

European briefings

Industry



The environmental performance of European industry has improved in recent decades. However, the sector is still responsible for significant amounts of pollution to air, water and soil, as well as generation of waste.

While legislation has delivered concrete achievements in reducing pollution, a transition to a greener European industrial sector will require integrated approaches, with stronger control of pollution at source, incentives to change operating practices and use of innovative technologies.

Context

Industry is a key component of Europe's economy, but it is also a source of pollution. For many years, environmental regulation has limited the adverse impacts of this pollution on human health and the environment. The EU policies currently used to limit industrial pollution include the following:

- The **Industrial Emissions Directive** (IED)^[1] defines the obligations for some 50 000 large industrial installations to avoid or minimise polluting emissions to the **atmosphere**, water, and soil. The IED also requires these installations to reduce waste.
- The **European Union's Emissions Trading System** (EU ETS)^[2] reduces greenhouse gas (GHG) emissions from more than 12 000 power generation and manufacturing installations in 31 countries^[3] as well as from aviation. The ETS covers around 45% of the EU's greenhouse gas emissions.
- The **Water Framework Directive**^[4] requires Member States to progressively reduce water pollution from a family of pollutants defined as 'priority substances'. It also requires Member States to cease or phase out emissions, discharges, and losses of a more dangerous family of pollutants defined as 'priority hazardous substances'.
- The **Urban Waste Water Treatment Directive**^[5] protects the environment from the harmful effects of discharges from urban wastewater and certain other industrial sectors.

Public access to information on industrial pollution has significantly improved in recent decades. In particular, the European Pollutant Release and Transfer Register (E-PRTR)^[6] provides a comprehensive register of pollution released by more than 30 000 individual facilities across 33 European countries.

Key trends

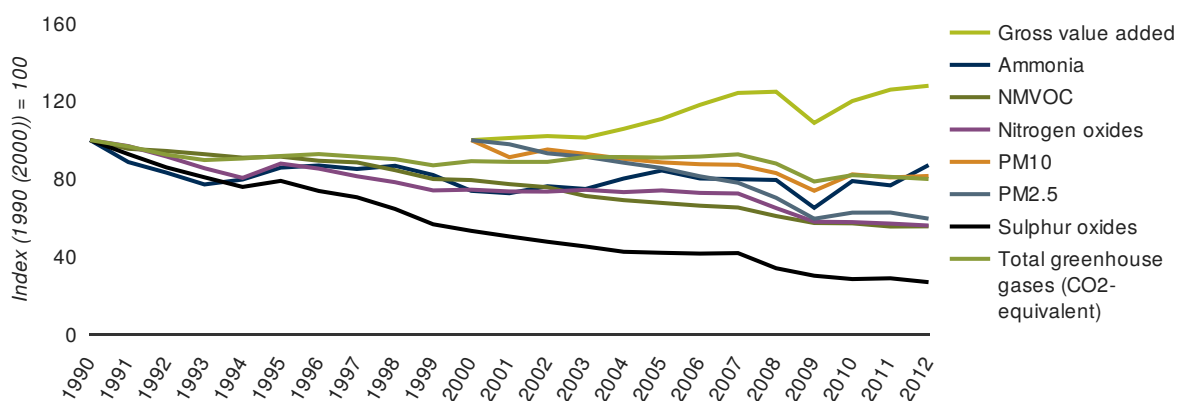
The environmental performance of European industry has improved in recent decades. However, the sector still remains a major source of environmental pollution.

Emissions of greenhouse gases and air pollutants

Industry contributes significantly to the emissions of many important air pollutants and greenhouse gases. In 2012, industry accounted for around 85% of sulphur dioxide emissions (SO₂), 40% of nitrogen oxide (NO_x), 20% of fine particulate matter (PM_{2.5}) and of non-methane volatile organic compound (NMVOC) emissions, and 50% of total greenhouse gas emissions in the EEA-33 countries.^{[8][9]} Emissions of these pollutants by industry have decreased since 1990 (Figure 1), while the productive capacity of the industry sector — in terms of gross value added (GVA)

— has increased. However, emissions from industry are not fully decoupled from economic activity: for most pollutants, there was a significant decrease in emissions in 2009 corresponding to the global economic downturn that year.

Figure 1: Emissions of air pollutants and greenhouse gases, and gross value added (GVA) from European industry (EEA-33)



Note: Emissions included are from the energy production and distribution, energy use by industry, and industrial processes sectors. NMVOC: Non-methane volatile organic compounds; PM₁₀: particulate matter with a diameter of 10 µm or less; PM_{2.5}: particulate matter with a diameter of 2.5 µm or less.

