COPERT CLI user guide v. 1.0

Contents

Introduction – main features

This document describes the functionalities of the Command Line Interface (CLI) which is a new COPERT feature integrated in the program code. The document will cover the additional capabilities of COPERT under the CLI. All previous functionalities are described in the existing COPERT manual (http://COPERT.emisia.com). The CLI does not introduce new methodological elements which are described in detail in EEA's emission inventory guidebook (https://www.eea.europa.eu/publications/emep-eea-guidebook-2019/part-b-sectoral-guidance-chapters/1-energy/1-a-combustion/1-a-3-b-i/view). The CLI feature will, from now on, follow the development of the software (currently COPERT version 5.4), which means that it will be available to all COPERT users. Therefore, it is advised that users familiarize themselves with the COPERT software before using the CLI interface.

The purpose of this feature is to allow multiple automatic executions of COPERT, by externally providing input data and subsequently receiving results in an external file. Moreover, third party applications (like Matlab or custom software) will be able to execute COPERT via the Command Line Interface to perform automated tasks.

Calculation methodology will follow the COPERT functionalities allowing for emission factor and emission calculation as well as energy consumption calculation. Advanced features of the model can only be run by using the windows version of the tool. The following table lists the features available via the CLI and those available under Windows.

Table 1 List of COPERT functionalities vs COPERT CLI functionalities

CLI available features	Windows available features
Hot emission factor calculation	Hot emission factor calculation
Cold emission factor calculation	Cold emission factor calculation
Hot emissions calculation	Hot emissions calculation
Cold emissions calculation	Cold emissions calculation
Evaporation calculation	Evaporation calculation
User provided implied emission factor	User provided implied emission factor
User provided country name	User provided country name
User selected years	User selected years
Fuel effect	Fuel effect
	Air Condition use
	CO_2 correction calculation
	Mileage degradation effect
	Lubricant specifications
	Energy Balance
	SCR CO2 emission calculation

Installation

No separate installation is required; the feature is integrated in the COPERT installation.

Minimum software requirements

COPERT is a 64-bit application and requires a 64-bit Microsoft Windows operating system.

Microsoft® Windows 7 or newer Windows version.

Minimum hardware requirements

1. 2 GHz, 64-bit processor
2. 8 GB RAM
3. 30 MB for installation, 100 MB for full run
4. Screen Resolution: 1024x768 pixels

Note that a higher frequency processor based computer and/or more on RAM memory are recommended if frequent use of the program is expected.

Execution

The CLI is available on any PC where the COPERT tool is installed. It is called by the Windows command line window. To open the command line window (Figure 1) click Start. In the Search or Run line, type cmd (short for command), and press Enter.
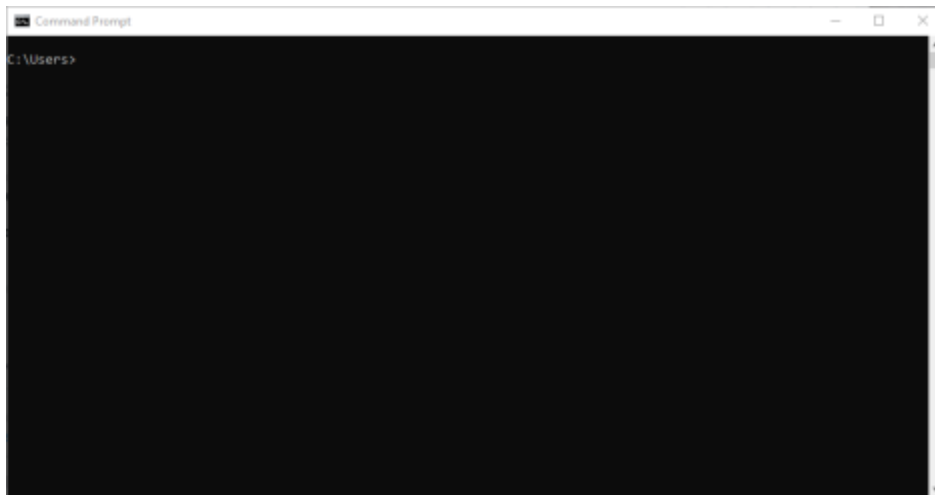
Figure 1 Command line window

A specific syntax must be followed to start the procedure.

CLI execution syntax

The command line syntax is the following:

<COPERT.exe path[1]>/COPERT.exe<one space><input folder path>/<input filename with extension xlsx or json><one space><output folder path>/<output filename with extension xlsx or json><one space><Switch 1[2]><one space><Switch n[2]>

[1] Typical installation path is "C:\Program Files\COPERT 5"

[2] optional, see description below

E.g.: "C:\Program Files\COPERT 5\COPERT.exe" "D:\COPERT_CLI\JRC COPERT CLI example.xlsx" "D:\COPERT_CLI\JRC_results.xlsx"

Figure 2 Example of the CLI execution syntax

Input and output files can be in the same folder; however, the output files must not already exist in the specified folder, otherwise you will get an error message "Output file already exists" (Figure 3).

