COPERT webinar

3. Activity Data

emisia
CONSCIOUS OF TRANSPORT'S IMPACT

European Environment Agency
European Topic Centre on Air pollution, transport, noise and industrial pollution

Vehicle categories and subcategories

Main vehicle categories (top level)

Passenger cars (M1)	
Light commercial vehicles (N1)	
Heavy duty trucks (N2, N3) Buses (M2, M3)	
Mopeds (L1, L2) Motorcycles (L3, L4, L5) Micro-cars (L6) ATVs (L7)	

Also known as light duty vehicles

Also known as heavy duty vehicles

Also known as L-category vehicles

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Fuel and segment subcategories

- **Passenger cars**
  - **petrol/diesel** (mini, small, medium, large-SUV-executive)
  - **petrol/diesel hybrid** (mini*, small, medium, large-SUV-executive)
  - **petrol/diesel PHEV** (small*, medium*, large-SUV-executive)
  - **LPG/CNG bifuel** (mini, small, medium, large-SUV-executive)
  - **flexi-fuel** (small, medium, large-SUV-executive)
  - **BEV/FCEV** (small, medium, large-SUV-executive)
- **Light commercial vehicles**
  - **petrol/diesel** (N1-I, N1-II, N1-III)
  - **petrol/diesel hybrid** (N1-I, N1-II, N1-III)*
  - **petrol/diesel PHEV** (N1-I, N1-II, N1-III)
  - **LPG/CNG bifuel** (N1-I, N1-II, N1-III)
  - **flexi-fuel** (N1-I, N1-II, N1-III)
  - **BEV/FCEV** (N1-I, N1-II, N1-III)
- **Heavy duty trucks**
  - **petrol, diesel hybrid, diesel PHEV, LPG/CNG/LNG, BEV/FCEV**
  - **diesel** (14 GVW subcategories)
    - rigid: 3.5 - 7.5 t , 7.5 - 12 t , 12 - 14 t , 14 - 20 t , 20 - 26 t , 26 - 28 t , 28 - 32 t , >32 t
    - articulated: 14 - 20 t , 20 - 28 t , 28 - 34 t , 34 - 40 t , 40 - 50 t , 50 - 60 t
- **Buses**
  - **petrol, diesel hybrid, diesel PHEV, LPG/CNG, BEV/FCEV**
  - **diesel** (5 segment subcategories)
    - urban buses: midi <=15 t , standard 15 - 18 t , articulated >18 t
    - coaches: standard <=18 t , articulated >18 t
- **L-category vehicles**
  - mopeds (2/4-stroke <50 cm^3) **(petrol, BEV)**
  - motorcycles (2-stroke, <250 , 250 – 750 , >750 cm^3) **(petrol, BEV)**
  - micro-cars **(diesel, BEV)**
  - ATVs **(petrol)**

* Segment subcategories only for petrol hybrid or petrol PHEV

Vehicle technologies (Euro standards)

	Passenger cars	Light commercial vehicles	Heavy duty trucks & buses	L-category vehicles
Conventional	PRE ECE			
	ECE 15/00-01			
	ECE 15/02			
	ECE 15/03			
	ECE 15/04			
	Improved Conventional			
	Open Loop	Conventional	Conventional	Conventional
	Euro 1	Euro 1	Euro I	Euro 1
	Euro 2	Euro 2	Euro II	Euro 2
	Euro 3	Euro 3	Euro III	Euro 3
	Euro 4	Euro 4	Euro IV	Euro 4
	Euro 5	Euro 5	Euro V	Euro 5
	Euro 6 a/b/c (up to 2016)	Euro 6 a/b/c (up to 2016)	Euro VI A/B/C	
	Euro 6 d-temp (2017-2019)	Euro 6 d-temp (2017-2019)	Euro VI D/E	
	Euro 6 d (2020+)	Euro 6 d (2020+)		

Input data

Input data needed

1. Fleet

A. Passenger transport (passenger cars, buses, L-category vehicles)

B. Freight transport (light commercial vehicles, heavy duty trucks)

Split per fuel (energy) type, segment subcategories, and technologies/Euro standards

2. Mileage

Average annual distance driven [km/vehicle]

