



United Nations  
Climate Change

# Webinar on the COPERT model to support National Greenhouse Gas Inventories from developing countries under the Enhanced Transparency Framework of the Paris Agreement

UNFCCC  
Transparency Division

14 – 16 October 2025

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# Day 1

**Tuesday 14 October 2025**

**15:00 – 17:00 (Bonn Time)**

# Session 1

## Opening Session

### Opening Remarks by UNFCCC Secretariat

- Objectives
- Expectations
- Reporting requirements (MPGs, Article 13 of Paris Accord)

UNFCCC Secretariat

# Session 2

## Overview of road transportation in developing countries and methodological issues for estimating GHG emissions from road transportation

By the end of this session, you will know more about :

1. Road transportation situation in developing countries (vehicle fleet, data collection and management, etc.)
2. Major challenges for developing countries to report GHG emissions from road transportation



**Learning objectives**

# Mentimeter

Developing countries interested in Copert model to estimate GHG emissions from road transportation with higher tiers in line with the 2006 IPCC Guidelines and MPGs (ETF)



<https://www.menti.com/a lese9pm9jan>

Mentimeter code: **8403 4429**



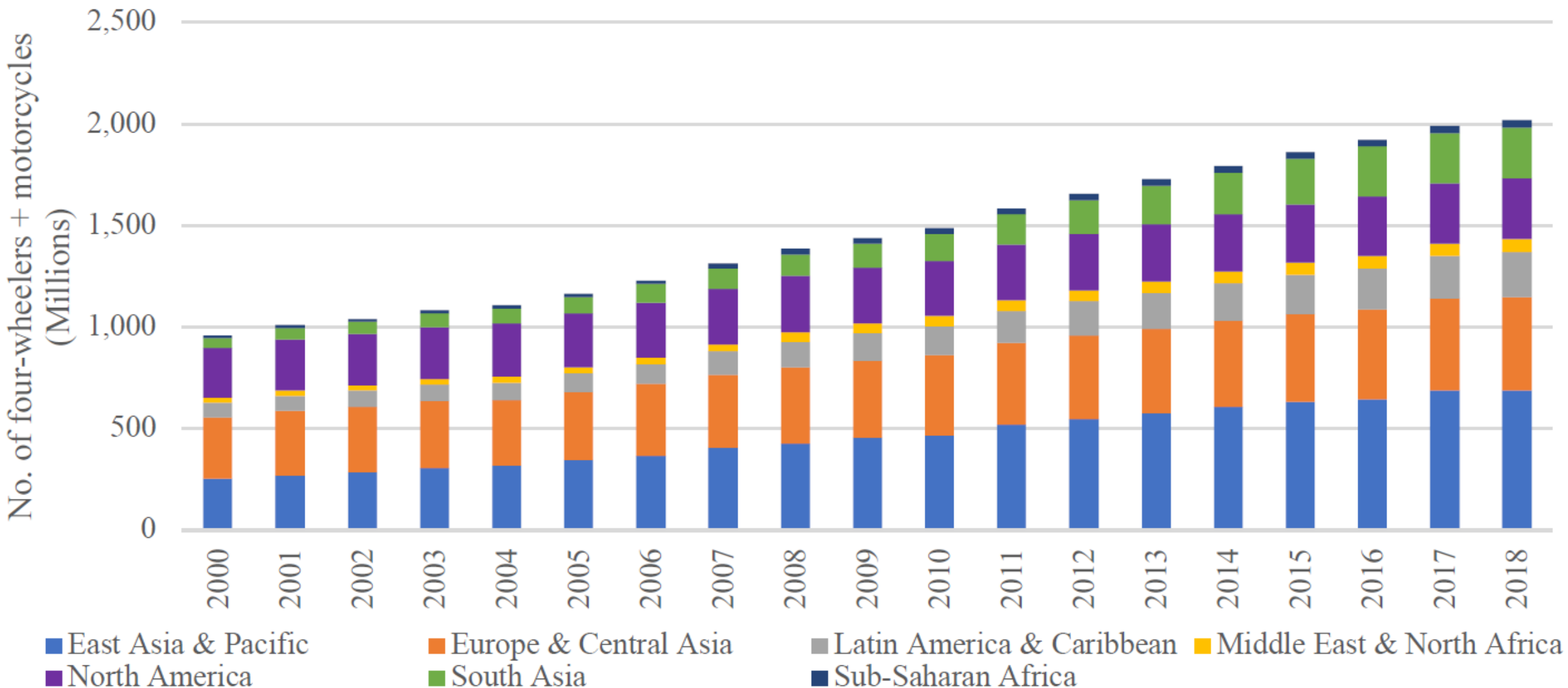
Work ▾ Education ▾ Features ▾ Resources ▾ Pricing Talk to sales

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# World road vehicle fleet in use trend



# Vehicle data sources

- Vehicle manufacturer (market, technology, compliance/standards)
- Legal and financial framework development (safety and environmental regulations, taxes)
- Civil society (pressure groups) and governance
- Traffic management and road infrastructure investment
- Air quality control and health protection
- Environmental protection awareness

# Road transportation data types

## Developing country context

- Activity Data (Fuels, Vehicle stock)
  - Unit Emission Factors (Fuel, Vehicle km)
  - Vehicle fleet characterization
  - Driving conditions and parameters
- 
- \* **Developed countries:** vehicle manufacturer, regulations (implementation of emission standards), fleet and traffic observatories, professional associations, scientific research, etc.
  - \* **Developing countries:** importer (new, used), vehicle assembler, absence of standards, absence of observatories, weak scientific research, etc.

# Major data challenges for developing countries

Vehicle fleet composition, annual mileage and traffic characteristics 1/2

- **Weak Vehicle Registration Systems:** fragmented, decentralized with gaps or inaccuracies in recorded data
- **Limited Institutional Capacity:** lack of resources, expertise, and technology to maintain accurate and comprehensive records (updating)
- **Lack of Data Collection Infrastructure and Management:** requires investment which is not prioritized over issues such as poverty reduction, health, and education
- **Limited Financial and human Resources for Surveys and Studies:** collecting accurate vehicle mileage and other road vehicle driving parameters data require extensive surveys.

# Major data challenges for developing countries

Vehicle fleet composition, annual mileage and traffic characteristics

2/2

- **Infrequent Vehicle Inspections:** I/M is poorly enforced, or absent, data collected is not always centralized or properly utilized.
- **Adoption of Emission Standards with Inconsistent Implementation:** Several countries adopted pollutant emission standards (Euro, US standards or equivalents) but not fully implemented, Fuel quality regulations partially implemented and fuel composition data not collected.
- **Challenges with Imported Used Vehicles:** incomplete or inadequate data recorded

# Conclusions

1. **Vehicle Fleet Data:** Lack, limited or outdated records of vehicle fleets.
2. **Fuel Consumption Data and characteristics:** Lack of accurate data on fuel sales, fuel usage and fuel quality.
3. **Traffic and Road Use Patterns data:** Lack or poor data on vehicle road traffic.
4. **Emission Factors:** Lack of country specific emission factors, use of default EFs.
5. **Vehicle Characteristics:** Lack of data on aging and maintenance per vehicle category.
6. **Low technical Expertise:** Lack trained personnel and institutions to develop comprehensive GHG inventories for road transportation.

