

Estimating the costs of air pollution from industrial emissions data

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Juan Calero / TFEIP 2023 meeting / 20 April 2023

European Environment Agency
European Topic Centre
Human health and the environment



European Environment Agency

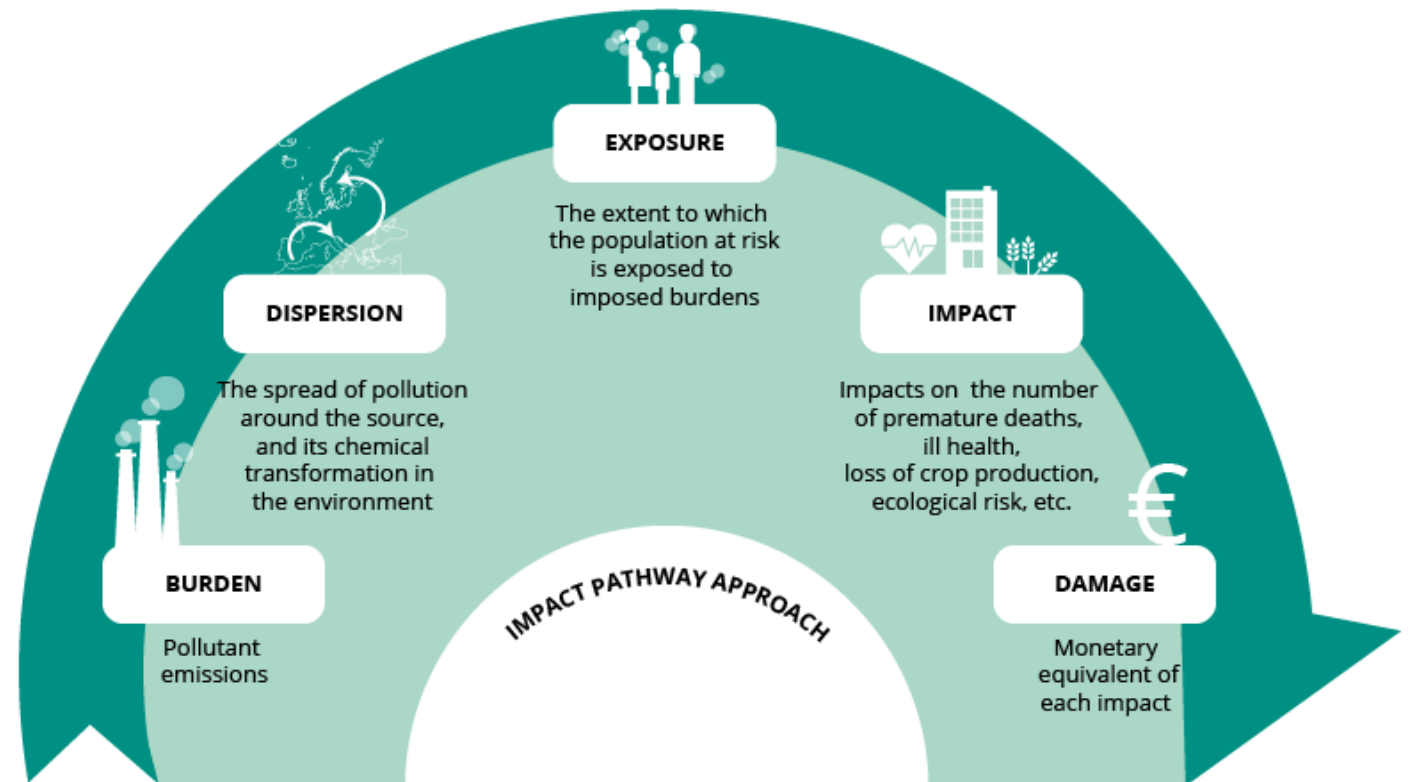


Content

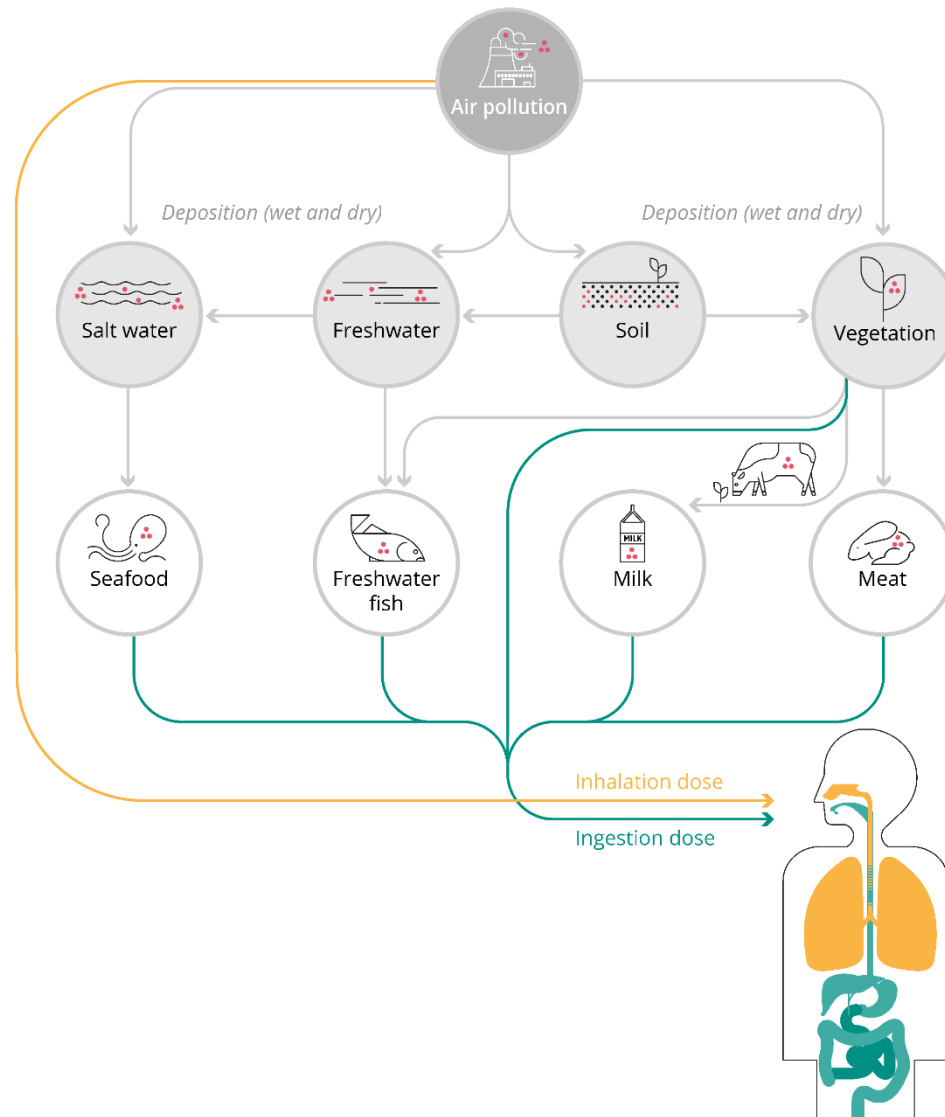