3. Speeds

Average travelling speeds in urban, rural, highway modes [km/h]

4. Activity shares

Share of activity in urban, rural, highway modes [%]

5. Temperatures

Country average [^{o}C]

6. Fuel (energy) consumption

Statistical fuel sold [TJ]

Importance and availability of input data

Parameter	Importance	Availability	Notes on statistical sources
Total number of vehicles	⇧⇧	☺	Reliable statistical data is available for all vehicle categories; the only exception is the micro-cars and ATVs, for which an estimation may be needed
Split of vehicle fleet per fuel (energy) type	⇧⇧	☺	Statistical data is available, small differences may exist between various sources
Disaggregation of vehicle fleet into segments (engine capacity classes / GVW)	⇧	😐	• No single source provides all data at the level of detail required • Uncertainties related to whether some vehicles belong to a certain segment subcategory or not, estimations and assumptions may be needed
Allocation of vehicle fleet to technology / Euro standards	⇧⇧	😐☹	• No centralized source exists at European level, information can be possibly found at national registers (if available) • If no statistical data exist, age distributions can be used to allocate vehicles to emission standards
Mileage (average annual distance driven)	⇧⇧	😐☹	Sparse statistical data can be possibly found at aggregated level, assumptions will be needed to differentiate per fuel (energy) type, segment, and age / Euro standard
Driving speeds and activity shares in different driving modes (U/R/H)	⇧	☹	Statistical data not available, reasonable estimates are sufficient
Temperatures	⇗	😐	Statistical data can be found on the Internet for major cities, estimations may be needed to produce country averages
Fuel (energy) consumption	⇧⇧	☺	Statistical data is available (fuel sold)

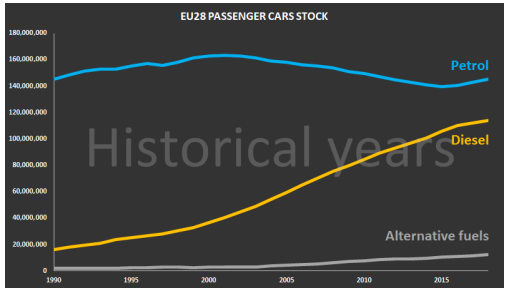
Wizard

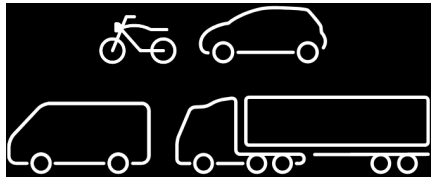
New Run Wizard
1 Add Year
2 Select Year
3 Environmental Information
4 Fuel Specifications
5 Lubricant Specifications
6 Statistical Fuel Consumption
7 Stock Configuration
8 Stock & Activity Data
9 Circulation Data
10 Fuel Balance
11 Calculate
12 Emissions
Back
Start
Close

Detailed ‘ready-to-use’ activity data for COPERT

Context and background

- EMISIA actively maintains **reliable** and **up-to-date** vehicle fleet and activity road transport data, ready to be used in air pollutant and GHG emission calculations with COPERT → https://www.emisia.com/utilities/copert-data/