Data sources: a. Eurostat. [National Accounts by 10 branches - aggregates at current prices](#)

b. EEA. [National emissions reported to the UNFCCC and to the EU Greenhouse Gas Monitoring Mechanism](#)

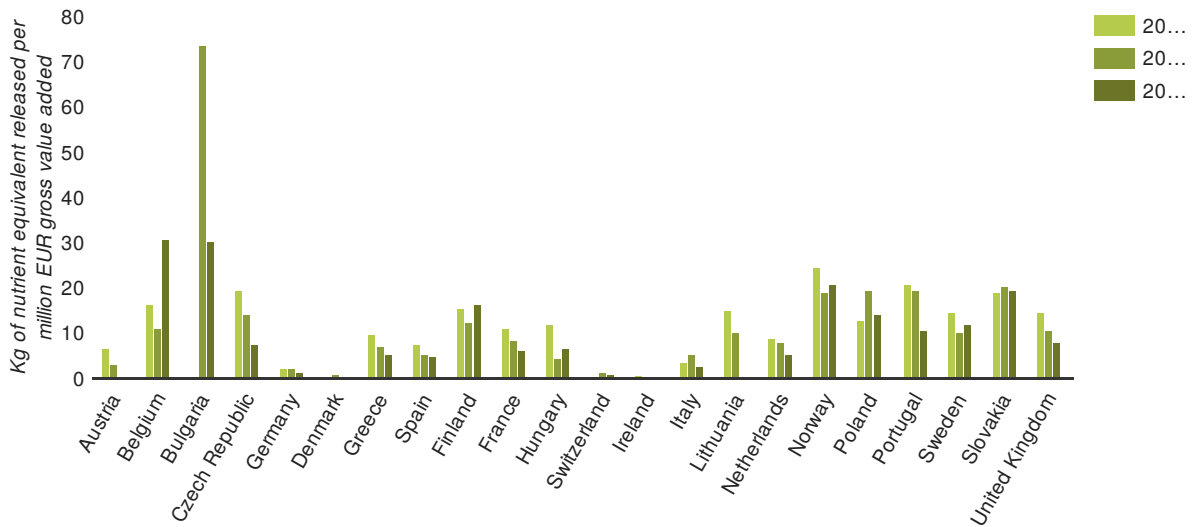
Emission reductions were driven by stricter environmental regulation, improvements in energy efficiency and pollutant abatement technologies, and a general tendency for European industry to move away from certain heavy and more polluting types of manufacturing. An example of improvements in pollutant abatement technology can be seen in the case of large combustion plants (LCPs). Emissions of SO₂, NO_x and dust per unit of energy input in large combustion plants under the EU LCP Directive^[10] have reduced significantly, falling by 49% for SO_x, 25% for NO_x, and 54% for dust over the period 2004 to 2009.^[11]

Between 2008 and 2012, the cost of damage to health and the environment from air pollution from the 14 000 most-polluting facilities in Europe was estimated at between EUR 329 billion and EUR 1 053 billion. A small number of facilities caused the majority of these damage costs: 50% of the costs occurred as a result of emissions from just 147 facilities (1% of these facilities).^[12] Such air pollution-related damage costs do not include costs for all impacts caused by industrial pollutants. Small facilities can also be the source of significant adverse impacts at the local scale.

Releases to water

Industry, including manufacturing plants and wastewater treatment plants, is responsible for large pollutant loads discharged to water. Over the last 30 years, the amount of pollutants released from such sources to water has progressively decreased. However, pollution caused by inadequately treated wastewater is still an important source of pollution in some areas. Emissions to water include heavy metals, organic pollutants, suspended solids, and organic matter, all of which can harm the ecological and chemical status of water bodies. Figure 2 shows the varying 'emissions intensity' of nutrients released to water from manufacturing industries between 2004 and 2010.

Figure 2: Nutrient releases to water — emissions intensity of manufacturing industries



Note: Emissions intensity of nitrogen and phosphorus nutrients (NACE, division 10-33). Data from food industry is not included for Norway due to discrepancy between coverage for economic data (GVA) and emissions data for facilities where main activity is intensive aquaculture.