- Quick summary of methodology
- Impacts included
- Updates and innovations in current version
- Links to previous work

Methodology - Overview

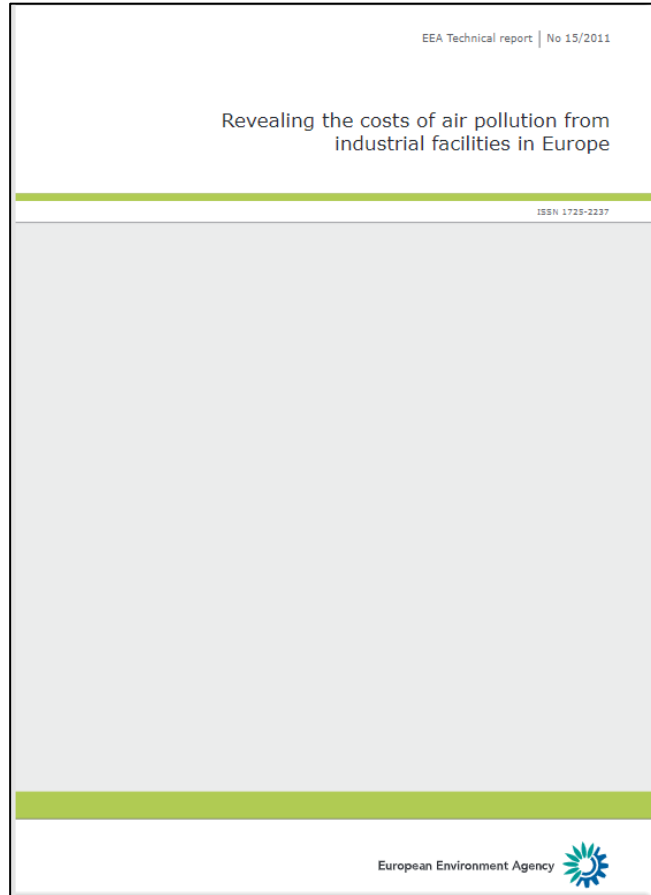
- Developed in the 1990s with subsequent peer reviews and updates over the years
- New EEA publication planned for 2023
- Support and expertise from ETC-HE