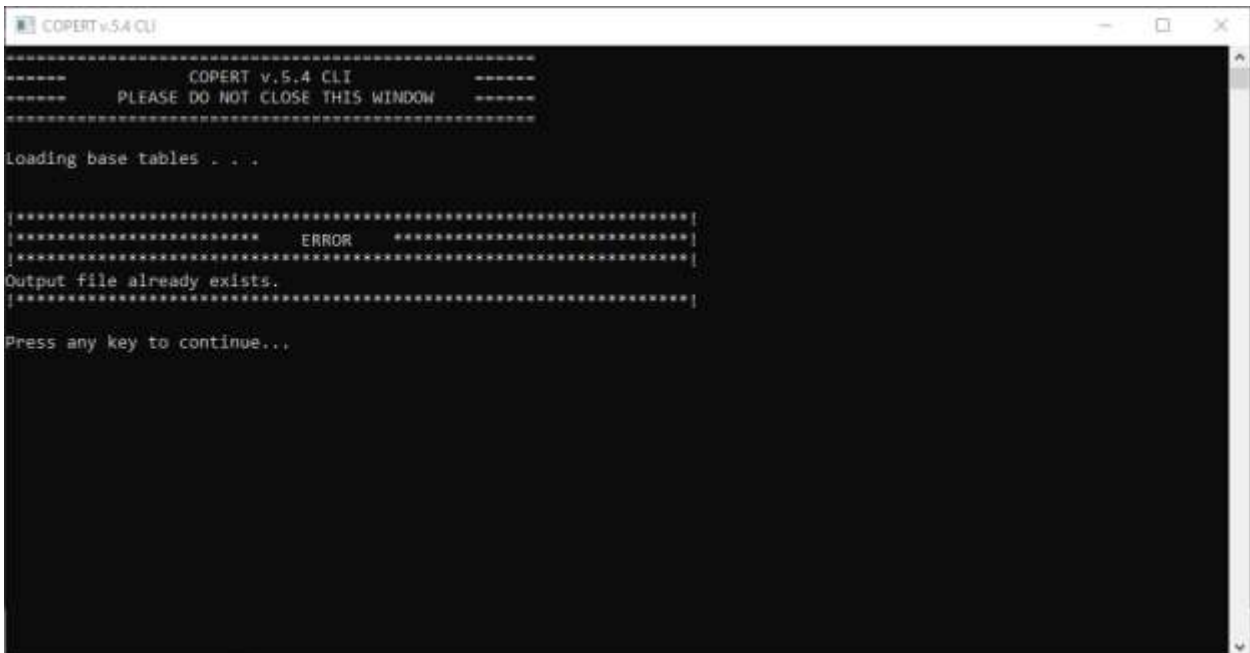The program opens a separate CMD window returning control to the user in the launch window.

Figure 3 Error message: Output file already exist in the specified folder.

CLI file types

Valid input and output file types are Excel and Json files. All 4 filetype combinations for input and output files are possible

Table 2 Filetype conversion combinations

Input file	Output file
xlsx	xlsx
xlsx	json
json	xlsx
json	json

COPERT CLI automatically converts to and from any of the two filetypes during calculation.

E.g.: "C:\Program Files\COPERT 5\COPERT.exe" "D:\COPERT_CLI\JRC COPERT CLI example.xlsx" "D:\COPERT_CLI\JRC_results.json"

Switches

There are two switches used by the CLI, "keep" and "noevap". Both of the switches are optional, and the switch order does not influence the results. The switches should be provided at the end of the basic command (see the following examples).

keep

Eg: "C:\Program Files\COPERT 5\COPERT.exe" "D:\COPERT_CLI\JRC COPERT CLI example.xlsx" "D:\COPERT_CLI\JRC_results.xlsx" keep

When you execute COPERT via the CLI all information is temporarily stored in a COPERT file which is deleted after the completion of the calculations. If the user wishes to keep the file for further processing the "keep" switch at the end of the basic command prevents COPERT from deleting the file. The *.cop file is saved to the same folder as the output file (xlsx or json). If there is a *.cop file with the same name an error occurs, and the process is interrupted (Figure 4).
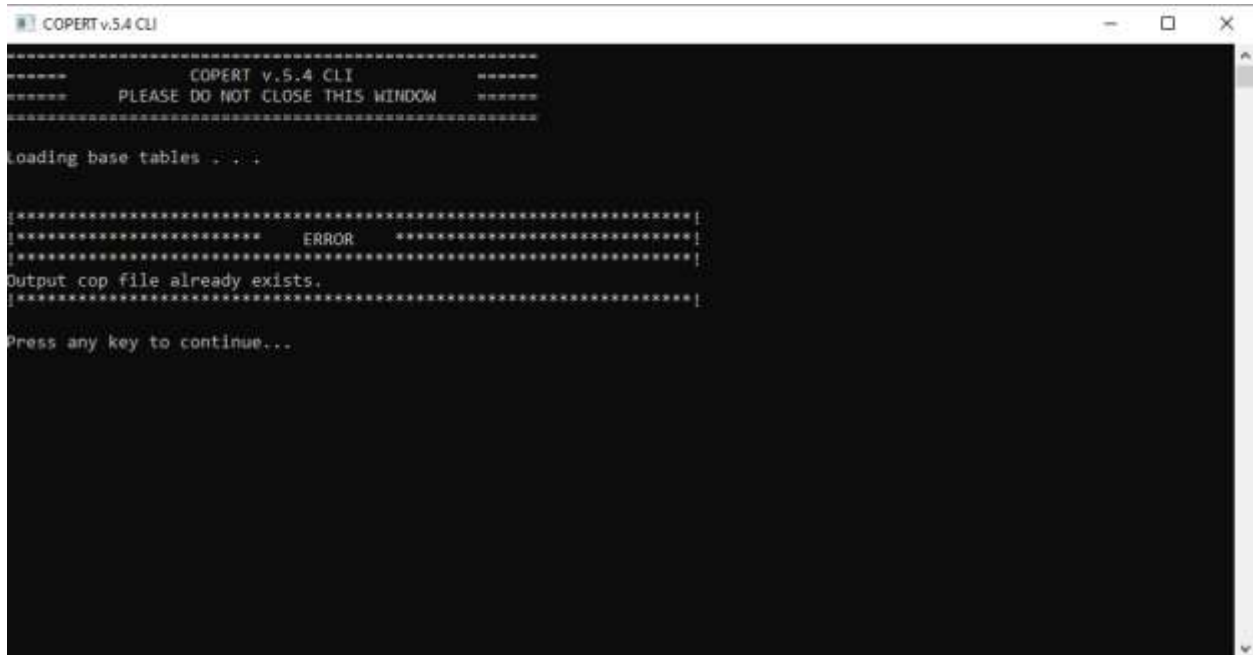
Figure 4 Error message: Output COPERT file already exist in the specified folder.

noevap

Eg: "C:\Program Files\COPERT 5\COPERT.exe" "D:\COPERT_CLI\JRC COPERT CLI example.xlsx" "D:\COPERT_CLI\JRC_results.xlsx" noevap

If the user wants to perform multiple runs of the model and wishes to save up time, there is an option to omit evaporation calculations and reduce calculation time by up to 30%. However, this will have an effect on CO_2 and energy consumption results, so it is best used only for the evaluation of other pollutants, like NOx, PM, CO.

