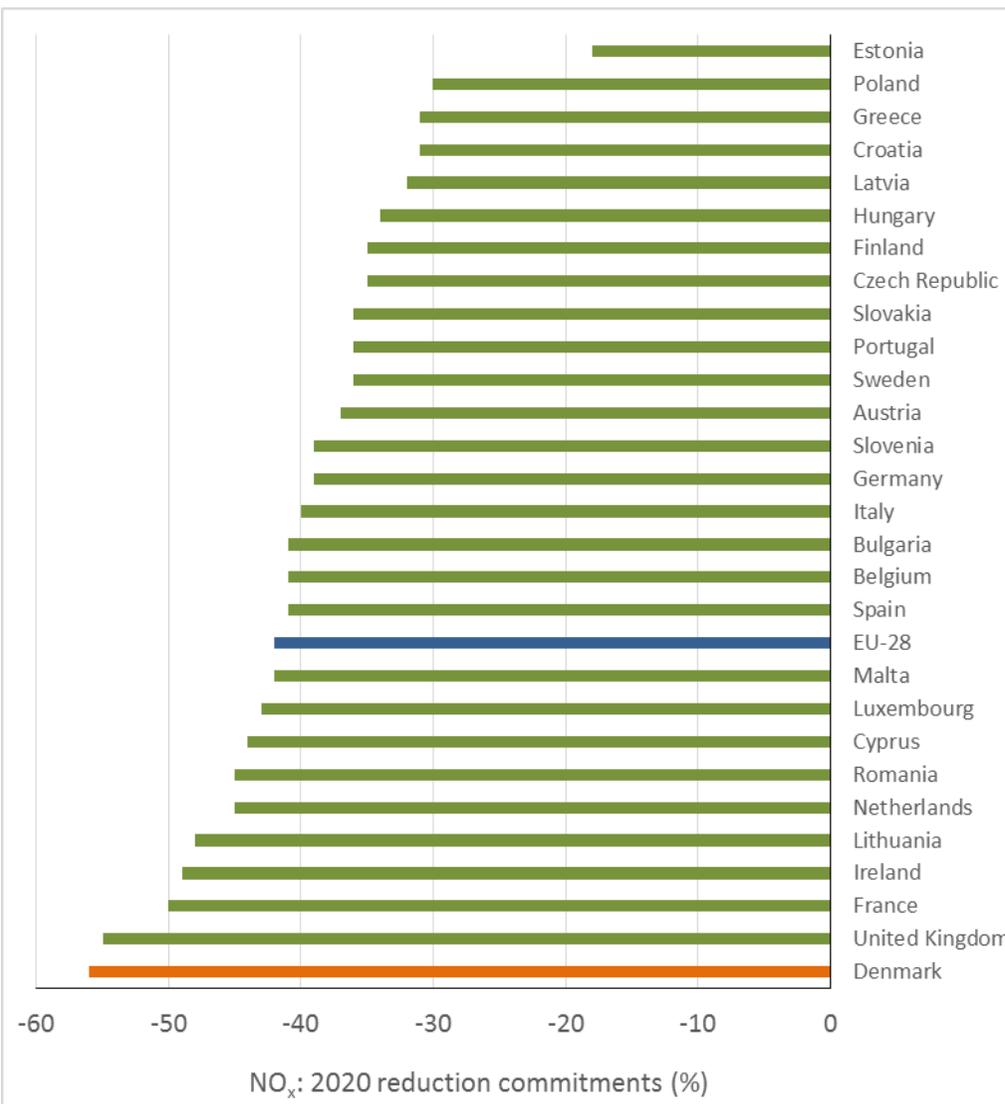
# Denmark: NECD current & future emission reduction commitments



- Note that Denmark has formally applied to 'adjust' some of its reported emissions downwards for compliance purposes in accordance with the flexibility provisions of the new NECD. This application has not yet been reviewed or approved by the European Commission. If approved, the number of exceedances illustrated will decrease.