# Session 3

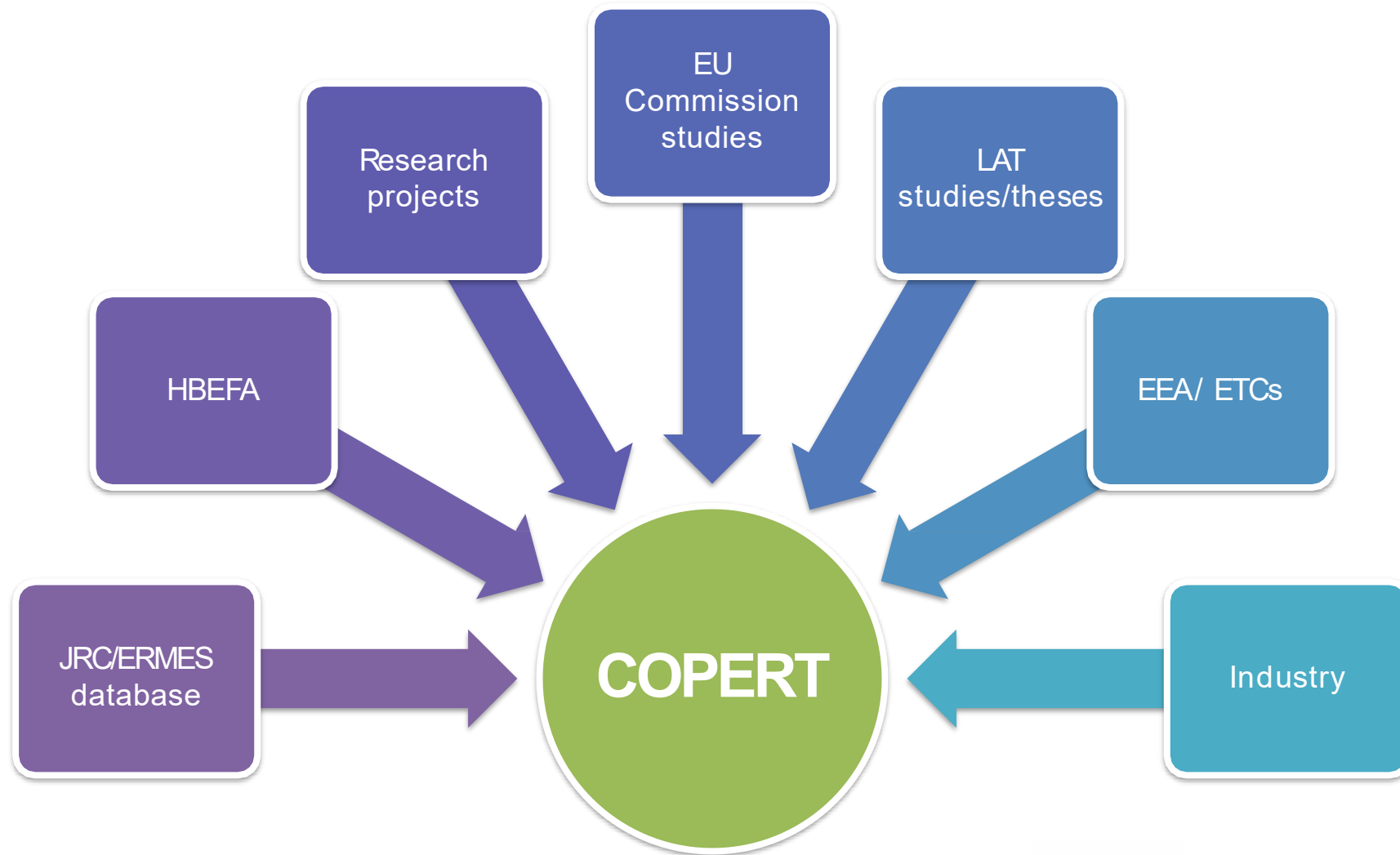
## Using the Copert model: interface and functions

**By the end of this session, you will learn about :**

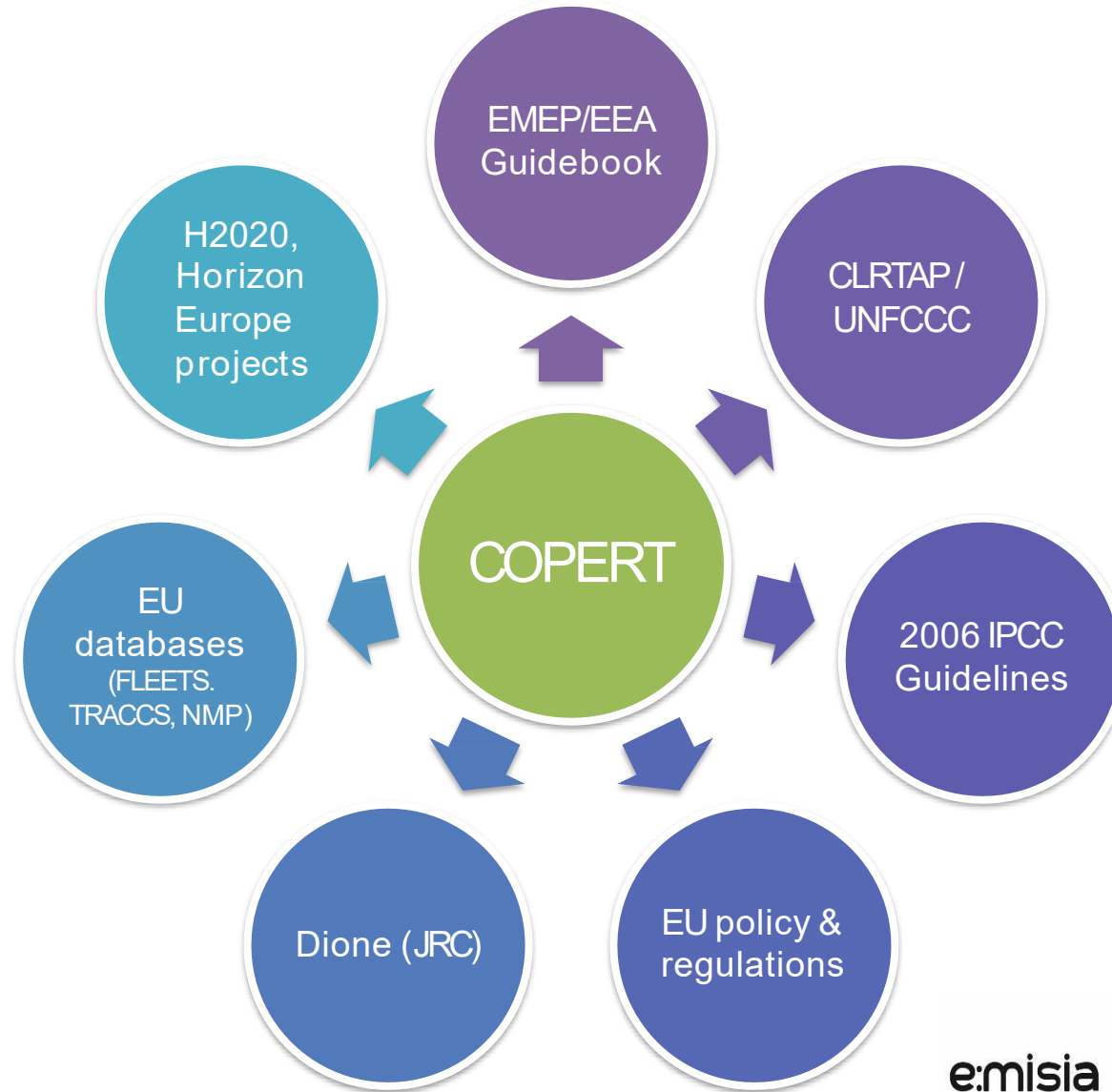
1. Copert interface description and its structure
2. Copert data requirements to apply higher tier methods (T2, T3)

