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MISSION FOR ENVIRONMENT

copert 5

COMPUTER PROGRAMME TO CALCULATE EMISSIONS FROM ROAD TRANSPORT

ERMES PLENARY, Zurich, 2017-11-14

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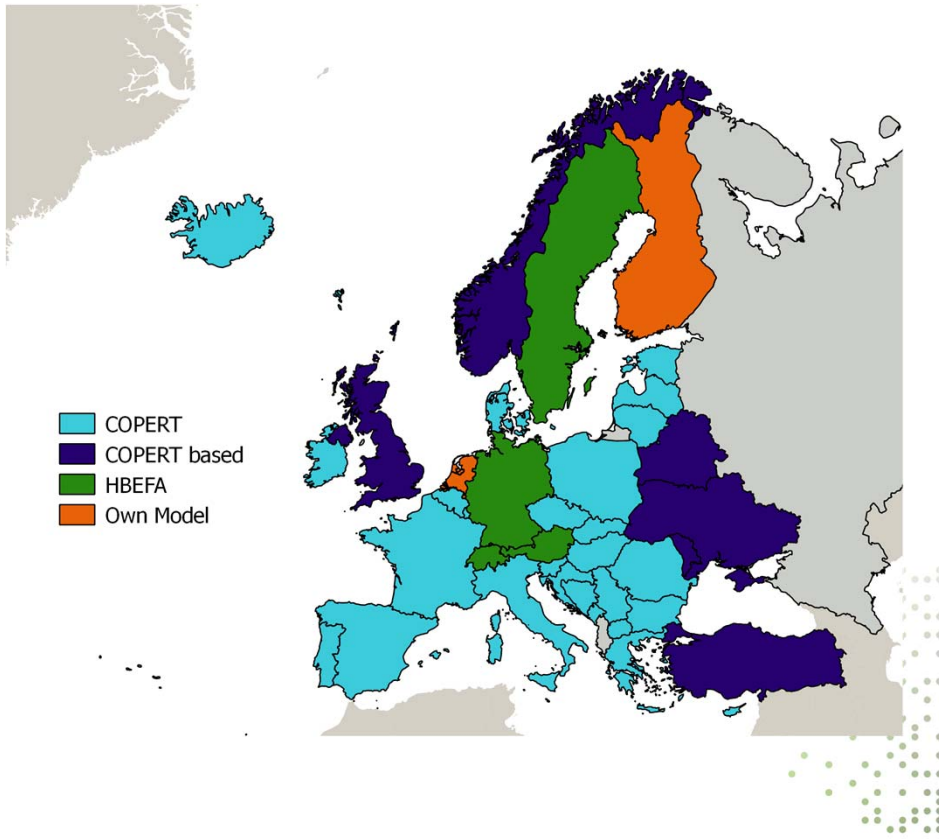
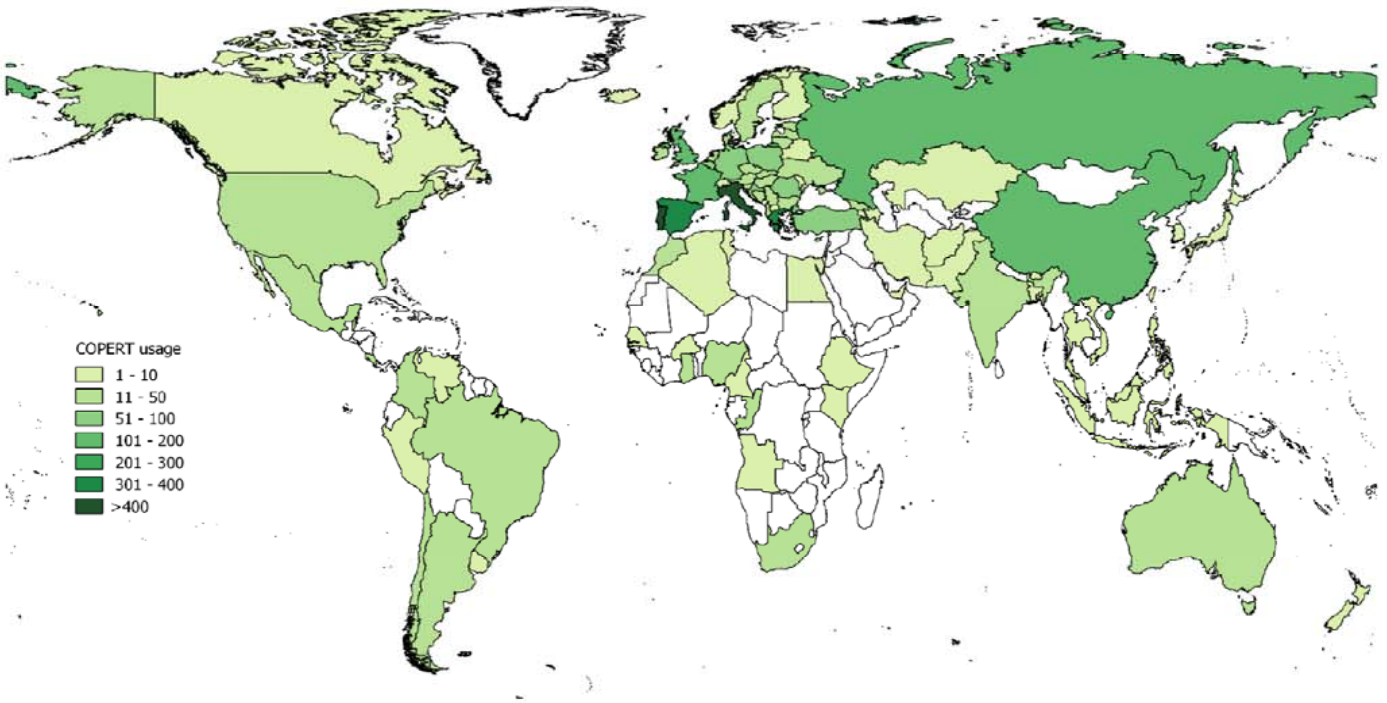
Background

