

Benchmarking Emissions for the Netherlands

Developed by **TNO**, **RIVM** and **KNMI** using CAMS data



1 The challenge

Addressing urgent health and climate challenges requires a clear understanding of where emissions originate, how they affect air quality, and whether interventions lead to measurable outcomes.

No single dataset provides a complete picture as different emission datasets each have different methodologies and assumptions, making it difficult for users to assess their accuracy and reliability.

A consistent framework is therefore needed to systematically evaluate and validate emission datasets, in order to identify their respective strengths, limitations and complementarity.

> **The case lead** The Netherlands Organisation for Applied Scientific Research (TNO)



> **The solution** CAMS supports a three-way comparison between the Dutch Pollution Release and Transfer Register, CAMS-REG, as well as top-down estimates based on satellite observations to improve the knowledge base and quality of each of the three products.

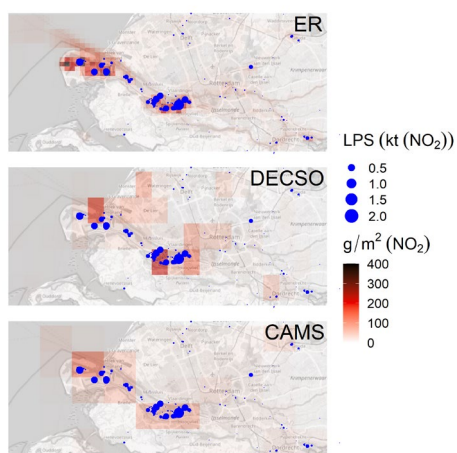
UN SDGs tackled



2 How can CAMS help?

Using the CAMS regional inventory (CAMS-REG), a comparison can be performed with satellite-derived emissions (DECSO) and national high-resolution bottom-up inventories, such as the Dutch Pollutant Release and Transfer Register (ER). Bottom-up inventories use different assumptions and are independent from top-down satellite-based emission estimates.

The approach developed for the Netherlands can be replicated elsewhere; even up to the global scales in addition to providing a cross-border perspective on emission estimates.



Credits: NO₂ emission maps for the Rotterdam-Rijnmond region (2023) comparing ER, DECSO, and CAMS inventories. Area emissions are shown in g/m² (red), with ER-derived Large Point Sources (LPS) overlaid in kt (blue circles).

> Key CAMS data products used

Product 1 > CAMS regional emission inventories

[Access CAMS-REG Data](#)

[Access Paper Kuenen et al., 2022](#)

> Complementary data and information

Product 2 > Dutch Pollution Release and Transfer Register (ER)

[Access ER Data](#)

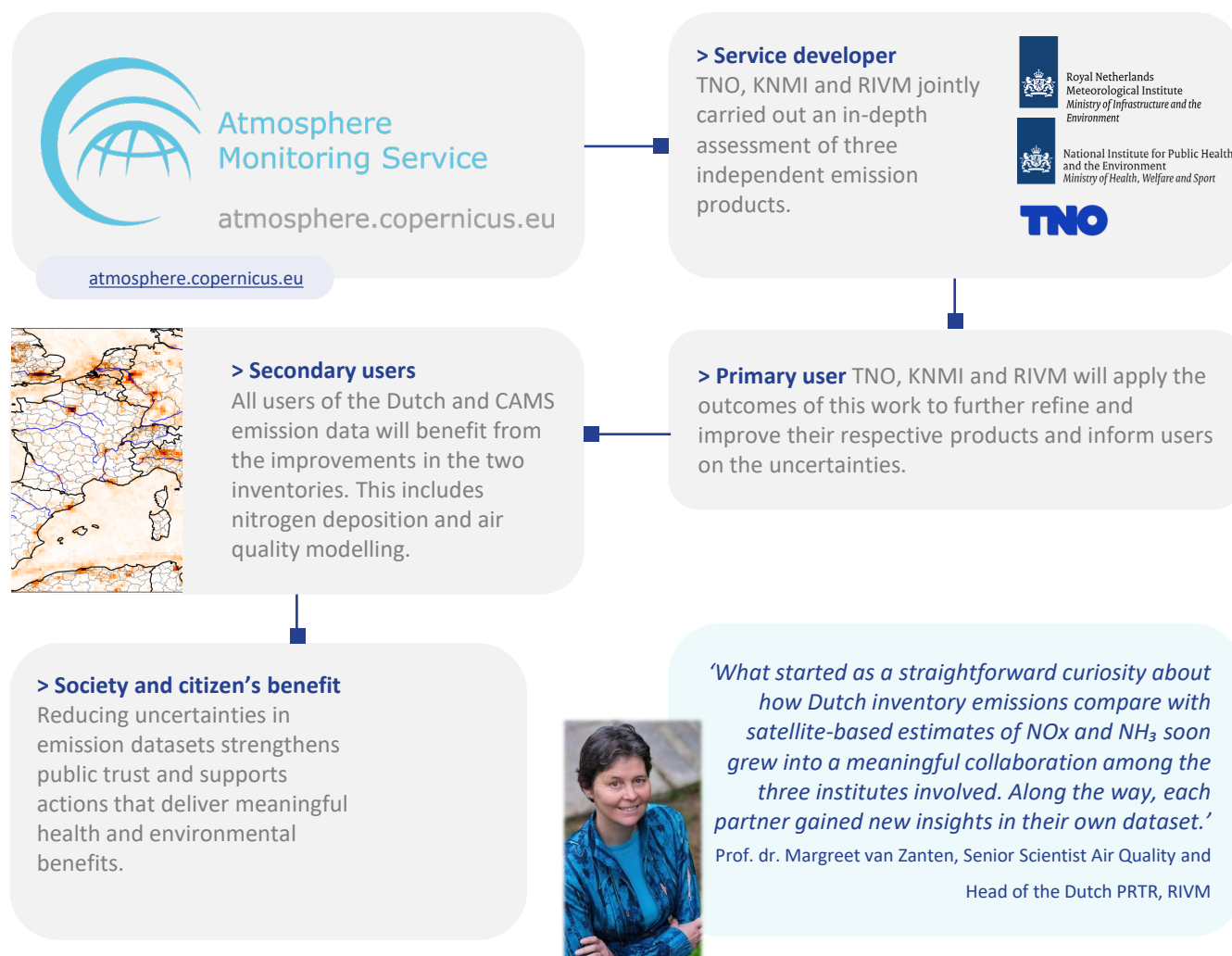
[Access Paper Witt et al., 2026](#)