**Learning objectives**

# COPERT inputs



# COPERT usage



# COPERT 5 Interface

**Status**

File

Country :  
Run Mode :  
Created :  
Saved :

----- ; -----

Fuel Balance :  
Improved Fuel Quality Year :  
Mileage Degradation :  
Lube-Oil CO2 Effect :  
A/C Effect :  
CO2 Effect :  
SCR CO2 Effect :

Fuel Balance Calculated :

Perform Energy Balance

Emissions Calculated :

Calculate Emissions

All

Calculate All

Configuration

Perform automatic energy balance  
 Add CO2 Emissions Due to Lube-C  
 Enable A/C Calculations

# Selection of the Tier mode: Tier 2 or Tier 3

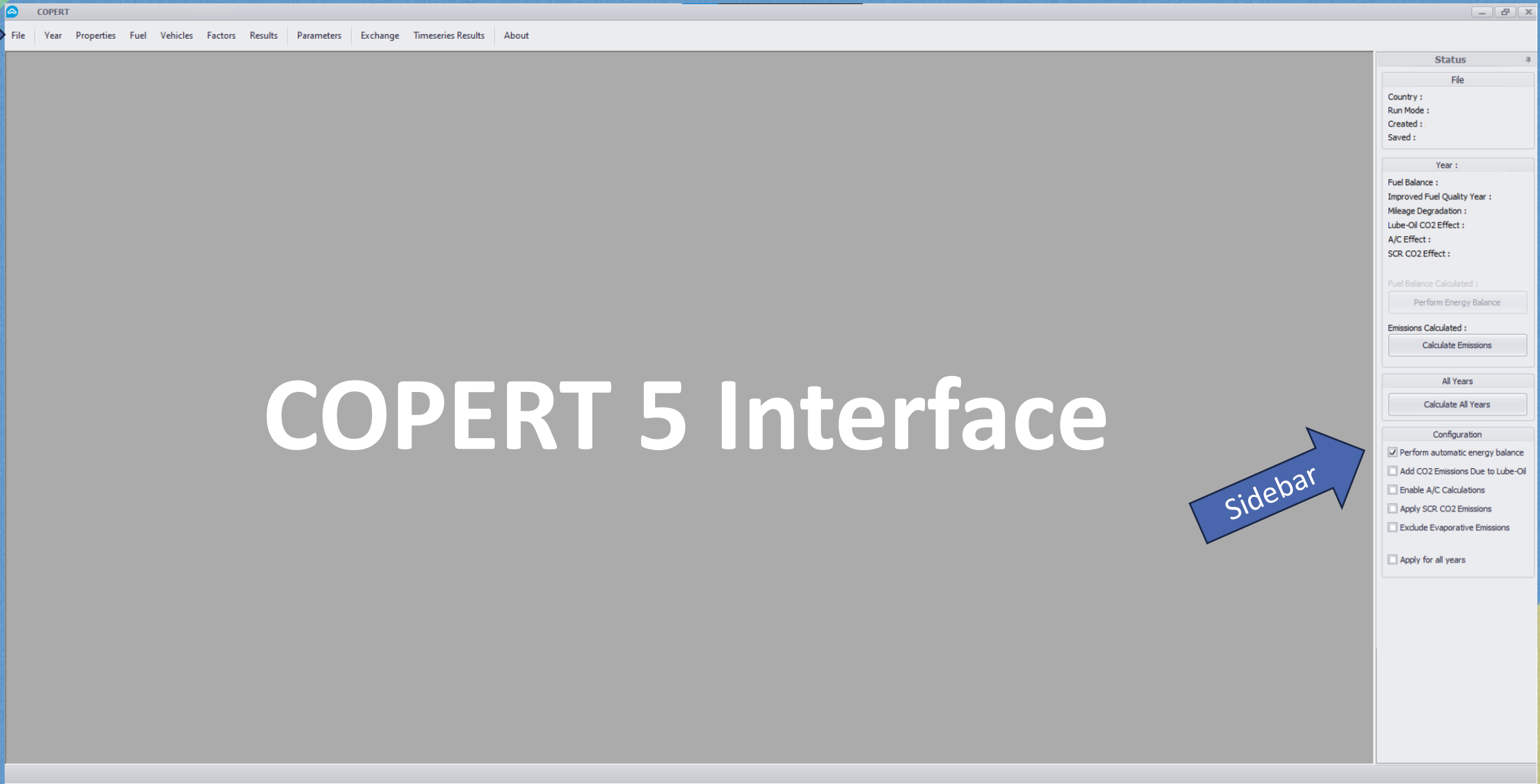
The image shows a 'Create file' dialog box with the following sections:

- Country name**:
  - Continent : AFRICA
  - Country : Algeria
  - Custom name
  - Name :
- Run mode**:
  - Timeseries
  - Entity :
- Tier mode**:
  - Tier 2
  - Tier 3

Buttons: Create, Cancel

# Interface COPERT 5.8.1

Menu



Sidebar

# COPERT 5 Interface

# Interface COPERT 5.8.1: Menu of Tier 2

The screenshot displays the COPERT 5.8.1 software interface. The title bar reads "COPERT - Algeria.cop". The menu bar includes: File, Year, Properties, Fuel, Vehicles, Results, Exchange, Timeseries Results, and About. Two red arrows point to the "Vehicles" and "Results" menu items. The main workspace is a large grey rectangle. On the right side, there is a "Status" panel with the following sections:

- Status**
- File**
  - Country : **Niger**
  - Run Mode : **Timeseries**
  - Created : **01 Mar 2023, 10:42**
  - Saved : **05 Mar 2023, 16:59**
- Year : 2022**
- Fuel Balance : NO**
  - Improved Fuel Quality Year : **1996**
  - Mileage Degradation : **No Effect**
  - Lube-Oil CO2 Effect : **NO**
  - A/C Effect : **NO**
  - CO2 Effect : **NO**
  - SCR CO2 Effect : **NO**
- Fuel Balance Calculated :
  - Perform Energy Balance
- Emissions Calculated : YES**
  - Calculate Emissions
- All Years**
  - Calculate All Years
- Configuration**
  - Perform automatic energy balan
  - Add CO2 Emissions Due to Lube-
  - Enable A/C Calculations
  - Enable CO2 Correction
  - Apply SCR CO2 Emissions
  - Exclude Evaporative Emissions
  - Apply for all years