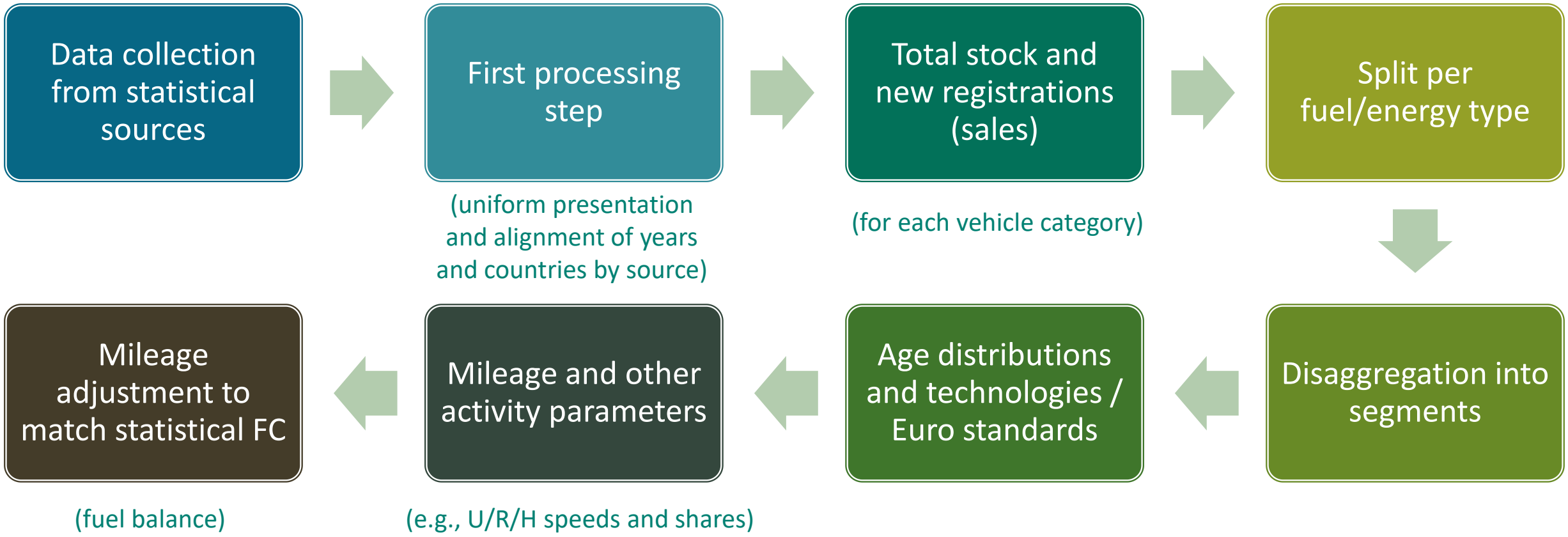


- **Annual updates** are performed considering all recent statistical data
- **Quality, completeness, and consistency** are ensured with:
  - Significant expertise on transport data, more than 20 years of experience
  - Extensive peer reviews from external independent reviewers and cross-checking

Related EC funded projects

- **<u>The FLEETS project:</u>** "European Database of Vehicle Stock for the Calculation and Forecast of Pollutant and Greenhouse Gases Emissions with TREMOVE and COPERT"
  - EC, DG Environment, Dec. 2006 – Apr. 2008
  - **EMISIA**, LAT/AUTH, E^3M-Lab/NTUA, Oekopol, Envicon, KTI, Renault
  - **Data cover the period 2000-2005**
- **<u>The TRACCS project:</u>** "Transport data collection supporting the quantitative analysis of measures relating to transport and climate change"
  - EC, DG Climate Action, Jan. 2012 – Dec. 2013
  - **EMISIA**, INFRAS, IVL
  - **Data cover the period 2005-2010**
- **<u>The NMP project:</u>** "New Mobility Patterns in European Cities"
  - EC, DG MOVE, Oct. 2019 – Jul. 2022
  - **EMISIA**, STRATEC, FIT, TRT, PANTEIA, IFSTTAR,GDCC
  - **Data cover the period 2005-2018**

Our approach in a nutshell – flowchart of dataset creation



- Harmonization with official national statistical data
- Main fleet structure and evolution trends reflected

Data sources and methodology

Main data sources

Source	Main information provided
Eurostat	Stock and new registrations per fuel and engine capacity / GVW
EC Statistical Pocket Book (EU Transport in figures)	Stock and new registrations
ACEA	Stock per fuel, new registrations per fuel and per segment / GVW
ACEM	Stock, new registrations per fuel and engine capacity (L-vehicles)
CO_2 monitoring database	New registrations per fuel and segment (PCs and LCVs)
EAFO (European Alternative Fuels Observatory)	Stock and new registrations of alternative fuels (LPG, CNG/LNG, electric, H_2)
NGVA Europe (Natural Gas Vehicle Association) NGV Global (Natural Gas Vehicle Knowledge Base)	Stock of natural gas vehicles
UNFCCC	Fuel sold, based on Eurostat and disaggregated per vehicle category
National statistical institutes	Various information (level of detail is country-dependent)

Data example xlsx file

Thank you for your attention