



# UK National Atmospheric Emissions Inventory

For more than 20 years, Ricardo has developed and maintained the UK National Atmospheric Emissions Inventory (NAEI) on behalf of the Department for Business, Energy and Industrial Strategy (BEIS), the Department for Environment, Food and Rural Affairs (Defra), the Scottish Government, the Welsh Government and the Department of Environment, Northern Ireland.

The NAEI provides insight into the current levels and trends in emissions of different air quality pollutants and greenhouse gases (GHGs) from different sources to support the assessment of impacts on the environment and human health. It also enables the UK Government to:

- Meet its reporting obligations under the Convention on Long-Range Transboundary Air Pollution, the Kyoto Protocol, the Gothenburg Protocol and the Montreal Protocol.
- Generate and develop the evidence base to support environmental research and policy development in the UK and EU.

All of the NAEI information and reports can be freely accessed at the NAEI's website ([naei.beis.gov.uk](http://naei.beis.gov.uk)) and are distributed under an Open Government Licence.

# About the NAEI

The NAEI is a state-of-the-art emissions database. It provides historical and projected emission estimates of a range of air quality pollutants and GHGs from all man-made emission sources in the UK, from 1970 to the present day, across a wide range of sectors including energy, industry, transport, waste, land-use change and agriculture.

Ricardo's team of more than 30 scientists and emissions experts conducts an annual programme of research to identify and use the best available data to generate the

UK-wide estimates. We draw on a wealth of different datasets, including from industrial installations, national statistics on production and consumption of materials and fuels, and information on land-use characteristics.

We also carry out bespoke research to characterise the emissions from other sources such as transport, waste management and livestock. The Ricardo NAEI team uses methods and estimation models that are consistent with international inventory reporting guidelines.

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## Characteristics

For each pollutant, the NAEI provides a complete picture of emissions from sources. This enables tracking of trends over time to provide insight into economic and policy impacts in the UK as environmental regulation and reporting has developed to address GHG emissions, transboundary air pollution (acidification, eutrophication, ground-level ozone and fine particulate matter (PM)) and local air quality, and their effects on health. The NAEI includes emissions estimates of the following groups of pollutants:

- GHGs – carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), nitrous oxide (N<sub>2</sub>O) and fluorinated hydrocarbons (the so-called 'F-gases').
- Acidification and eutrophication pollutants and precursors to transboundary air pollution – sulfur dioxide (SO<sub>2</sub>), nitrogen oxides (NO<sub>x</sub>), ammonia (NH<sub>3</sub>), non-methane volatile organic compounds (NMVOC) and carbon monoxide (CO).

- Priority local air quality pollutants – PM (PM<sub>10</sub>, PM<sub>2.5</sub> and PM<sub>0.1</sub>), benzene, 1-3 butadiene and black carbon.
- Other pollutants of concern for environmental impacts – heavy metals (such as arsenic, cadmium, chromium, nickel and lead), persistent organic pollutants (POPs) (such as polychlorinated biphenyls (PCBs), dioxins and furans) and base cations (sodium (Na), potassium (K), calcium (Ca<sup>2+</sup>) and magnesium (Mg<sup>2+</sup>)).

The NAEI database covers emissions from the UK mainland, and all UK Crown Dependencies and Overseas Territories including Gibraltar, Bermuda and the Falkland Islands.

# Data and tools

NAEI emissions data can be presented at the national, regional or local level, supporting decision-making within the devolved administrations, cities and local authorities. On the NAEI website, emission data can be visualised as temporal trends, covering the period between 1970 to Year-2<sup>1</sup> for air pollutants and 1990 to Year-2 for GHGs.

For all emission sources, the underlying emission factors and activity data used to compute emissions can also be obtained from the website. Emission data can be downloaded as csv files and viewed as pivot tables. They are also presented in the form of UK maps, which are produced annually on a 1kmx1 km resolution grid relying on an advanced geographic information system (GIS) infrastructure.

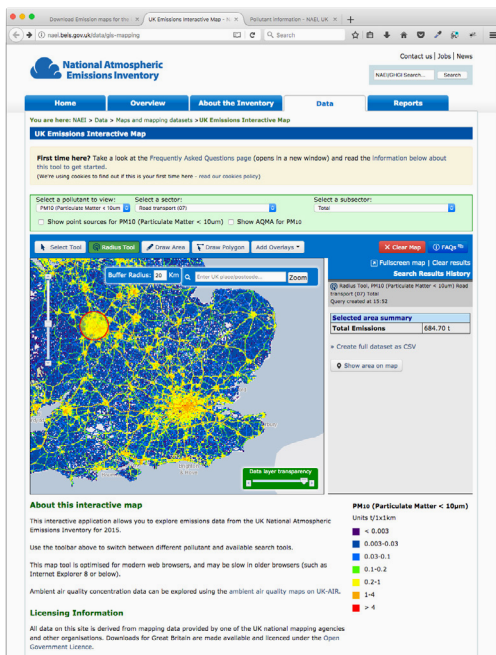
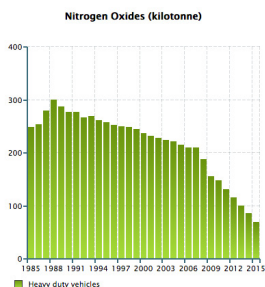
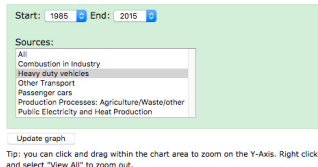
## Typical outputs available to users from the NAEI

have declined by 59% mainly as a result of emission reductions observed from power stations and the road transport sector. Emissions from road transport fell due to the introduction of catalytic converters and stricter regulations (i.e. Euro Standards), and power sector emissions have declined due to changes in fuels burnt (more gas and less coal), and the use of control technologies to minimise emissions. The UK is currently on track to meet the Gothenburg Protocol target in 2020, but emissions will need to be reduced by a further 21% from 2015 to meet this target.

» View and Download Nitrogen Oxides emission summary data

» View Nitrogen Oxides mapping data

### Time series graph



<sup>1</sup> Year-2 is the current year minus 2. For 2017, the latest inventory available to the public is the 2015 inventory.

## Chart and maps

The NAEI website hosts interactive mapping tools that allow users to explore the emissions data of the air pollutant inventory and conduct queries for specific areas as well as the CO<sub>2</sub> totals by local authority. Data are presented in user-friendly ways and can be downloaded in formats that are readily compatible with typical desktop applications. It is done this way so that researchers can apply NAEI data within air quality modelling and health impact studies at national, regional, local or city level, or to target research for specific sources or economic sectors.

International reporting submissions are delivered annually in very specific reporting formats defined by international guidance, which ensures that all countries generate data in a comparable format.

## People and capabilities

- World-renowned road transport modellers.
- Sector experts in waste, aviation, road transport, shipping, agriculture and industry.
- Qualified UNFCCC reviewers.
- GIS and mapping experts.
- Policy advice and scenario analysis.
- Projections of air quality pollutant emissions.
- Compliance reporting.
- Uncertainty analysis.
- Capacity building and support.
- Automated and bespoke QA/QC.
- Corporate reporting.
- Carbon footprinting.
- Local and city inventories.
- Websites and data visualisation.

## NAEI Interactive mapping tools