# COPERT 5.8.1 interface: Detailed Menu of Tier 2

The screenshot displays the COPERT 5.8.1 software interface for Algeria. The main window is titled "COPERT - Algeria.cop" and features a menu bar with the following options: File, Year, Properties, Fuel, Vehicles, Results, Exchange, Timeseries Results, and About. The "Year" menu is open, showing options: Add Entity (Ctrl+E), Copy Entity (Ctrl+P), Remove Entity (Ctrl+U), Add Year (Ctrl+Y), Copy Year (Ctrl+T), Remove Year (Ctrl+R), Select (Ctrl+D), and Close. The "Fuel" menu is open, showing: Statistical Consumption, Share of ETBE in Bioethanol, Share of FAME in Biodiesel, Stock Configuration (Ctrl+F, Ctrl+V), Stock & Activity Data, and SCR Usage. The "Results" menu is open, showing: Total Emissions, Implied Emission Factors, and NMVOC Speciation. The "Exchange" menu is open, showing: Export Input Structure (Excel File), Export Factors (Excel File), Export Results (Excel File), Export Energy & GHG breakdown (Excel File), Import Input Data (Excel File), Export CRF (Excel File), and Export NFR (Excel File). The "Timeseries Results" menu is open, showing: Total Emissions and Implied Emission Factors. The "About" menu is open, showing: Status, File, Country: Algeria, Run Mode: Timeseries, Created: 22 Apr 2024, 15:21, Saved: 22 Apr 2024, 15:23, Year: 2023, Fuel Balance: NO, Improved Fuel Quality Year: 1996, Mileage Degradation: No Effect, Lube-Oil CO2 Effect: NO, A/C Effect: NO, SCR CO2 Effect: NO, Fuel Balance Calculated: Perform Energy Balance, Emissions Calculated: NO, Calculate Emissions, All Years, Calculate All Years, Configuration, Perform automatic energy balance, Add CO2 Emissions Due to Lube-Oil, Enable A/C Calculations, Apply SCR CO2 Emissions, Exclude Evaporative Emissions, and Apply for all years.

# COPERT 5.8.1 : Menu of Tier 3

The screenshot displays the COPERT 5.8.1 software interface for 'Algeria Tier 3.cop'. The menu bar includes 'File', 'Year', 'Properties', 'Fuel', 'Vehicles', 'Factors', 'Results', 'Parameters', 'Exchange', 'Timeseries Results', and 'About'. The 'Factors' and 'Parameters' menu items are circled in red. The main workspace is a large grey area. The right sidebar, titled 'Status', contains the following sections:

- File**
  - Country : **Algeria**
  - Run Mode : **Timeseries**
  - Created : **22 Apr 2024, 15:21**
  - Saved : **22 Apr 2024, 15:23**
- Year : 2023**
  - Fuel Balance : **NO**
  - Improved Fuel Quality Year : **1996**
  - Mileage Degradation : **No Effect**
  - Lube-Oil CO2 Effect : **NO**
  - A/C Effect : **NO**
  - SCR CO2 Effect : **NO**
- Fuel Balance Calculated :**
  - Perform Energy Balance
- Emissions Calculated : NO**
  - Calculate Emissions
- All Years**
  - Calculate All Years
- Configuration**
  - Perform automatic energy balance
  - Add CO2 Emissions Due to Lube-Oil
  - Enable A/C Calculations
  - Apply SCR CO2 Emissions
  - Exclude Evaporative Emissions
  - Apply for all years

# COPERT 5.8.1 Interface: Detailed menu of Tier 3

The screenshot displays the COPERT 5.8.1 software interface, showing a detailed menu of Tier 3. The interface is organized into several sections, each containing a list of options:

- File**: Add Entry (Ctrl+E), Copy Entry (Ctrl+C), Remove Entry (Ctrl+D), Add Year (Ctrl+Y), Copy Year (Ctrl+T), Remove Year (Ctrl+R), Select (Ctrl+S), Close.
- Properties**: Environmental Information, Trip Characteristics.
- Fuel**: Specifications, Advanced Specifications, Lubricants Specifications, Statistical Consumption, Reid Vapor Pressure, Share of ETBE in Bioethanol, Share of FAME in Biodiesel.
- Vehicles**: Stock Configuration (Ctrl+F, Ctrl+V), Stock & Activity Data, Circulation Data, Fuel Evaporation Data, Driving Conditions, Axles Number, SCR Usage, A/C Usage, Technology Share, Blend Share, Bifuel Share.
- Factors**: Hot, Cold, Cold for SPN23 and PM Exhaust, Evaporation, Beta, A/C, Mileage Degradation, Lubricant, Fuel Effect.
- Results**: Total Emissions, Implied Emission Factors, NMVOC Speciation, Energy & GHG breakdown.
- Parameters**: Hot, Cold, Cold for SPN23 and PM Exhaust, A/C, Mileage Degradation, Lubricant Consumption, NMVOC, CH4 Cold, Parameters for NH3 & N2O, Share of NO2 over NOx, Share of EC & OM over PM, Beta Correction Factor, Vehicle performance improvement, Mapping HDVs to/from VECTO Groups.
- Exchange**: Export Input Structure (Excel File), Export Factors (Excel File), Export Results (Excel File), Export Energy & GHG breakdown (Excel File), Import Input Data (Excel File), Export CRF (Excel File), Export NFR (Excel File).
- Timeseries Results**: Total Emissions, Implied Emission Factors.
- About**: Status panel showing Country: Algeria, Run Mode: Timeseries, Created: 22 Apr 2024, 15:21, Saved: 22 Apr 2024, 15:23, Year: 2023, Fuel Balance: NO, Improved Fuel Quality Year: 1996, Mileage Degradation: No Effect, Lube-Oil CO2 Effect: NO, A/C Effect: NO, SCR CO2 Effect: NO, Perform Energy Balance, Emissions Calculated: NO, Calculate Emissions, All Years, Calculate All Years, Configuration, Perform automatic energy balance, Add CO2 Emissions Due to Lube-Oil, Enable A/C Calculations, Apply SCR CO2 Emissions, Exclude Evaporative Emissions, Apply for all years.

# Wizard execution

After creating or opening an inventory file, one can use a wizard, which performs the basic steps in order to produce and calculate a complete run.

The image displays the 'New Run Wizard' dialog box in two states. The first dialog shows step 1 'Add Year' selected, and the second dialog shows step 7 'Stock Configuration' selected. A red arrow points from the 'File' menu to the first dialog.