Alternative country name

Eg: "C:\Program Files\COPERT 5\COPERT.exe" "D:\COPERT_CLI\JRC COPERT CLI example.xlsx" "D:\COPERT_CLI\JRC_results.xlsx" UK

By default, COPERT prepares a country named Greece. By providing a country abbreviation as a switch COPERT can change the country name and use the alternative. The list of country names and abbreviations are based on the Alpha-2 code of the ISO 3166 country code. The list of country codes and abbreviations can be found in the ANNEX.

Filetype conversion

The user can employ COPERT CLI to convert a file from xlsx to json and vice versa by using the following command line syntax:

<COPERT.exe path>/COPERT.exe<one space><folder path>/<input filename with extension xlsx ><one space>< folder path>/<output filename with extension json><one space>convert

Eg: "C:\Program Files\COPERT 5\COPERT.exe" "D:\COPERT_CLI\JRC COPERT CLI example.xlsx" "D:\COPERT_CLI\ JRC COPERT CLI example.json" convert

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Input data

As previously mentioned, COPERT CLI can work with json and xlsx files. To produce an xlsx template the windows version of the software can be used. Following the creation of a COPERT run and setting the software for data input:

1. Country selection (File>Create)
2. Year addition (Year>Add new Year)
3. Vehicle selection (Vehicles>Stock Configuration)

the user can then navigate to Exchange>Export Input Structure and create an Excel file to be used by the CLI (Figure 5).
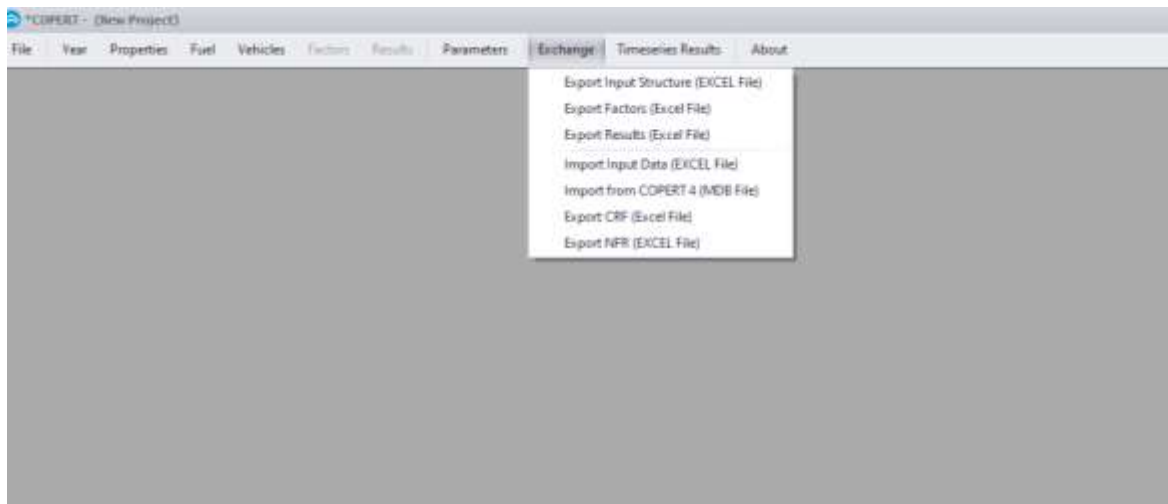
Figure 5 Create an xlsx template for COPERT CLI

COPERT will create an Excel file where input data are provided in separate tabs.

COPERT vehicle categories

For the COPERT vehicle categories the input data that needs to be provided (in order to obtain reasonable and complete results) are the following:

- Min Temperature
- Max Temperature
- Reid Vapor Pressure (in case of evaporation calculations)
- Stock
- Mean Activity
- Lifetime Cumulative Activity (in case of evaporation calculations)
- Urban Peak Speed
- Urban Off-Peak Speed
- Rural Speed
- Highway Speed
- Urban Peak Share
- Urban Off-Peak Share

- Rural Share
- Highway Share
- Fuel Year
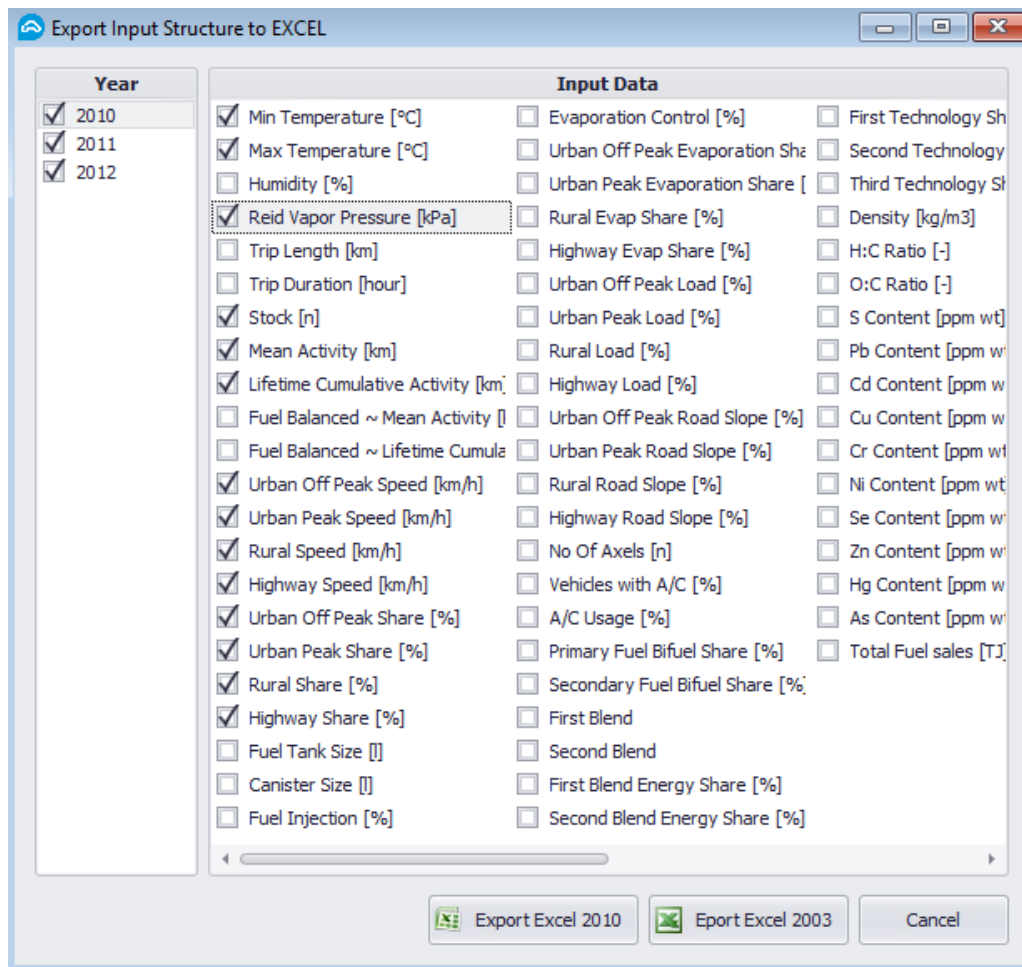
Figure 6 Export input structure form

