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## COPERT for European policy

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COPERT is closely linked to a number of modelling tools used to inform policymaking.

### GAINS

Data from COPERT are included in the GAINS integrated assessment model used by the UNECE LRTAP Convention and the European Commission to identify cost effective pollutant mitigation strategies that take into account synergies and trade-offs between the control of local and regional air pollution and the mitigation of greenhouse gas emissions.

### TREMOVE

The TREMOVE policy assessment model assesses the effects of different transport and environment policies on transport emissions. The COPERT II emission factors and methodology were implemented in the road transport module of the first TREMOVE version in 1999, updated to COPERT III in 2004 and again to COPERT 4 in 2006.

### TERM

The integration of EU transport and environment policies is monitored by the Transport and Environment Reporting Mechanism (TERM). COPERT 4 is used to calculate various TERM indicators for road transport.

### Other applications

COPERT, through its links to TREMOVE, has been used in impact assessment studies of the European Commission to evaluate the impact of proposed technological and legislative measures to road transport. Examples include measures to reduce CO<sub>2</sub> emissions from passenger cars, the introduction of EURO VI standards for heavy duty vehicles, effects of the internalisation of external costs, and others.

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## COPERT website

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For **free download** of the software, visit:

[www.emisia.com/copert](http://www.emisia.com/copert)

Quick start instructions and a detailed user's manual are available.

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## Support

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COPERT 4 software development is supported by:

The European Environment Agency — [www.eea.europa.eu](http://www.eea.europa.eu).

The Institute for Energy and Transport of the European Commission Joint Research Centre funds the technical development of COPERT — [iet.jrc.ec.europa.eu](http://iet.jrc.ec.europa.eu).

COPERT 4 software and methodology development is performed by EMISIA S.A. — [www.emisia.com](http://www.emisia.com).



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# COPERT 4

## Estimating emissions from road transport



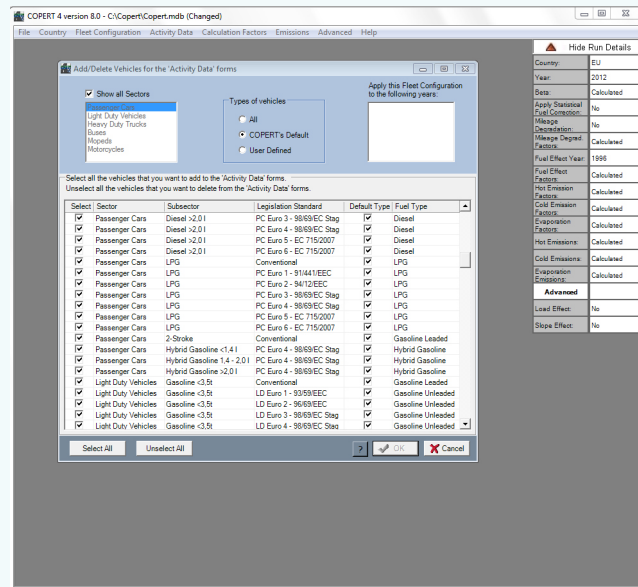
European Environment Agency



## Introduction

**COPERT 4 (Computer Programme to calculate Emissions from Road Transport)** is a Microsoft Windows® application to calculate emissions from the road-transport sector.

- Internationally recognised — used by many European countries for reporting official emissions data.
- A research tool — calculate emissions at a national, regional or local scale, and for annual to daily estimates.
- Technologically advanced and transparent — COPERT's methodology is published and peer-reviewed by experts of the UNECE LRTAP Convention.
- Includes all main pollutants: greenhouse gases, air pollutants and toxic species.



## Users

Each year, there are around 1 000 downloads of COPERT 4.

The COPERT 4 software is used in a variety of applications including:

- by countries, to report official emissions data to UNFCCC, the UNECE LRTAP Convention and to the European Union;
- scenario studies to support policy decisions;
- input for air quality modelling studies;
- calculating local transport emissions;
- research, scientific and academic use.

## Technical features

### Emission types

Unlike some other models, COPERT estimates emissions from all relevant road vehicle modes:

- thermal stabilised engine operation ('hot' emissions);
- the warming-up phase ('cold start' emissions);
- non-exhaust emissions (from fuel evaporation, tyre and brake wear emissions).

### Detailed vehicle categories

COPERT 4 contains emission factors for more than 240 individual vehicle types including for:

- passenger cars;
- light duty vehicles;
- heavy duty vehicles (including busses);
- mopeds, and motorcycles.

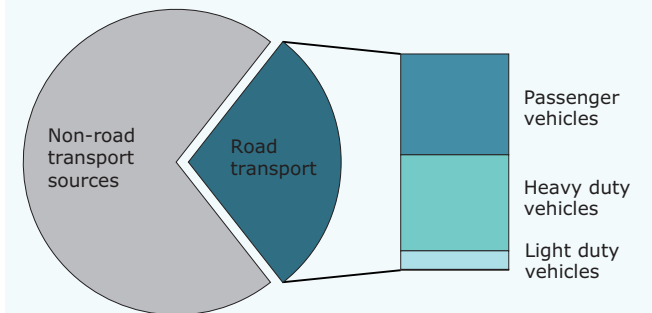
Emission control technologies (e.g. 'Euro' standards) are included for the vehicle categories — additional user-defined technologies can be easily included.

## Methods

Based on the latest science, different methods are used to estimate emissions of the various pollutants.

Method	Pollutants
Emission factors	CO, NO <sub>x</sub> , NMVOC, CH <sub>4</sub> , N <sub>2</sub> O, NH <sub>3</sub> , PM incl. PM <sub>2.5</sub> , PM <sub>10</sub> , EC etc., PM number and surface area
Fuel consumption based	CO <sub>2</sub> , SO <sub>2</sub> , Pb, Cd, Cr, Cu, Ni, Se, Zn
Percentage of total VOC	PAHs, POPs, dioxins, furans, alkanes, alkenes, alkynes, aldehydes, ketones, cycloalkanes, aromatics

## Europe's road transport NO<sub>x</sub> emissions



## Software integration

COPERT 4 provides interfaces to a number of other software applications. Data can be imported directly from MS Excel, and older COPERT versions.

For countries, COPERT data may be exported directly in xml for easy integration into UNFCCC CRF Reporter. It can also be exported in formats compatible with the requirements of reporting to the UNECE LRTAP Convention.