Product 3 > DECSO satellite-derived emissions

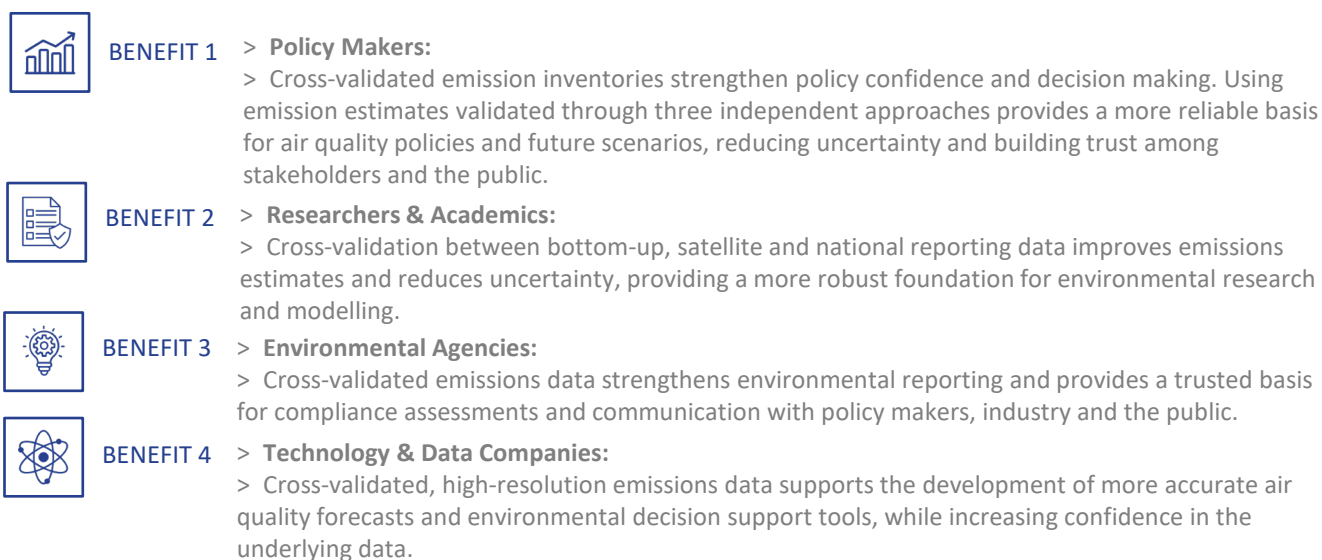
[Access Paper van der A et al., 2024](#)

[Explore the Atmosphere Data Store](#)

3 Who is involved?



4 Benefits along the value chain



Find out more

atmosphere.copernicus.eu

[Atmosphere Data Store](https://Atmosphere>Data/Store)

ecmwf.int