**File** | Year | Properties | Fuel | Vehicles

- Create Ctrl+N
- Create with Wizard**
- Open... Ctrl+O
- Open recent file ▶
- Rename
- Save... Ctrl+S
- Save as... Ctrl+Shift+S
- Close Ctrl+W
- Exit Ctrl+Q

**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 Next Close

Just press 'Next' and follow the instructions

# Live Demonstration of COPERT interface

# Answers to challenges

# Day 2

**Wednesday 15 October 2025**

**15:00 – 17:00 (Bonn Time)**

# Session 4

## Using Copert model: data input and database construction

**By the end of this session, you will:**

1. Learn how to build and manage the road vehicle database under Copert
2. Know how to input data using wizard and modify default values
3. Use the import and export functions for activity data and results

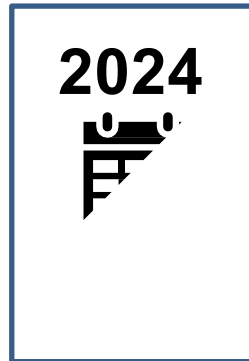


**Learning objectives**

# Where to start – Required input data for Tier 2

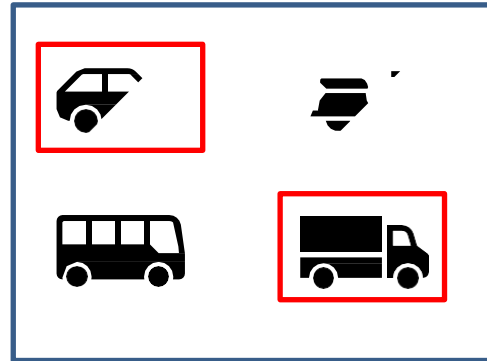
0

## Select year

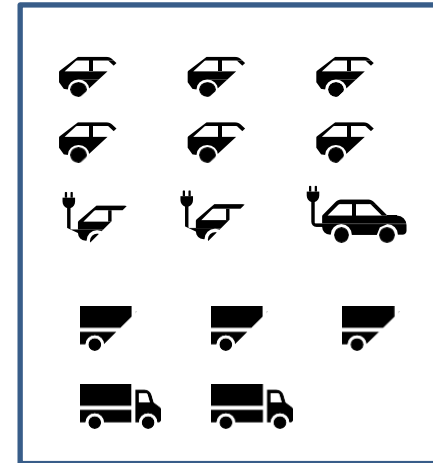


1

## Vehicles in fleet



## Fleet and activity



# Where to start – Required input data for Tier 3

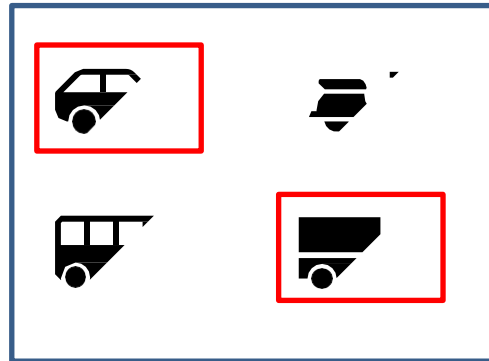
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Select year



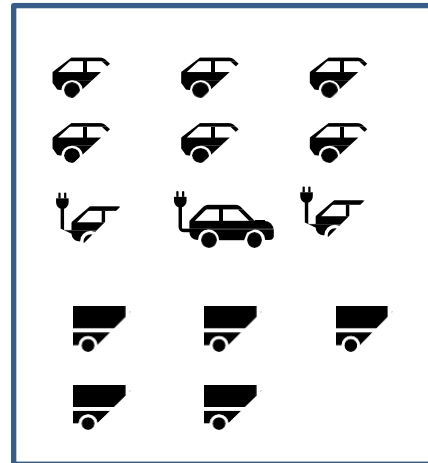
1

Vehicles in fleet



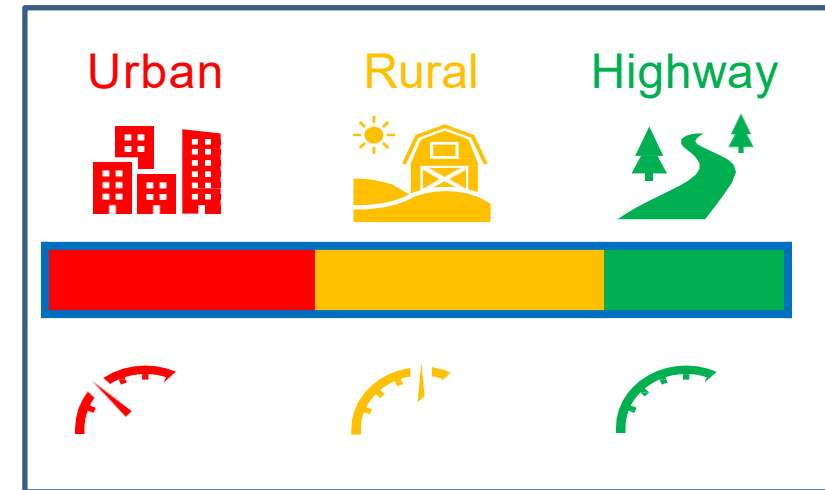
2

Fleet and activity



3

Fleet circulation



# Optional input data

## Environmental info

Month	Min Temperature [°C]	Max Temperature [°C]	Humidity [%]
January	1.2	5.2	0%
February	0.76	5.2	0%
March	3.2	9.2	0%
April	4.2	12.2	0%
May	8.2	17.2	0%
June	11.2	19.2	0%
July	13.2	22.2	0%
August	12.2	22.2	0%
September	11.2	18.2	0%
October	7.2	14.2	0%
November	3.2	8.2	0%
December	2.2	6.2	0%

## Trip & driving info

Category	Trip Length [km]	Trip Duration [hour]
Passenger Cars	12	0.25
Light Commercial Vehicles	12	0.25
Heavy Duty Trucks	44	0.85
Buses	44	0.85
L-Category	12	0.25

## Fuel specifications

Primary Fuel	Specifications			
	Energy Content [MJ/kg]	H:C Ratio [-]	O:C Ratio [-]	Density [kg/m3]
Petrol Grade 1	43.774	1.86	0	750
Petrol Grade 2	43.774	1.86	0	750
Diesel Grade 1	42.695	1.86	0	840
Diesel Grade 2	42.695	1.86	0	840
LPG Grade 1	46.564	2.525	0	520
LPG Grade 2	46.564	2.525	0	520
CNG	48	4	0	175
Biodiesel	37.3	1.95	0.11	890
Bioethanol	28.8	3	0.5	794

## Statistical Consumption

Primary Fuel	Total Fuel sales [TJ]
Petrol Grade 1	0
Petrol Grade 2	0
Diesel Grade 1	0
Diesel Grade 2	0
LPG Grade 1	0
LPG Grade 2	0
CNG	0
Biodiesel	0
Bioethanol + ETBE	0
Electricity	0

## Emission Factors

Category	Fuel	Segment	Euro Standard	Pollutant	Urban Off Peak [g/km]	Urban Peak [g/km]	Rural [g/km]	Highway [g/km]
Passenger Cars	Petrol	Mini	Euro 4	CO	0.18	0.18	0.25	0.41

# Needed data Input

1. **Fleet** (vehicle fleet in operation per category)
  - A. Passenger transport (passenger cars, buses, L-category vehicles)
  - B. Freight transport (light commercial vehicles, heavy duty trucks)
  - C. 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 [°C]
6. **Fuel consumption:** sales (Statistics) [TJ]
  - Energy content of primary fuels [MJ/kg]
  - Fuel mixture(s) used
  - Energy share of fuel mixtures [%]

# Exercise

- Data input (manually)
- Data import (excel file)
- Export of database

# Data Input

1. Data entry on COPERT interface (Tier 2 & Tier 3)
2. Export of data entered on COPERT (Tier 2 & Tier 3) to Excel file
3. Modification of data (Tier 2 & Tier 3) in COPERT file and Excel file
4. Import modified (Tier 2 & Tier 3) Excel data file to COPERT

# Hands-on exercises to enter, select and modify data

## Online demonstration of COPERT functions of data input

- 1- Use Excel file « Session 5 Exercise T2 »
- 2- Use Excel file « Session 5 Exercise T3 »

## Exercise 1- Session 5 : Part A

### Part A

Use the Excel file provided named « **Session 5 exercise T2** » with a dummy vehicle data fleet for one year to build the database under Copert to estimate GHG emissions with Tier 2.