Non-COPERT vehicle categories

Additional vehicle types can be provided by the user to be calculated along with the standard ones. This can be done by adding at the end of the COPERT list (in the input xlsx file created by COPERT as explained above), the name of the custom vehicle category in the columns "Category", "Fuel", "Segment" and "Euro Standard". Not all of these columns need to be filled but at least one of them. Also, the user has to provide the input information as usual. Required information is standard COPERT information (see Table 3),

Table 3 Standard COPERT required information

Required information
Vehicle stock
Vehicle Mean Activity
Urban peak, Urban off peak, Rural and Highway shares

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and COPERT CLI information, which is the emission factor in unit of mass per unit of activity for the four driving modes (Urban Peak, Urban Off-Peak, Rural and Highway). The column names of the emission factors should have the following structure "YYYY_DM", meaning the year and the driving mode.

The emission factors have to be provided by driving mode and then by year. For example, if the user wants to calculate 3 years (2010, 2011, 2012), they must provide the emission factors respecting a specific column order, firstly the emission factors for urban off peak driving mode, for all years chronologically (2010_OP, 2011_OP, 2012_OP), then for urban peak driving mode, for all years (2010_PK, 2011_ PK, 2012_ PK), etc. (see Figure 7)

Category	Fuel	Segment	Euro Standard	2010_OP	2011_OP	2012_OP	2010_PK	2011_PK	2012_PK	2010_R	2011_R	2012_R	2010_H	2011_H	2012_H
Passenger Cars	Diesel	Hybrid Diesel <2.0 L	Euro 4	0.107427	0.107427	0.107427	0.107427	0.107427	0.107427	0.075199	0.075199	0.075199	0.096685	0.096685	0.096685
Passenger Cars	Diesel	Hybrid Diesel <2.0 L	Euro 5	0.053195	0.053195	0.053195	0.053195	0.053195	0.053195	0.037236	0.037236	0.037236	0.047875	0.047875	0.047875
Passenger Cars	Diesel	Hybrid Diesel <2.0 L	Euro 6 up to 2016	0.077812	0.077812	0.077812	0.077812	0.077812	0.077812	0.054468	0.054468	0.054468	0.070030	0.070030	0.070030
Passenger Cars	Diesel	Hybrid Diesel <2.0 L	Euro 6 2017-2019	0.077847	0.077847	0.077847	0.077847	0.077847	0.077847	0.054493	0.054493	0.054493	0.070062	0.070062	0.070062
Passenger Cars	Diesel	Hybrid Diesel <2.0 L	Euro 6 2020+	0.076673	0.076673	0.076673	0.076673	0.076673	0.076673	0.053671	0.053671	0.053671	0.069006	0.069006	0.069006
Passenger Cars	Petrol/Electric	Plug-in Hybrid 1.4-2.0 l	Euro 4	1.014646	1.014646	1.014646	1.014646	1.014646	1.014646	0.710252	0.710252	0.710252	0.913181	0.913181	0.913181
Passenger Cars	Petrol/Electric	Plug-in Hybrid 1.4-2.0 l	Euro 5	0.935519	0.935519	0.935519	0.935519	0.935519	0.935519	0.654863	0.654863	0.654863	0.841967	0.841967	0.841967
Passenger Cars	Petrol/Electric	Plug-in Hybrid 1.4-2.0 l	Euro 6 up to 2016	0.939386	0.939386	0.939386	0.939386	0.939386	0.939386	0.657570	0.657570	0.657570	0.845448	0.845448	0.845448
Passenger Cars	Petrol/Electric	Plug-in Hybrid 1.4-2.0 l	Euro 6 2017-2019	0.931155	0.931155	0.931155	0.931155	0.931155	0.931155	0.651808	0.651808	0.651808	0.838039	0.838039	0.838039
Passenger Cars	Petrol/Electric	Plug-in Hybrid 1.4-2.0 l	Euro 6 2020+	0.827170	0.827170	0.827170	0.827170	0.827170	0.827170	0.579019	0.579019	0.579019	0.744453	0.744453	0.744453
Passenger Cars	Electricity	Battery Electric Vehicle	Euro 4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Passenger Cars	Electricity	Battery Electric Vehicle	Euro 5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Passenger Cars	Electricity	Battery Electric Vehicle	Euro 6 up to 2016	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Passenger Cars	Electricity	Battery Electric Vehicle	Euro 6 2017-2019	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Passenger Cars	Electricity	Battery Electric Vehicle	Euro 6 2020+	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Passenger Cars	Hydrogen	Fuel Cell Electric Vehicle	Euro 4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Passenger Cars	Hydrogen	Fuel Cell Electric Vehicle	Euro 5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Passenger Cars	Hydrogen	Fuel Cell Electric Vehicle	Euro 6 up to 2016	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Passenger Cars	Hydrogen	Fuel Cell Electric Vehicle	Euro 6 2017-2019	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Passenger Cars	Hydrogen	Fuel Cell Electric Vehicle	Euro 6 2020+	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Passenger Cars	E85	Flexi-fuel Bioethanol 1,4 - 2.0 l	Euro 3	5.045466	5.045466	5.045466	5.045466	5.045466	5.045466	3.531826	3.531826	3.531826	4.540919	4.540919	4.540919
Passenger Cars	E85	Flexi-fuel Bioethanol 1,4 - 2.0 l	Euro 4	1.385221	1.385221	1.385221	1.385221	1.385221	1.385221	0.969655	0.969655	0.969655	1.246699	1.246699	1.246699
Passenger Cars	E85	Flexi-fuel Bioethanol 1,4 - 2.0 l	Euro 5	1.385221	1.385221	1.385221	1.385221	1.385221	1.385221	0.969655	0.969655	0.969655	1.246699	1.246699	1.246699
Passenger Cars	E85	Flexi-fuel Bioethanol 1,4 - 2.0 l	Euro 6 up to 2016	1.385221	1.385221	1.385221	1.385221	1.385221	1.385221	0.969655	0.969655	0.969655	1.246699	1.246699	1.246699
Passenger Cars	E85	Flexi-fuel Bioethanol 1,4 - 2.0 l	Euro 6 2017-2019	1.385221	1.385221	1.385221	1.385221	1.385221	1.385221	0.969655	0.969655	0.969655	1.246699	1.246699	1.246699
Passenger Cars	E85	Flexi-fuel Bioethanol 1,4 - 2.0 l	Euro 6 2020+	1.385221	1.385221	1.385221	1.385221	1.385221	1.385221	0.969655	0.969655	0.969655	1.246699	1.246699	1.246699
		Unit: [g/km]													