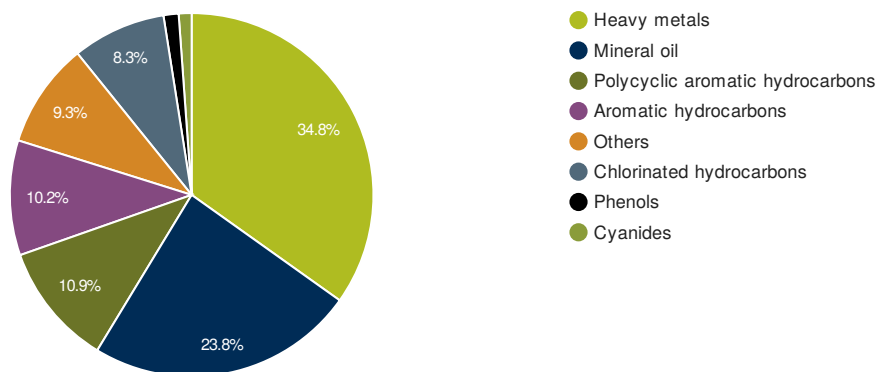
Data sources:

- a. DG ENV. The European Pollutant Release and Transfer Register (E-PRTR), Member States reporting under Article 7 of Regulation (EC) No 166/2006
- b. Eurostat. National Accounts by 31 branches - aggregates at current prices
- c. EEA – Indicator WREI003

Soil contamination from industry

Industry is a major contributor to soil contamination. There are an estimated 2.5 million contaminated sites across the 39 EEA member and cooperating countries. The manufacturing sector is responsible for around 60% of the contaminated sites.^[13] Figure 3 shows the main contaminants affecting soil in and around contaminated sites across Europe.

Figure 3: Contaminants affecting the solid matrix (soil, sludge, sediment) (2011)



Data sources: a. JRC. Eionet NRC Soil data collection on contaminated sites b. EEA – Indicator LSI003

Waste

The industrial sector in very broad terms (i.e. non-household sources) is responsible for about 90% of the 2.5 billion tonnes of waste generated (including mineral waste) every year in the EU. The most important sectors in terms of generation of industrial waste are: construction (34%), mining and quarrying (27%) and manufacturing (11%).^[14]

Prospects

A future transition to a greener European industrial sector requires an integrated approach, which strengthens control of pollution at source, and provides incentives to change operating practices and to implement new innovative technologies.

Policymakers consider it a priority to improve Europe's knowledge base on industrial pollution. Consistent with the Aarhus Convention,^[15] the 7th Environment Action Programme^[16] includes an objective of making information better available on the implementation of pollution control legislation. The IED requires that Member States provide improved consolidated information on industrial installations.^[17]

In the short term, strengthened legislation will help to better control emissions from industry. The IED will deliver more stringent controls on how industry can operate than the former Industrial Pollution Prevention and Control (IPPC) Directive. These controls will be based on the Best Available Technique (BAT) principle, and cover a broader range of industrial activities than the IPPC Directive. The IED has also identified as a priority the need to address previously unregulated sources of emissions. An example are medium-sized combustion plants (MCPs), which the European Commission's recently proposed Clean Air Policy Package for Europe^[18] has now proposed to regulate.^[19] The proposed MCP Directive should deliver significant annual emission reductions of the key air pollutants SO₂, NO_x and PM.^[20]

There is also significant potential to reduce emissions of air pollutants from large combustion plants (LCPs). 2015 NO_x emissions could, for example, be 36% lower than in 2009 if all plants were to meet the new IED emission limit values, and could be 69% lower if LCPs were to achieve the more stringent BAT-associated emission levels.^[21] SO₂ and dust emissions could also be significantly reduced if all LCPs met the new IED emission limit values.

For GHG emissions, the EU ETS was designed as a key tool to drive the introduction of low-carbon technology in the industrial sector (see SOER 2015 briefing on climate change mitigation). During the third phase of the EU ETS (2013–2020), the EU-wide cap will decrease to ensure that by 2020 GHG emissions from facilities covered by the scheme will be 21% lower than in 2005. Additional reforms to the EU ETS to drive further emission reductions beyond 2020 (phase 4) have also been presented.^[22] These reforms would further decrease emissions of GHGs from installations to around 43% below 1990 levels by 2030.

In the longer term, the Commission's Roadmap to a Resource Efficient Europe^[23] outlines how Europe's economy might become sustainable by 2050. It proposes ways to increase resource productivity and decouple growth from resource use, while avoiding 'lock-in' to any particular technology, providing a pathway to cut GHG emissions to 80% below 1990 levels by 2050.

SOER 2015 European briefings present the state, recent trends and prospects in 25 key environmental themes. They are part of the EEA's report SOER 2015, addressing the state of, trends in and prospects for the environment in Europe. The EEA's task is to provide timely, targeted, relevant and reliable information on Europe's environment.

For **references**, see www.eea.europa.eu/soer or scan the QR code.

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