copert

Status and new features
Some facts on COPERT

- COPERT is globally the most well recognized software for road traffic emission calculation with applications in all five continents
  - Customised versions such as the ‘COPERT Australia’ being developed. This is the official method in the National Pollutants Inventory guidebook of Australia

- It is continuously supported by the European Environment Agency through various European Topic Centre frameworks
  - It makes up the template Tier 3 methodology for road transport in the AEIG

- The Joint Research Centre / Institute for Energy also supports the technical development, mostly through maintaining the European Research on Mobile Emission Sources group (www.ermes-group.eu)

- It is technically maintained and further developed by EMISIA SA with input and technical advice from the Laboratory of Applied Thermodynamics
**Background**

- COPERT 4 has been active since 2006 through many (mostly annual) revisions
  - Currently version 11.2!
- Difficult to handle and maintain owed to the many ad hoc methodological revisions since original version
- Slow and cumbersome for users (like national experts) who require time series calculations
- Improve flexibility required to apply air-pollutants and GHG methods to new and future vehicles and fuel types
Need for COPERT 5

COPERT 5 has been discussed since a few years now
- First in TFEIP 2012 (Bern, CH)
- Dedicated discussion in Nov 2012 (EEA, Copenhagen, DK) to put priorities
- Scoping document drafted in March 2013 to summarise development path

Renewed interest from national experts expressed late 2014
- Main problem is handling of long time series

Decision taken by EEA and funding approved within ETC 2015 and 2016 budgets!
Technical Specifications

- Windows XP SP2, Vista, 7, 8, 10
- VB .NET Framework 4.0
  - COPERT 4 => VB .NET 2003
- Microsoft SQL Compact Edition 4.0 database (*.sdf)
  - COPERT 4 => MS ACCESS 2000-2003 (*.mdb)
- Devexpress v.14 Framework for form designing, results and charting
  - COPERT 4 => Microsoft Crystal Reports 2003
Software improvements

- 10x faster calculations for each year
- 40+ years time series
- Smaller file size when saving
- Better run details and changes monitoring
New Features (1/2)

- Dynamic charts for all results
  - Emission factors
  - Final emissions

- Copy a year full dataset to another year

- Import - export all datasets to all known file formats:
  [*.xls | *.xlsx | *.mdb | *.csv | *.xml | *.json]
  - Input data
  - Calculation parameters
  - Emission factors
  - Final emissions
  - Advanced characteristics
New Features (2/2)

- Undo & redo functionality to all forms
- Functional progress bars for all time consuming processes
- Ability to cancel all time consuming processes
- Up to date help file, online & locally
- Live update to new versions
Links to other software

- SIBYL v4.0
  - Import
  - Export

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Key methodology updates (1/2)

- Improved fuels handling
  - Possibilities for blending
  - New fuels and fuel blending components (H₂, ELE, HVO, ETBE, ButOH)
  - Automation of energy balance – first execute this, then run air pollutants

- Improved GHG calculation
  - Incorporation of gCO₂/MJ emission factors
  - Transparent calculation of biomass CO₂ and other GHGs

- Incorporation of two modelling scales
  - Tier 2: Simplified emission factors
  - Tier 3: Detailed emission factors and methodology
Key methodology updates (2/2)

- Extended list of vehicle types
  - Electrified vehicles
  - H$_2$ Fuel Cell
  - Bifuel vehicles (LPG/Petrol, CNG/Petrol)
  - Flex-fuel vehicles (EX)

- Distinguish urban speed to peak and off-peak
  - User to select whether this option is used

- Users’ requirements
  - Include road attrition
  - Estimate TSP emissions
Planning

- No new COPERT 4 version this year – currently 11.2 version to remain until summer 2016
- First COPERT 5 version to be launched September 2016
Some more news

- COPERT Street Level Beta Version available on EMISIA’s website for evaluation
  - Calculates (for now) not only emissions on a street network (link-by-link) level
  - Can be combined with all known meso and macro scale traffic modes (VISUM, Aimsun, Sumo, ...)
  - Can be used for city development plans, environmental zones assessment, input to air quality models, carbon footprint calculation, etc.

- SIBYL V4.0 available
  - Fleet, activity, energy, GHG and air pollutants projection software for road transport
  - Graphically creates scenarios (1995-2050):
    - Technology uptake
    - Fleet replacement
    - Fuel pathways
More ideas / wishes for COPERT 5?