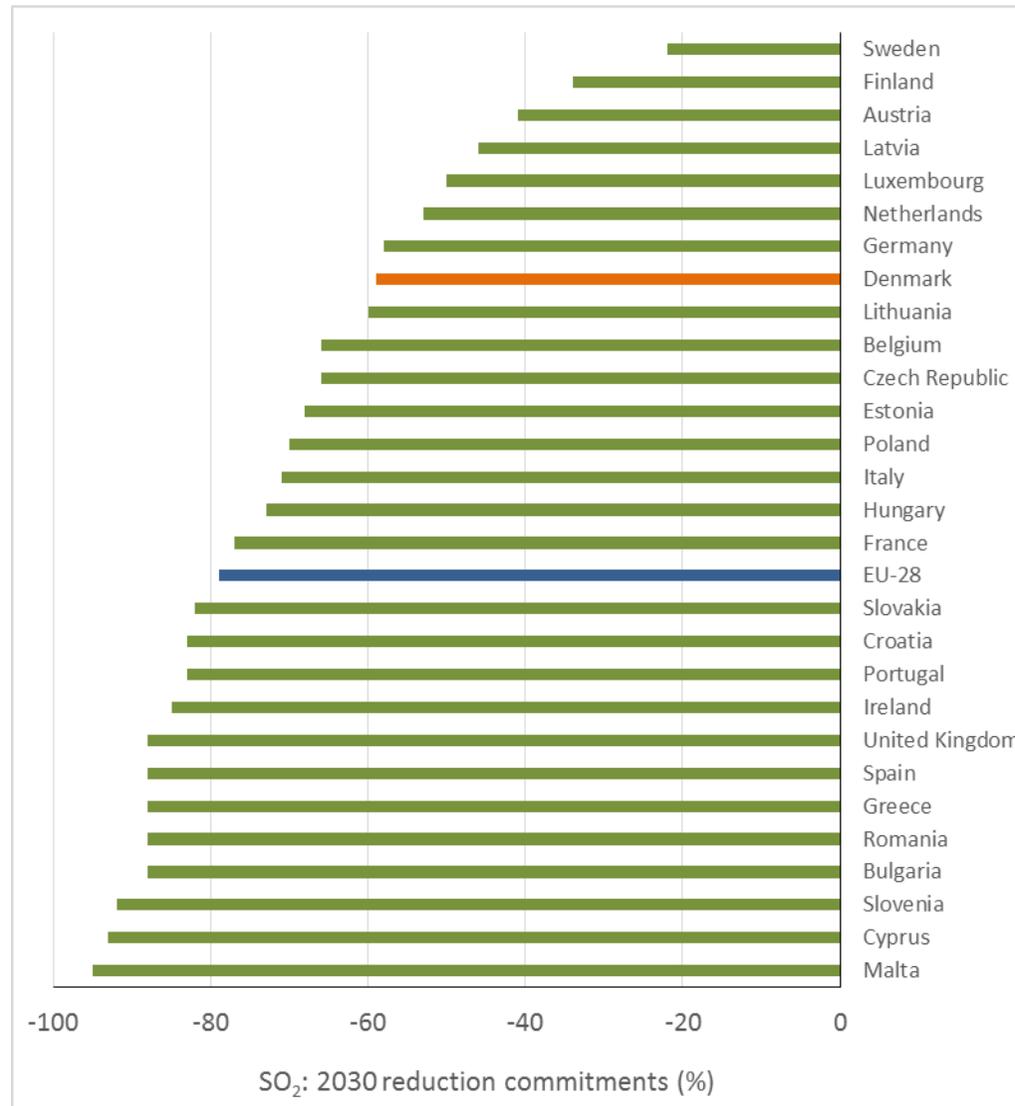