Figure 7 Example of filling emission factors for different driving modes and years

It must be noted that the results will have the same units as the emission factor. If the emission factor is provided in g/km the results will also be in grams. For this reason, it is strongly advised to provide emission factors for new vehicles in a way that all vehicle categories (COPERT and non-COPERT) will have the same units. For example, the results of CO_2 emissions for COPERT vehicle categories are displayed in tonnes (t). Thus CO_2 emission factors for non-COPERT vehicle categories should be given in t/km for consistency.

The calculation will follow the basic function for the emission calculation:

Emissions [total] = Emissions [urban peak] + Emissions [urban off-peak] + Emissions [rural] + Emissions [highway]

Emissions [urban peak] = vehicle stock [n] x vehicle mean activity [km] x urban peak share [%] x urban peak emission factor [g/vkm]

Emissions [urban off-peak] = vehicle stock [n] x vehicle mean activity [km] x urban off-peak share [%] x urban off-peak emission factor [g/vkm]

Emissions [rural] = vehicle stock [n] x vehicle mean activity [km] x rural share [%] x rural emission factor [g/vkm]

Emissions [highway] = vehicle stock [n] x vehicle mean activity [km] x highway share [%] x highway emission factor [g/vkm]

Emission factors for each pollutant must be provided in separate sheets named according to COPERT standard sheet naming. As an example, in order to provide the CO_2 emission factor the user must prepare a sheet named "NEW_CO2_EF"* with the following structure:

Table 4 Custom emission factor input sheet structure

Category	Fuel	Segment	Euro Standard	Year 1	Year n
Name 1	Fuel 1	Segment 1	Standard 1	$EF1_1$	EFn_1
Name 2	Fuel 2	Segment 2	Standard 2	$EF1_2$	EFn_2
Name n	Fuel n	Segment n	Standard n	$EF1_n$	EFn_n

COPERT CLI will only calculate results for those pollutants where a valid emission factor has been provided. Only total emissions per driving share can be calculated for custom vehicle types (no distinction between hot, cold etc.). Full export is provided for all COPERT vehicle types.

Please also explain how fuel consumption can be calculated for additional vehicle types.

*Additional emission sheets can be named as follows:

Table 5 Naming of custom emission factors sheets

NEW_CO_EF	NEW_NOX_EF
NEW_VOC_EF	NEW_PM_TSP_EF
NEW_EC_EF	NEW_CH4_EF
NEW_NH3_EF	NEW_N2O_EF
NEW_NMVOC_EF	NEW_CO2_EF
NEW_SO2_EF	NEW_PB_EF
NEW_CD_EF	NEW_CU_EF
NEW_CR_EF	NEW_NI_EF
NEW_SE_EF	NEW_ZN_EF
NEW_NO_EF	NEW_NO2_EF
NEW_PM_2.5_EF	NEW_PM_10_EF
NEW_BC_EF	NEW_OM_EF
NEW_HG_EF	NEW_AS_EF

Results

The COPERT CLI will export all available results that can be found in the Windows version of the model (Figure 8). For all COPERT vehicle categories all emissions will be exported for all driving modes separately.
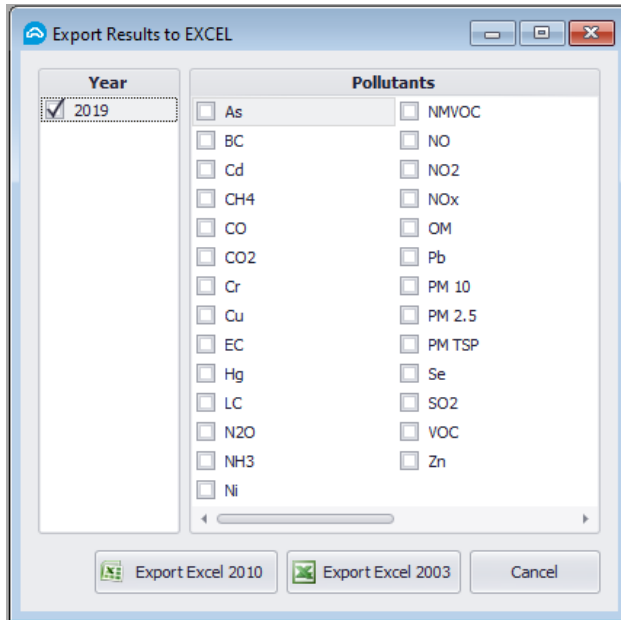
Figure 8 Available results

For the non COPERT vehicle categories emissions will be exported for all driving modes separately, but results will only be calculated for those pollutants where an emission factor has been provided by the user. For the other pollutants , the non-COPERT vehicles will be displayed in the results with blank emissions. In this way all the "..total" sheets in the results file (not the "..hot", "..cold" etc. sheets) will have the same number of rows.