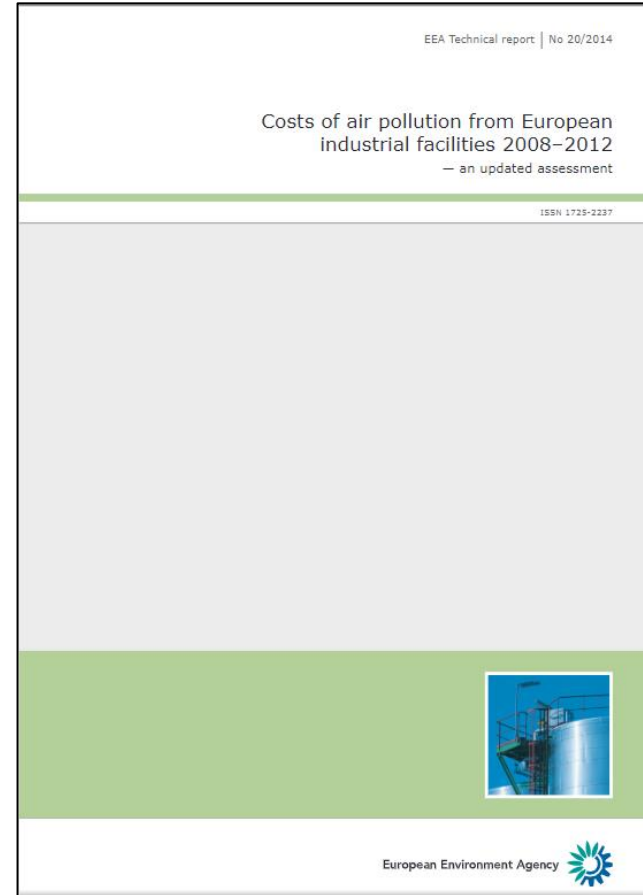
Methodology - Overview



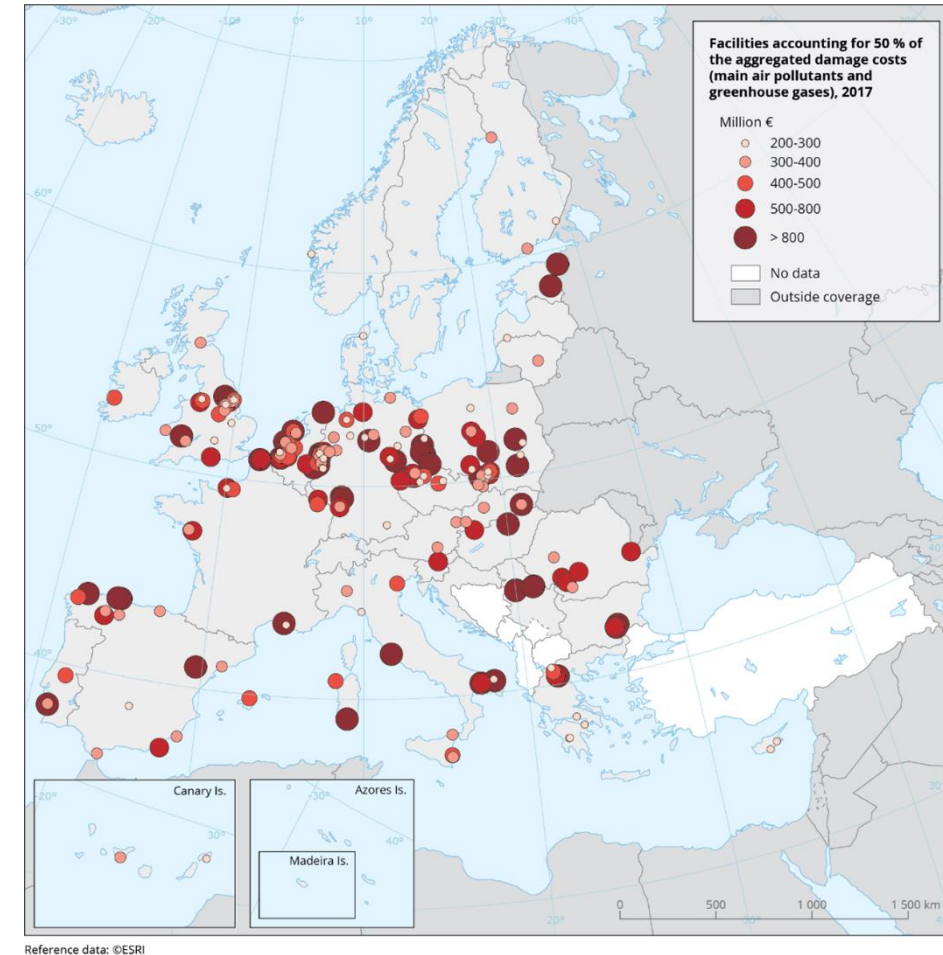
Previous EEA work on the topic



[EEA report: Revealing the costs of air pollution from industrial facilities in Europe \(2011\)](#)



[EEA report: Costs of air pollution from European industrial facilities 2008-2012 \(2014\)](#)



[EEA briefing: Counting the costs of industrial pollution \(2021\)](#)

Methodology - Scope

- Damage costs per tonne calculated for 39 European countries:
 - Main air quality pollutants (PM_{2.5}, PM₁₀, SO₂, NH₃, NO_x, NMVOC)
 - Heavy metals (As, Cd, Cr(VI), Pb, Hg, Ni)
 - Organic pollutants (1,3 butadiene, benzene, formaldehyde, PAH, dioxins and furans)
 - GHG (CO₂, CH₄, N₂O)
- Impacts:
 - Health
 - Crops and forests
 - Material damage to buildings
 - Ecosystems
- E-PRTR emissions (2012-2021)

Quantification of impacts

- Health impacts: Mortality and morbidity
- GHG: Climate change avoidance costs
- O₃: Yield loss (120 crops), biomass loss in forests
- NO_x and SO₂: Buildings
- NO_x and NH₃: Impacts on ecosystems from eutrophication

Updated modelling and data

- Additional health endpoints: Morbidity and additional health impacts from NOx exposure included in the 3rd Clean Air Outlook
- Use of 2019 source receptor matrices (SRMs)
- Updated social discount factor (3%) and prices (2021)
- Updated statistics (Population, health data, crop production data, forestry GVA and others)
- Updated and new sectoral exposure adjustment factors

Innovations compared to previous studies

- Additional sectoral adjustment considering $PM_{2.5}$ fraction in PM_{10}