- COPERT 5.0 (May 2017) is the fifth update of the original COPERT 85 and substitutes previous versions
- Development and users supported by the European Environmental Agency through renewed ETC budgets
- Its methodology comprises the road transport chapters in the EMEP/EEA Air Emissions Inventory Guidebook
- Owned and maintained by EMISIA and technical developments discussed in ERMES and TFEIP groups



COPERT downloads around the world



Statistics from 05/11 to 10/17

~800 downloads per year

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European Environment Agency
European Topic Centre on Air Pollution and Climate Change Mitigation

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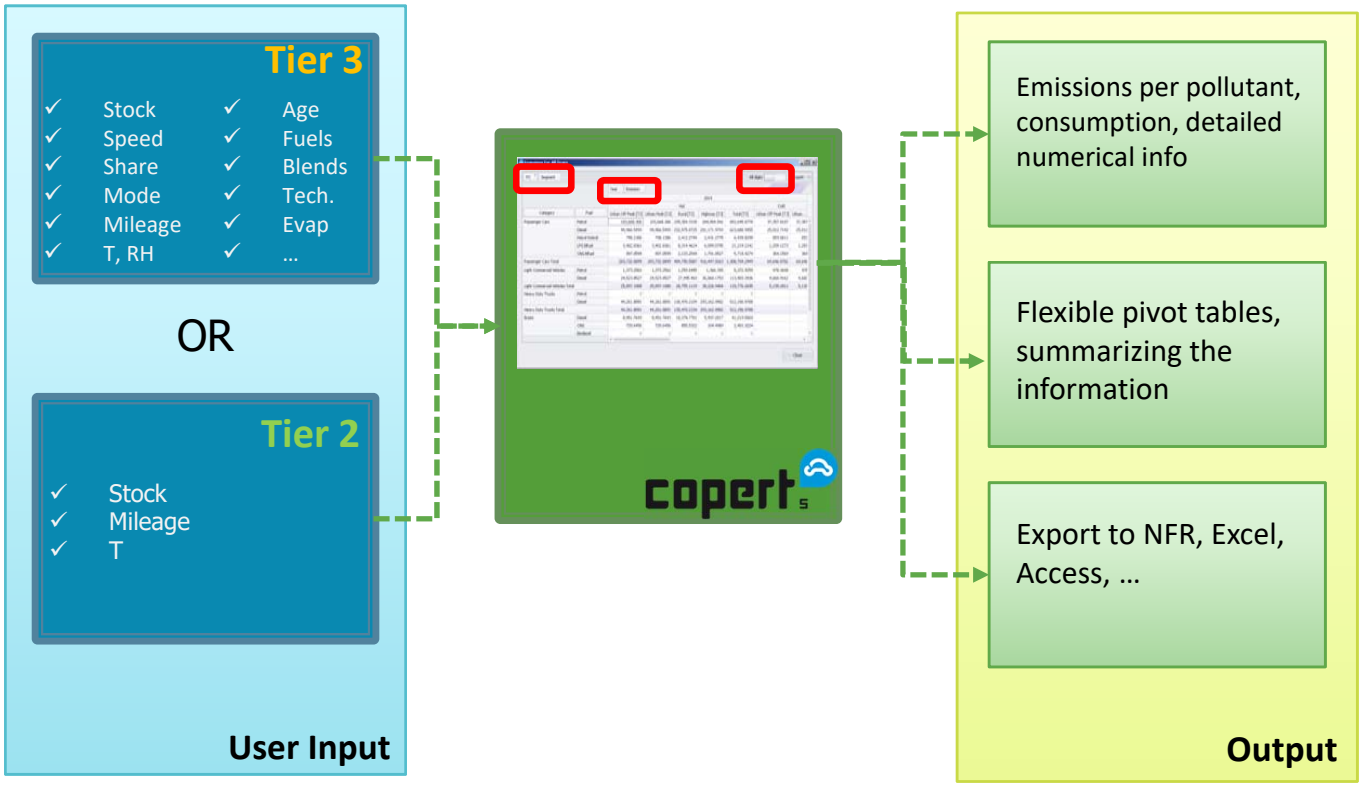
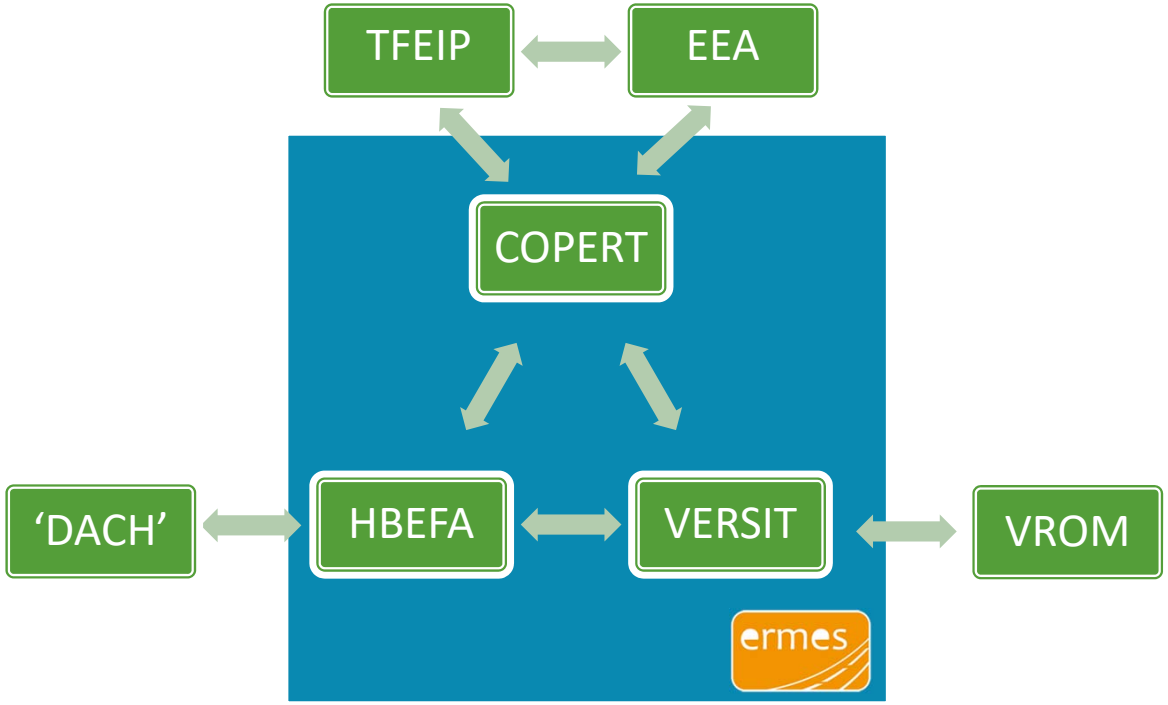
What COPERT 5 does