Examples of the software use

Example 1: Provide a function for the user defined vehicle's speed

One of the CLI's major advantages is the ability to integrate in the same file COPERT and non-COPERT vehicle types and their respective emissions. To facilitate emission calculation the user defines an implied emission factors per drive profile (Urban Peak, Urban off peak, Rural and Highway mode) for non COPERT vehicles. Alternatively, the user can define a function for the emission factor which is speed dependent, provide custom vehicle speed in the respective sheet, and link the cells (Figure 9). In this way different scenarios can be performed by using different speeds, even for the non-COPERT vehicle types.
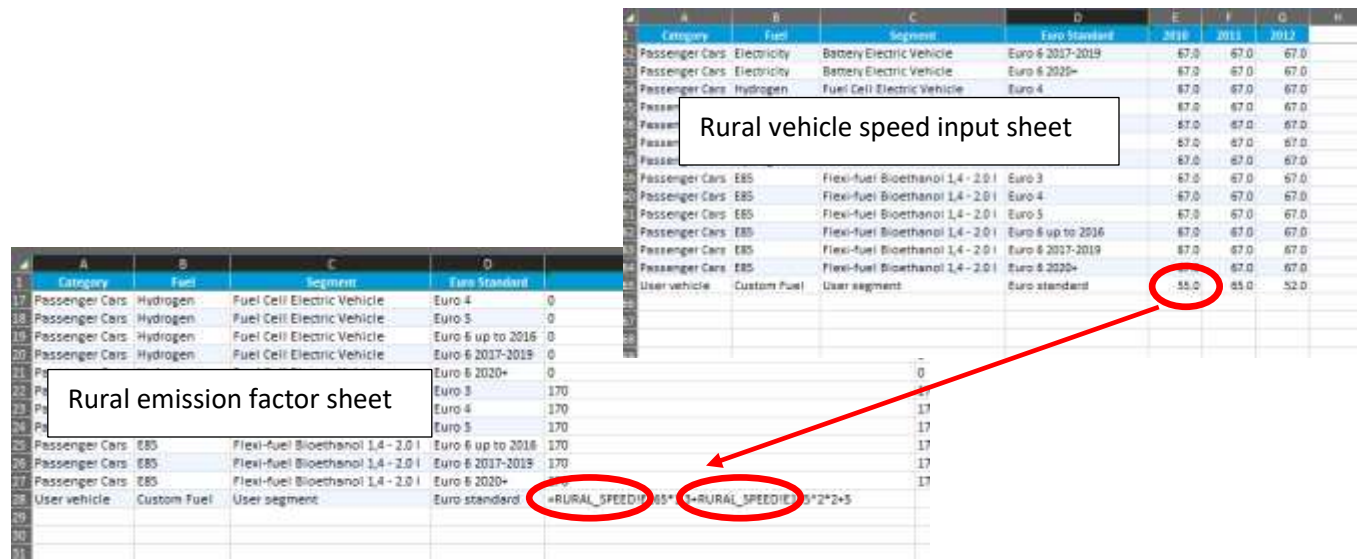
Figure 9 Speed dependent emission factors

Example 2: How to introduce multiple powertrains (or fuels) for the same vehicle

New vehicles may use more than one motor to operate. Moreover, these motors may consume different fuels provided by external sources. Moreover, it is possible that the fuel consumed may be a blend (e.g. fossil and biofuels), requiring two emission or consumption factors to simulate engine behavior. To model these vehicles the user can "split up" the vehicle according to operation and consumption modes, provide separate emission or consumption factors and calculate results for each part (Figure 10). The model will treat each individual part as a separate vehicle, allowing the user to sum the results into one vehicle type. A good example is the plug-in hybrid vehicle. The user can provide 3 vehicles to the model as in the example in Figure 10.
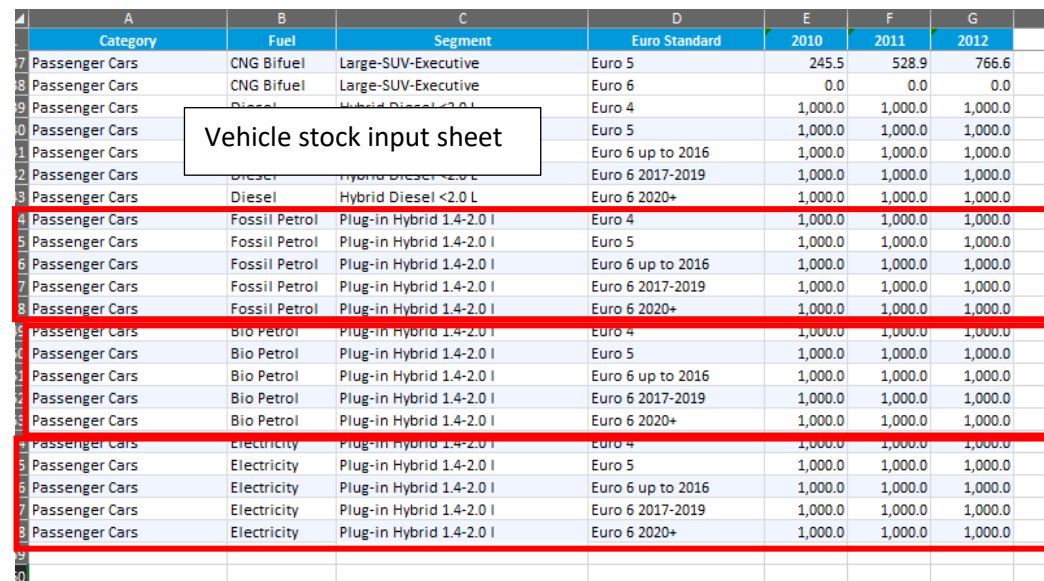
Figure 10 "Split-up" of Plug-in hybrid vehicles

To simulate the percentage, use for the different operating conditions a split to the activity will be provided. If a 30/70 split exists between electric and internal combustion engine operation and a fuel blend E10 is used, this can be approximated by splitting mean vehicle activity, e.g. 15.000 km per year, into:

30% x 15.000 km = 4.500 km of pure electric propulsion,

and the remaining 10.500 km will be further subsplit 90/10 into petrol and biofuel (Figure 11).