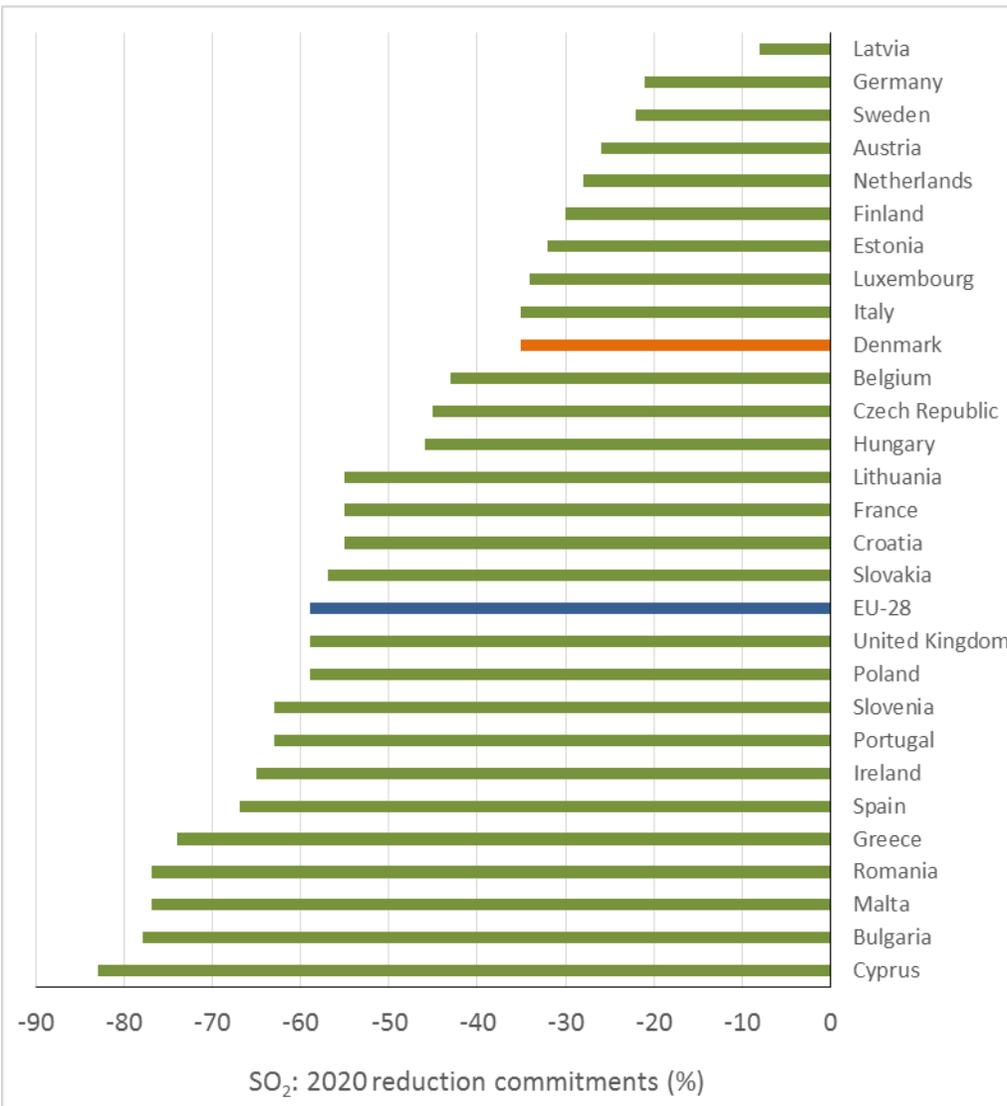