- Create a new file of the vehicle fleet considering all vehicle categories and standards to start data input manually (with wizard and without wizard) using Tier 2.
- Calculate GHG emissions with Tier 2, then display results on the screen and export to excel file. Open the results excel file to manage the results.
- Modify data (vehicle stock and mileage (mean activity)) in the excel file and save it as « **Session 5 exercise T2 revised** ».
- Use the import function to import the revised data from the excel file named « **Session 5 exercise Tier 2 revised** » and recalculate GHG emissions, then display results on the screen and export to excel file. Open the results excel file to manage the results.

# Exercise 1- Session 5: Part B

## Part B

Use the Excel file provided named « **Session 5 exercise T3** » with a dummy vehicle data fleet for one year to build the database under Copert to estimate GHG emissions with Tier 3.

- Create a new file of the vehicle fleet considering all vehicle categories with their standards, driving conditions and environmental information to start data input manually (with wizard and without wizard) using Tier 3.
- Calculate GHG emissions with Tier 3 then display results on the screen and export to excel file. Open the results excel file to manage the results.
- Modify data (vehicle stock and mileage (mean activity), Speed and road share) in the excel file and save it as « **Session 5 exercise T3 revised** ».
- Use the import function to import the revised data from the excel file named « **Session 5 exercise Tier 3 revised** » and recalculate GHG emissions then display results on the screen and export to excel file. Open the results excel file to manage the results.

# Conclusions

- Practical use of COPERT features
- Building the vehicle fleet database with many features: saving, sharing, revising, updating under two formats (Copert file ad XLS file), etc.
- Input data manually or import XLS file or Copert file (.cop)
- Tier 2 and Tier 3 applied
- Emissions of all pollutants from road transportation (GHG, Precursors, NMVOCs)
- All categories of road vehicles covered

# Answers to challenges

# Session 5

## Using Copert : implementing higher tiers for estimating GHG emissions from road transportation

**By the end of this session, you will:**

1. Know how to apply tier 2 and tier 3
2. Compare results by tier for GHG, precursors
3. Note the challenges faced for each tier

**Learning objectives**

# Hands-on Exercise to estimate GHG emission with Tier 2

1. - Calculation of road transport emissions with Tier 2
2. - Use of Dummy data set vehicle stock (2016 – 2020)
3. - Use of average annual mileage travelled by each vehicle category

**Online Demonstration using COPERT**

# Hands-on Exercise to estimate emission with Tier 3

1. Calculation of GHG road transportation emissions with Tier 3 method
2. Use of data set from the vehicle stock (2016 – 2020)
3. Use of average annual mileage travelled by each vehicle category
4. Use of traffic activity data (average urban speeds) for different categories of vehicles

**Online Demonstration using COPERT**

## Exercise 2 – Session 6

### Part A

Use the national vehicle fleet given in excel file « **Session 6 Exercise T2&3 – National Vehicle Fleet** » to build the database on Copert for years 2016-2020 and then calculate GHG emissions for the whole timeseries (2016-2020) series using Tier 2.

- Export input structure to Excel file (version 2010)
- Export emission results to Excel file (version 2010)

### Part B

Use the national vehicle fleet given in excel file « **Session 6 Exercise T2&3 – National Vehicle Fleet** » to build the database on Copert for years 2016-2020 and then calculate GHG emissions for the whole timeseries (2016-2020) series using Tier 3.

- Export input structure to Excel file (version 2010)
- Export emission results to Excel file (version 2010)

# Conclusions

- COPERT does not use Tier 1 method
- COPERT applies only higher tiers methods (Tier 2 and Tier 3)
- Accuracy of calculation results and large range of pollutants covered (GHG, precursors and fugitives)
- Required input data and calculation steps for Tier 2 and Tier 3 methods
- Need of development of practical skills to use COPERT

# Answers to challenges

# Day 3

**Thursday 16 October 2025**

**15:00 – 17:00 (Bonn Time)**

# Session 6

**Other applications of COPERT : Energy balance of road transportation, GHG emission and fuel consumption projections (Nationally Determined Contributions), tracking mitigation actions**

**By the end of this session, you will:**

1. Learn how to develop and improve national energy balance of road transportation
2. Know how to develop scenarios and estimate emission projections and estimate reductions for actions in road transportation