COPERT 5 Development Process



Upcoming Dec. 2016 version

- CO_2 correction per PC Model Year following latest ICCT correction factors
- New 'entities' mode to separately calculate emissions in regions and sum up together under same fuel consumption (e.g. 3 Belgian regions)
- Fuel consumption factors in MJ/km to accommodate different blends
- CO_2 emissions from SCR added
- Bug Fixes
  - Bugs identified in CH_4, NH_3 and CO_2 correction fixed
  - Negtive NMVOX for CNG cars
  - NO_2/NO_x for late vehicle technologies
  - …

Diesel LDV NOx

- COPERT Diesel PC NOx patch-corrected (fast and dirty approach) in May 2016 to include ‘corrected’ Euro 6 for 2016 inventory submission
- Major Revisions (More Info: Ntziachristos et al. Atm Env. 141, 2016)
  - **Euro 6<2016**: Euro 6a-c mean level where available PEMS measurements showed (~0.46 g/km)
  - **Euro 6 2017-2019**: Co-existence of Euro 6c (0.46 g/km) with Euro 6d-temp (CF: 2.1 = 0.176 g/km), hence average at ~0.35 g/km
  - **Euro 6 2020+**: RDE + ‘non RDE’ conditions, currently mean at 0.17 g/km
  - **LCVs:** Emission factors differentiated with vehicle size and substantially increased
- Plan announced in 2016
  - Further revise if ERMES comes with significantly different levels in 2017
  - But, often revisions confusing and troublesome for inventorying and projections

Where do we stand at the moment?

Category	Technology	COPERT 5 May 2016	HBEFA 3.3 Apr 2017	VERSIT+ Nov. 2017	Comment
PC	Euro 5	0.647	0.846	0.600	
	Euro 6 pre 2017	0.533	0.470	0.391	
	Euro 2017-2019	0.407	0.346*		*In H3.3 assuming 60/40 6c/6d-temp
	Euro 6d (2020+)	0.198	0.108	0.194	
LCV N1-III	Euro 5	1.319		1.460	
	Euro 6 pre 2018	1.066		0.365	
	Euro 2018-2020	0.555			
	Euro 6d (2021+)	0.272		0.283	

All values in g/km. Example shown for London (T=12°C) and typical travelling parameters (UP/UOP/R/H): 15/25/40/20%, 12/35/60/90 km/h

- Generally consistent, with individual differences
- HBEFA Euro 5 increased due to latest T correction
- Future EFs show variable degree of optimism…

No immediate need to change COPERT EFs

- Where will Euro 6d be?
  - CF = 1.5 and may still drop and well-engineered diesel cars have potential to go much below the limit
  - Current RDE procedure useful for EF production but RDE TA not an EF!:
    - Processed result not same as average level (EMROAD, CLEAR)
    - RDE driving conditions maybe unsuitable for LDVs (stop and go conditions for urban delivery – cold SCR).
    - LDVs real load may substantially differ from RDE test load
    - RDE is valid from 0-30 deg C, potentially significant driving share outside these conditions. **High T equally risky to low T.**
    - Manufactures now fight for further flexibilities (aka 'transfer function')
    - Effect of malfunctions, degradation, non compliance, etc?
- Don't forget about a possible Euro 7!

Thank you for the attention!