|	A	B	C	D	E	F	G
	Category	Fuel	Segment	Euro Standard	2010	2011	2012
6	Passenger Cars	CNG Bifuel	Large-SUV-Executive	Euro 4	15,000.0	15,000.0	15,000.0
7	Passenger Cars	CNG Bifuel	Large-SUV-Executive	Euro 5	15,000.0	15,000.0	15,000.0
8	Passenger Cars	CNG Bifuel	Large-SUV-Executive	Euro 6	15,000.0	15,000.0	15,000.0
9	Passen		2.0 L	Euro 4	15,000.0	15,000.0	15,000.0
0	Passen	Annual mileage input sheet	2.0 L	Euro 5	15,000.0	15,000.0	15,000.0
1	Passen		2.0 L	Euro 6 up to 2016	15,000.0	15,000.0	15,000.0
2	Passenger Cars	Diesel	Hybrid Diesel <2.0 L	Euro 6 2017-2019	15,000.0	15,000.0	15,000.0
3	Passenger Cars	Diesel	Hybrid Diesel <2.0 L	Euro 6 2020+	15,000.0	15,000.0	15,000.0
	Passenger Cars	Fossil Petrol	Plug-in Hybrid 1.4-2.0 l	Euro 4	9,450.0	9,450.0	9,450.0
	Passenger Cars	Fossil Petrol	Plug-in Hybrid 1.4-2.0 l	Euro 5	9,450.0	9,450.0	9,450.0
	Passenger Cars	Fossil Petrol	Plug-in Hybrid 1.4-2.0 l	Euro 6 up to 2016	9,450.0	9,450.0	9,450.0
	Passenger Cars	Fossil Petrol	Plug-in Hybrid 1.4-2.0 l	Euro 6 2017-2019	9,450.0	9,450.0	9,450.0
	Passenger Cars	Fossil Petrol	Plug-in Hybrid 1.4-2.0 l	Euro 6 2020+	9,450.0	9,450.0	9,450.0
9	Passenger Cars	Bio Petrol	Plug-in Hybrid 1.4-2.0 l	Euro 4	1,050.0	1,050.0	1,050.0
0	Passenger Cars	Bio Petrol	Plug-in Hybrid 1.4-2.0 l	Euro 5	1,050.0	1,050.0	1,050.0
1	Passenger Cars	Bio Petrol	Plug-in Hybrid 1.4-2.0 l	Euro 6 up to 2016	1,050.0	1,050.0	1,050.0
2	Passenger Cars	Bio Petrol	Plug-in Hybrid 1.4-2.0 l	Euro 6 2017-2019	1,050.0	1,050.0	1,050.0
3	Passenger Cars	Bio Petrol	Plug-in Hybrid 1.4-2.0 l	Euro 6 2020+	1,050.0	1,050.0	1,050.0
	Passenger Cars	Electricity	Plug-in Hybrid 1.4-2.0 l	Euro 4	4,500.0	4,500.0	4,500.0
	Passenger Cars	Electricity	Plug-in Hybrid 1.4-2.0 l	Euro 5	4,500.0	4,500.0	4,500.0
	Passenger Cars	Electricity	Plug-in Hybrid 1.4-2.0 l	Euro 6 up to 2016	4,500.0	4,500.0	4,500.0
	Passenger Cars	Electricity	Plug-in Hybrid 1.4-2.0 l	Euro 6 2017-2019	4,500.0	4,500.0	4,500.0
	Passenger Cars	Electricity	Plug-in Hybrid 1.4-2.0 l	Euro 6 2020+	4,500.0	4,500.0	4,500.0

Figure 11 Activity split of Plug-in hybrid vehicles (Mean Activity Sheet)

Separate emission or energy consumption factors must be provided by the user for each fuel type. Energy consumption factors are treated in COPERT the same way as emission factors. COPERT will calculate emissions and consumption for all vehicles. The user can at a later stage sum up results in a single row.

Example 3: Provide own emission factors for COPERT vehicle types

It is not possible to provide own emission factor for COPERT vehicle types using the CLI functionality. However, there is a workaround if the user wishes to do so. The user can define a custom vehicle along with the respective input data (stock, activity, custom emission factors etc) with a description matching almost exactly the description of the COPERT vehicle (Figure 12). This way the input information will not be used in the COPERT algorithm but will be treated as a non-COPERT vehicle, allowing for the custom emission factors to be used.

	Category	Fuel	Segment	Euro Standard	2010	2011	2012
1	Category	Fuel	Segment	Euro Standard	2010	2011	2012
2	Passenger Cars	Petrol	Mini	Euro 4	0.0	0.0	0.0
3	Passenger Cars	Petrol	Mini	Euro 5	0.0	0.0	0.0
4	Passenger Cars	Petrol	Mini	Euro 6 up to 2016	0.0	0.0	0.0
5	Passenger Cars	Petrol	Mini	Euro 6 2017-2019	0.0	0.0	0.0
6	Passenger Cars	Petrol	Mini	Euro 6 2020+	0.0	0.0	0.0
7	Pass			PRE ECE	0.0	0.0	0.0
8	Pass			ECE 15/00-01	0.0	0.0	0.0
9	Passenger Cars	Petrol	Small	ECE 15/02	0.0	0.0	0.0
10	Passenger Cars	Petrol	Small	ECE 15/03	14,910.5	10,313.4	7,065.8
62	.....	.....	.....	.....	.....	.....	.....
63	Passenger Cars	E85	Flexi-fuel Bioethanol 1,4 - 2.0 l	Euro 6 up to 2016	1,000.0	1,000.0	1,000.0
64	Passenger Cars	E85	Flexi-fuel Bioethanol 1,4 - 2.0 l	Euro 6 2017-2019	1,000.0	1,000.0	1,000.0
65	Passenger Cars	E85	Flexi-fuel Bioethanol 1,4 - 2.0 l	Euro 6 2020+	1,000.0	1,000.0	1,000.0
66	Passenger Cars	Petrol	Mini - custom	Euro 6 up to 2016	1,000.0	1,000.0	1,000.0
67							
68							
69							
70							

User provided emission factors

Figure 12 Provide own emission factor for COPERT vehicle types

Glossary

List of abbreviations

COPERT	Computer programme to calculate emissions from road transport
CLI	Command Line Interface
xlsx	Microsoft Excel filetype
json	JavaScript Object Notation filetype