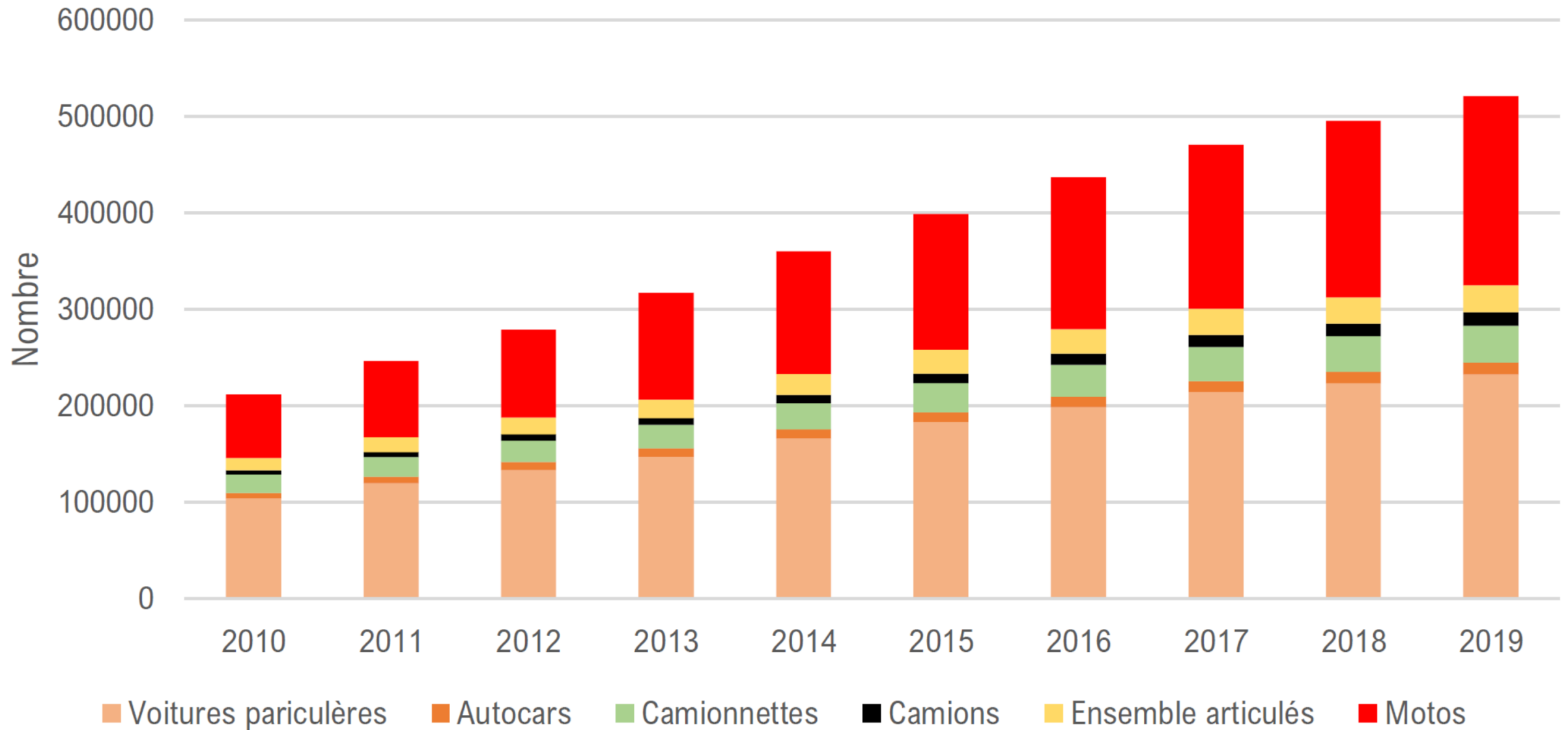


**Learning objectives**

# Hands-on exercises 1/2

**Estimation of fuel balance from road transportation**

# National vehicle stock (Dummy country)



# Assumptions on vehicle annual mileage travelled

Vehicles	Fuels	Assumptions
		Average annual mileage (km/y)
Passenger Cars	Petrol	8 000
	Diesel	8 000
Light Commercial Vehicles	Petrol	10 000
	Diesel	10 000
Heavy Duty Trucks Rigid	Diesel	13 000
Heavy Duty Trucks – Articulated	Diesel	13 000
Buses - Coaches Standard	Diesel	15 000
Mopeds 2-stroke	Petrol	3 000

# Fuel consumption estimation by COPERT using vehicle stock data and assumptions on mileage

Years	2016	2017	2018	2019	2020
<b>Passenger Cars</b>	<b>4 128</b>	<b>3 952</b>	<b>3 666</b>	<b>4 391</b>	<b>4 693</b>
<b>Petrol</b>	<b>2 014</b>	<b>1 929</b>	<b>1 789</b>	<b>2 143</b>	<b>2 290</b>
Small	2 014	1 929	1 789	2 143	2 290
<b>Diesel</b>	<b>2 113</b>	<b>2 023</b>	<b>1 877</b>	<b>2 248</b>	<b>2 403</b>
Small	2 113	2 023	1 877	2 248	2 403
<b>Light Commercial Vehicles</b>	<b>930</b>	<b>895</b>	<b>836</b>	<b>996</b>	<b>1 050</b>
<b>Petrol</b>	<b>371</b>	<b>357</b>	<b>334</b>	<b>395</b>	<b>419</b>
N1-I	371	357	334	395	419
<b>Diesel</b>	<b>559</b>	<b>538</b>	<b>503</b>	<b>602</b>	<b>631</b>
N1-I	559	538	503	602	631
<b>Heavy Duty Trucks</b>	<b>4 249</b>	<b>4 101</b>	<b>3 750</b>	<b>4 449</b>	<b>4 787</b>
<b>Diesel</b>	<b>4 249</b>	<b>4 101</b>	<b>3 750</b>	<b>4 449</b>	<b>4 787</b>
Rigid 7,5 - 12 t	1 384	1 298	1 204	1 491	1 614
Articulated 34 - 40 t	2 865	2 803	2 546	2 958	3 174
<b>Buses</b>	<b>2 296</b>	<b>2 219</b>	<b>2 083</b>	<b>2 435</b>	<b>2 532</b>
<b>Diesel</b>	<b>2 296</b>	<b>2 219</b>	<b>2 083</b>	<b>2 435</b>	<b>2 532</b>
Coaches Standard <=18 t	2 296	2 219	2 083	2 435	2 532
<b>L-Category</b>	<b>582</b>	<b>559</b>	<b>516</b>	<b>624</b>	<b>666</b>
<b>Petrol</b>	<b>582</b>	<b>559</b>	<b>516</b>	<b>624</b>	<b>666</b>
Mopeds 2-stroke <50 cm <sup>3</sup>	582	559	516	624	666
<b>Total</b>	<b>12 185</b>	<b>11 726</b>	<b>10 852</b>	<b>12 895</b>	<b>13 729</b>

# Data Comparison: COPERT and Statistics

Results of COPERT calculation

Years	Fuels	2016	2019	2020	Assumptions on Average Annual Mileage
		(TJ)	(TJ)	(TJ)	(km/y)
Passenger Cars	Petrol	2 014	2 143	2 290	8 000
	Diesel	2 113	2 248	2 403	8 000
Light Commercial Vehicles	Petrol	371	395	419	10 000
	Diesel	559	602	631	10 000
Heavy Duty Trucks Rigid	Diesel	1 384	1 491	1 614	13 000
Heavy Duty Trucks – Articulated	Diesel	2 865	2 958	3 174	13 000
Buses - Coaches Standard	Diesel	2 296	2 435	2 532	15 000
Mopeds 2-stroke	Petrol	582	624	666	3 000

<b>Road Transportation</b>	<b>Totals</b>	COPERT	<b>12 185</b>	<b>12 895</b>	<b>13 729</b>
		AIE data	<b>15 144</b>	<b>16 394</b>	<b>15 818</b>
		UN statistics		<b>14 583</b>	<b>14 669</b>
		National Statistics	<b>15 047</b>	<b>16 287</b>	<b>15 742</b>
	<b>Difference = National - Copert</b>	<b>TJ</b>	<b>2 863</b>	<b>3 391</b>	<b>2 014</b>
		<b>ktep</b>	<b>68</b>	<b>81</b>	<b>48</b>

## Hands-on exercises 2/2

**Estimation of emission projections for different scenarios of road transportation**

# Assumptions for road transportation scenarios

- **Vehicle stock**: number of vehicles registered (new, used) per category, fuel , age, technology (new transportation policy, vehicle emission regulations , vehicle incentives, etc.)
- **Vehicle use**: public transportation policy, fuel pricing, regulations, inspection & maintenance,
- **Road traffic characteristics** : road type, speed, mileage, hot and cold start (infrastructure, traffic management plan, etc.),