- Marginal damage costs for health calculations are year-dependent
- Calculation of externalities will cover up to the latest year available on E-PRTR (2021)

Additional sectoral adjustment considering $PM_{2.5}$ fraction in PM_{10}

- Health impacts are calculated for $PM_{2.5}$
- PM_{10} emissions are reported to E-PRTR and SRM are produced for this pollutant
- Adjustment factors are made per country per GNFR code

Year-variety in marginal damage costs

- Previous methodology: One set of SRM and damage cost per country per pollutant (reference year approach)
- The new approach calculates changes in health damage for the population and mortality data specific to each year for which externalities are calculated (2012 to 2021).
- Mortality during the pandemic has an impact on damage cost per tonne calculated for the years 2020 and 2021.



- Externalities are currently being calculated by the ETC-HE
- The assessment will include up to the latest year available in E-PRTR including data from Member States that had been delayed in reporting (e.g. Germany)

Previous update:

Link to the EEA's briefing (2021): <https://www.eea.europa.eu/publications/counting-the-costs-of-industrial-pollution/counting-the-costs-of-industrial-pollution>

Underlying ETC report (2020): <https://www.eionet.europa.eu/etcs/etc-atni/products/etc-atni-reports/etc-atni-report-04-2020-costs-of-air-pollution-from-european-industrial-facilities-200820132017>

Industrial emissions data (E-PRTR):

Industrial emissions portal: <https://industry.eea.europa.eu/>

Thank you

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