ANNEX

Country name	abbreviation
Afghanistan	AF
Åland Islands	AX
Albania	AL
Algeria	DZ
American Samoa	AS
Andorra	AD
Angola	AO
Anguilla	AI
Antarctica	AQ
Antigua and Barbuda	AG
Argentina	AR
Armenia	AM
Aruba	AW
Australia	AU
Austria	AT
Azerbaijan	AZ
Bahrain	BH
Bahamas	BS
Bangladesh	BD
Barbados	BB
Belarus	BY
Belgium	BE
Belize	BZ
Benin	BJ
Bermuda	BM
Bhutan	BT
Bolivia	BO
Bonaire, Sint Eustatius and Saba	BQ
Bosnia and Herzegovina	BA
Botswana	BW
Bouvet Island	BV
Brazil	BR
British Indian Ocean Territory	IO
Brunei Darussalam	BN
Bulgaria	BG
Burkina Faso	BF
Burundi	BI
Cambodia	KH
Cameroon	CM
Canada	CA
Cape Verde	CV
Cayman Islands	KY
Central African Republic	CF
Chad	TD
Chile	CL
China	CN

Christmas Island	CX
Cocos (Keeling) Islands	CC
Colombia	CO
Comoros	KM
Congo	CG
Congo, Democratic Republic of	CD
Cook Islands	CK
Costa Rica	CR
Côte d'Ivoire	CI
Croatia	HR
Cuba	CU
Curaçao	CW
Cyprus	CY
Czech Republic	CZ
Denmark	DK
Djibouti	DJ
Dominica	DM
Dominican Republic	DO
Ecuador	EC
Egypt	EG
El Salvador	SV
Equatorial Guinea	GQ
Eritrea	ER
Estonia	EE
Ethiopia	ET
Falkland Islands (Malvinas)	FK
Faroe Islands	FO
Fiji	FJ
Finland	FI
France	FR
French Guiana	GF
French Polynesia	PF
French Southern Territories	TF
Gabon	GA
Gambia	GM
Georgia	GE
Germany	DE
Ghana	GH
Gibraltar	GI
Greece	GR
Greenland	GL
Grenada	GD
Guadeloupe	GP
Guam	GU
Guatemala	GT
Guernsey	GG
Guinea	GN
Guinea-Bissau	GW
Guyana	GY

Haiti	HT
Heard Island and McDonald Islands	HM
Vatican City	VA
Honduras	HN
Hong Kong	HK
Hungary	HU
Iceland	IS
India	IN
Indonesia	ID
Iran	IR
Iraq	IQ
Ireland	IE
Isle of Man	IM
Israel	IL
Italy	IT
Jamaica	JM
Japan	JP
Jersey	JE
Jordan	JO
Kazakhstan	KZ
Kenya	KE
Kiribati	KI
Korea, North	KP
Korea, South	KR
Kuwait	KW
Kyrgyzstan	KG
Laos	LA
Latvia	LV
Lebanon	LB
Lesotho	LS
Liberia	LR
Libya	LY
Liechtenstein	LI
Lithuania	LT
Luxembourg	LU
Macao	MO
North Macedonia	MK
Madagascar	MG
Malawi	MW
Malaysia	MY
Maldives	MV
Mali	ML
Malta	MT
Marshall Islands	MH
Martinique	MQ
Mauritania	MR
Mauritius	MU
Mayotte	YT
Mexico	MX

Micronesia	FM
Moldova	MD
Monaco	MC
Mongolia	MN
Montenegro	ME
Montserrat	MS
Morocco	MA
Mozambique	MZ
Myanmar	MM
Namibia	NA
Nauru	NR
Nepal	NP
Netherlands	NL
New Caledonia	NC
New Zealand	NZ
Nicaragua	NI
Niger	NE
Nigeria	NG
Niue	NU
Norfolk Island	NF
Northern Mariana Islands	MP
Norway	NO
Oman	OM
Pakistan	PK
Palau	PW
Palestine, State of	PS
Panama	PA
Papua New Guinea	PG
Paraguay	PY
Peru	PE
Philippines	PH
Pitcairn	PN
Poland	PL
Portugal	PT
Puerto Rico	PR
Qatar	QA
Réunion	RE
Romania	RO
Russian Federation	RU
Rwanda	RW
Saint Barthélemy	BL
Saint Helena, Ascension and Tristan da Cunha	SH
Saint Kitts and Nevis	KN
Saint Lucia	LC
Saint Martin (French part)	MF
Saint Pierre and Miquelon	PM
Saint Vincent and the Grenadines	VC
Samoa	WS
San Marino	SM

Sao Tome and Principe	ST
Saudi Arabia	SA
Senegal	SN
Serbia	RS
Seychelles	SC
Sierra Leone	SL
Singapore	SG
Sint Maarten (Dutch part)	SX
Slovakia	SK
Slovenia	SI
Solomon Islands	SB
Somalia	SO
South Africa	ZA
South Georgia and the South Sandwich Islands	GS
South Sudan	SS
Spain	ES
Sri Lanka	LK
Sudan	SD
Suriname	SR
Svalbard and Jan Mayen	SJ
Swaziland	SZ
Sweden	SE
Switzerland	CH
Syria	SY
Taiwan, Province of China	TW
Tajikistan	TJ
Tanzania	TZ
Thailand	TH
Timor-Leste	TL
Togo	TG
Tokelau	TK
Tonga	TO
Trinidad and Tobago	TT
Tunisia	TN
Turkey	TR
Turkmenistan	TM
Turks and Caicos Islands	TC
Tuvalu	TV
Uganda	UG
Ukraine	UA
United Arab Emirates	AE
United Kingdom	GB
United States	US
United States Minor Outlying Islands	UM
Uruguay	UY
Uzbekistan	UZ
Vanuatu	VU
Venezuela	VE
Vietnam	VN

Virgin Islands, British	VG
Virgin Islands, U.S.	VI
Wallis and Futuna	WF
Western Sahara	EH
Yemen	YE
Zambia	ZM
Zimbabwe	ZW
Burma (Myanmar)	AA
EU28	EU28