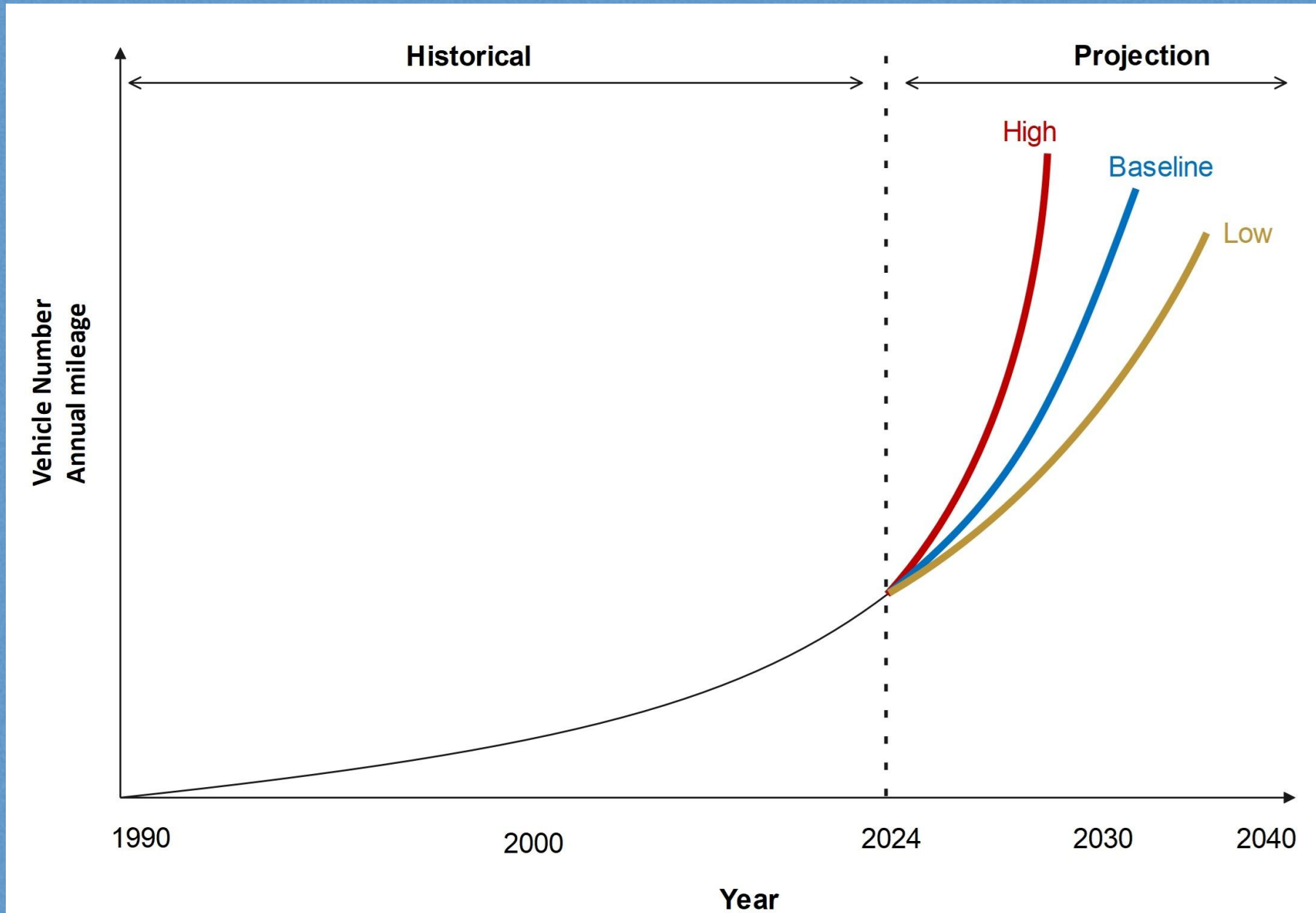
# Current vehicle stock

Category	Fuel	Segment	Euro Standard	1990	1995	2000	2005	2010	2015	2020	2024	2030	2035	2040
Passenger Cars	Petrol	Small	Euro 1	X	X	X	X	X	X	X	X	?	?	?
Passenger Cars	Petrol	Medium	Euro 1	X	X	X	X	X	X	X	X	?	?	?
Passenger Cars	Petrol	Large-SUV-Executive	Euro 1	X	X	X	X	X	X	X	X	?	?	?
Passenger Cars	Diesel	Small	Euro 1	X	X	X	X	X	X	X	X	?	?	?
Passenger Cars	Diesel	Medium	Euro 1	X	X	X	X	X	X	X	X	?	?	?
Passenger Cars	Diesel	Large-SUV-Executive	Euro 1	X	X	X	X	X	X	X	X	?	?	?
Light Commercial Vehicles	Petrol	N1-I	Euro 1	X	X	X	X	X	X	X	X	?	?	?
Light Commercial Vehicles	Diesel	N1-I	Euro 1	X	X	X	X	X	X	X	X	?	?	?
Buses	Diesel	Urban Buses Midi <=15 t	Euro I	X	X	X	X	X	X	X	X	?	?	?
Buses	Diesel	Urban Buses Standard 15 - 18 t	Euro I	X	X	X	X	X	X	X	X	?	?	?

# Vehicle stock evolution

Category	Fuel	Segment	Euro Standard	1990	1995	2000	2005	2010	2015	2020	2024	2030	2035	2040
Passenger Cars	Petrol	Small	Euro 1	X	X	X	X	X	X	X	X	XX	XXX	XXX
Passenger Cars	Petrol	Medium	Euro 1	X	X	X	X	X	X	X	X	X	XXX	XXX
Passenger Cars	Petrol	Large-SUV-Executive	Euro 1	X	X	X	X	X	X	X	X	x	x	x
Passenger Cars	Diesel	Small	Euro 1	X	X	X	X	X	X	X	X	XX	XXX	XXX
Passenger Cars	Diesel	Medium	Euro 1	X	X	X	X	X	X	X	X	X	XXX	XXX
Passenger Cars	Diesel	Large-SUV-Executive	Euro 1	X	X	X	X	X	X	X	X	x	x	x
Light Commercial Vehicles	Petrol	N1-I	Euro 1	X	X	X	X	X	X	X	X	X	X	X
Light Commercial Vehicles	Diesel	N1-I	Euro 1	X	X	X	X	X	X	X	X	X	X	X
Buses	Diesel	Urban Buses Midi <=15 t	Euro I	X	X	X	X	X	X	X	X	XXX	XXXX	XXXX
Buses	Diesel	Urban Buses Standard 15 - 18 t	Euro I	X	X	X	X	X	X	X	X	XXX	XXXX	XXXX

# Development of road transportation scenarios



## Exercise 3 – Session 7

### Part A

- Use excel file « **Session 7 Exercise T2 - Scenario Vehicle Fleet Composition-Mileage projection** » to estimate emissions for the whole time series 1990-2040 considering the evolution of the national vehicle fleet and the corresponding mileage assumed. Build the database by applying the import function of Copert.
- Export the results in an excel file (version 2010).
- Export input structure to Excel file (version 2010)

### Part B

Use excel file « **Session 7 Exercise T2 - Scenario technology projection** » to estimate emissions for the whole time series 1990-2040 considering the evolution of the national vehicle fleet and the corresponding mileage with the new technology introduced. Build the database by applying the import function of Copert.

- Export the results in an excel file (version 2010)
- Export input structure to Excel file (version 2010)







# Conclusions

- Fuel consumption calculated (energy balance)
- Building different scenarios for road transportation (with all vehicles and driving parameters)
- Projections of emissions and fuel consumption determined
- Methodologies in line with IPCC 2006
- Reporting in line with UNFCCC reporting guidelines (CRT-MPGs-ETF-Paris Accord)
- Option to enhance NDC ambition from road transportation

# Answers to challenges

# Session 8

## Closing session

- Lessons learnt from the Webinar
- Next steps
- Closing remarks by the UNFCCC Secretariat

UNFCCC  
Transparency Division

**Thanks for your participation and interest in COPERT**

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