# EU-28: NECD future emission reduction commitments - NO<sub>x</sub>



% reductions compared to a 2005 baseyear

# EU-28: NECD future emission reduction commitments – SO<sub>2</sub>



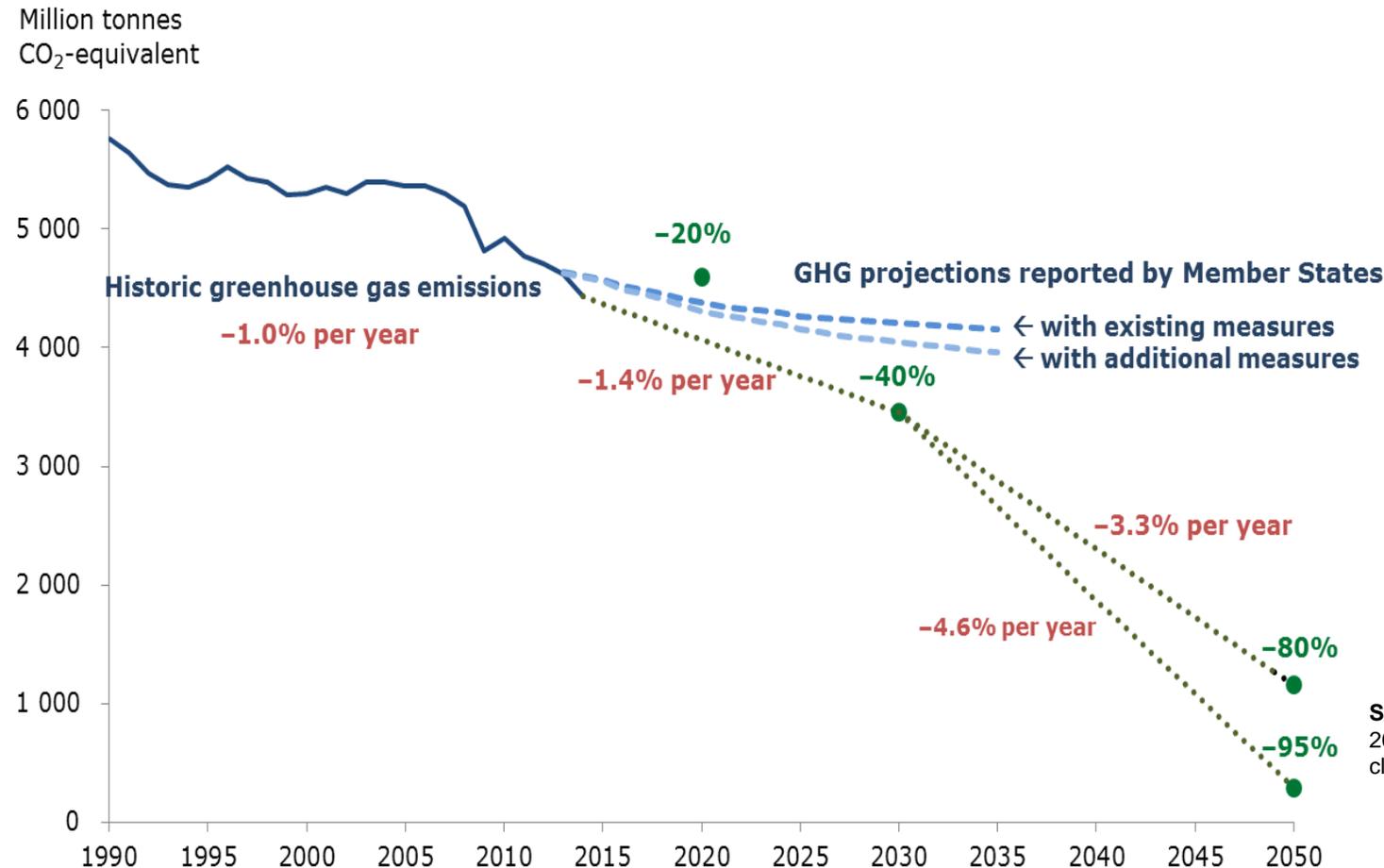
% reductions compared to a 2005 baseyear

# Future outlooks – synergies between climate change and air quality

## – the need for transitions.

Long-term challenges remain to reach the EU's longer-term environmental goals.

There can be important synergies between air pollution and GHG reduction actions – e.g. energy efficiency improvements give a 'win-win' outcome.



Source: EEA, Trends and projections in Europe 2015 — Tracking progress towards Europe's climate and energy targets





**Thank you**

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