Willkommen
Welcome
Bienvenue

New passenger transport data

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Overview

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- The ecoinvent v2.2 passenger car
- Modularity, parametrisation and new data
- The glider and the ICE drivetrain
- The electric drivetrain
- The emissions model
- Overview of the new passenger cars transport datasets
- Conclusions

The v2.2 passenger car transport dataset

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1pkm transport, passenger car

Vehicle: Golf A4 Type

Dataset: List of overall materials, efforts and emissions for production.

Electric Vehicles: extra modules for e-motor and battery.

Operation

Dataset:
-Energy carrier input (fuel/ electricity consumption)

-List of exhaust emissions (ICEs) and non-exhaust emissions (ICEs, EVs)

Describes a specific vehicle, with fixed consumption and emissions

Modularity, parametrisation and new data in ecoinvent v3

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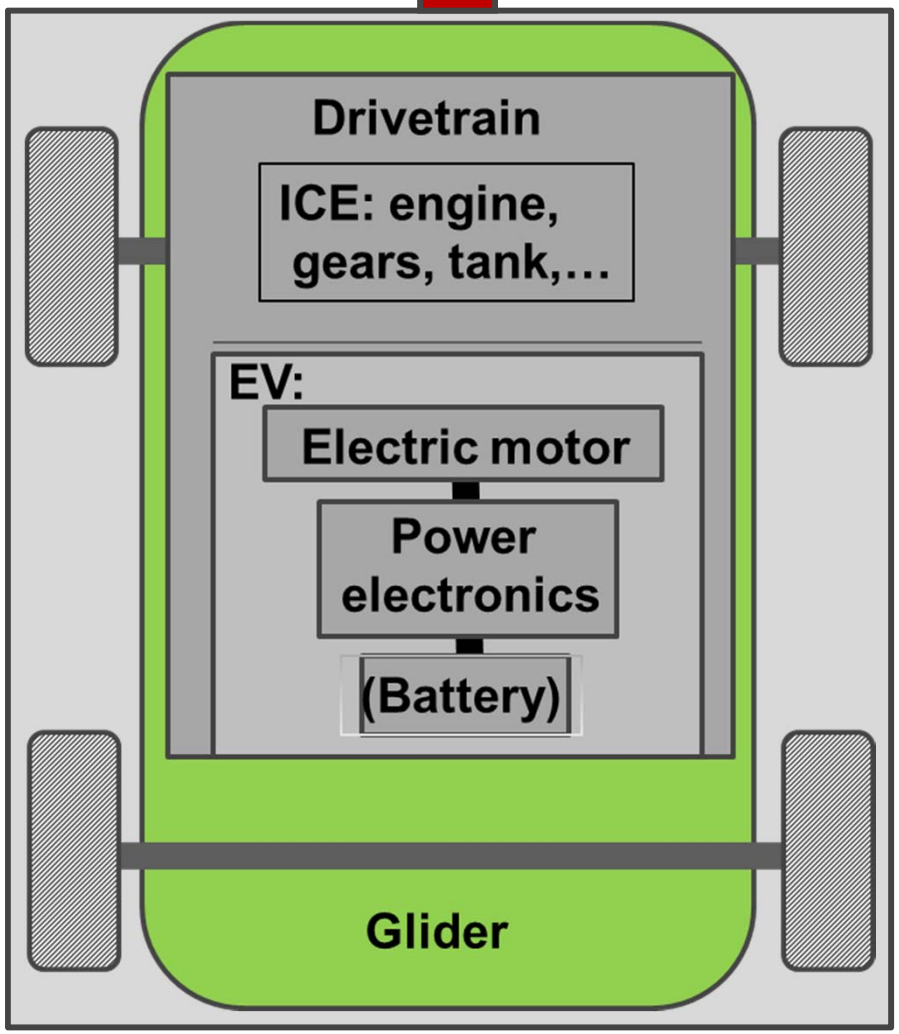
1km transport, passenger car

Vehicle



Non-exhaust emissions
(tyre, brake and road wear)

Exhaust emissions

Energy carrier
(consumption)

All modules in «kg» - Recovery of new and old scrap included.

The glider and ICE drivetrain

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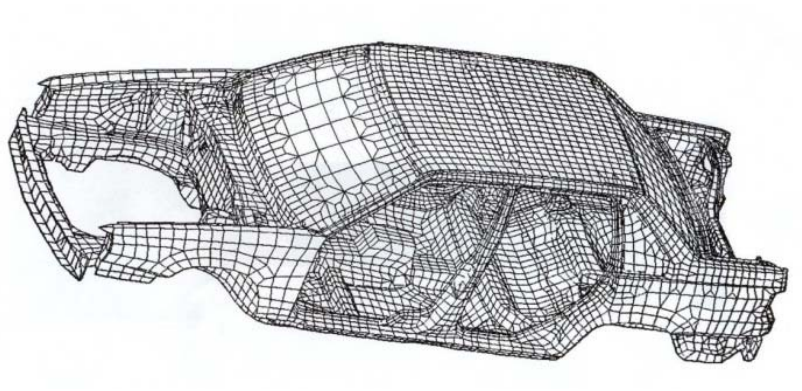
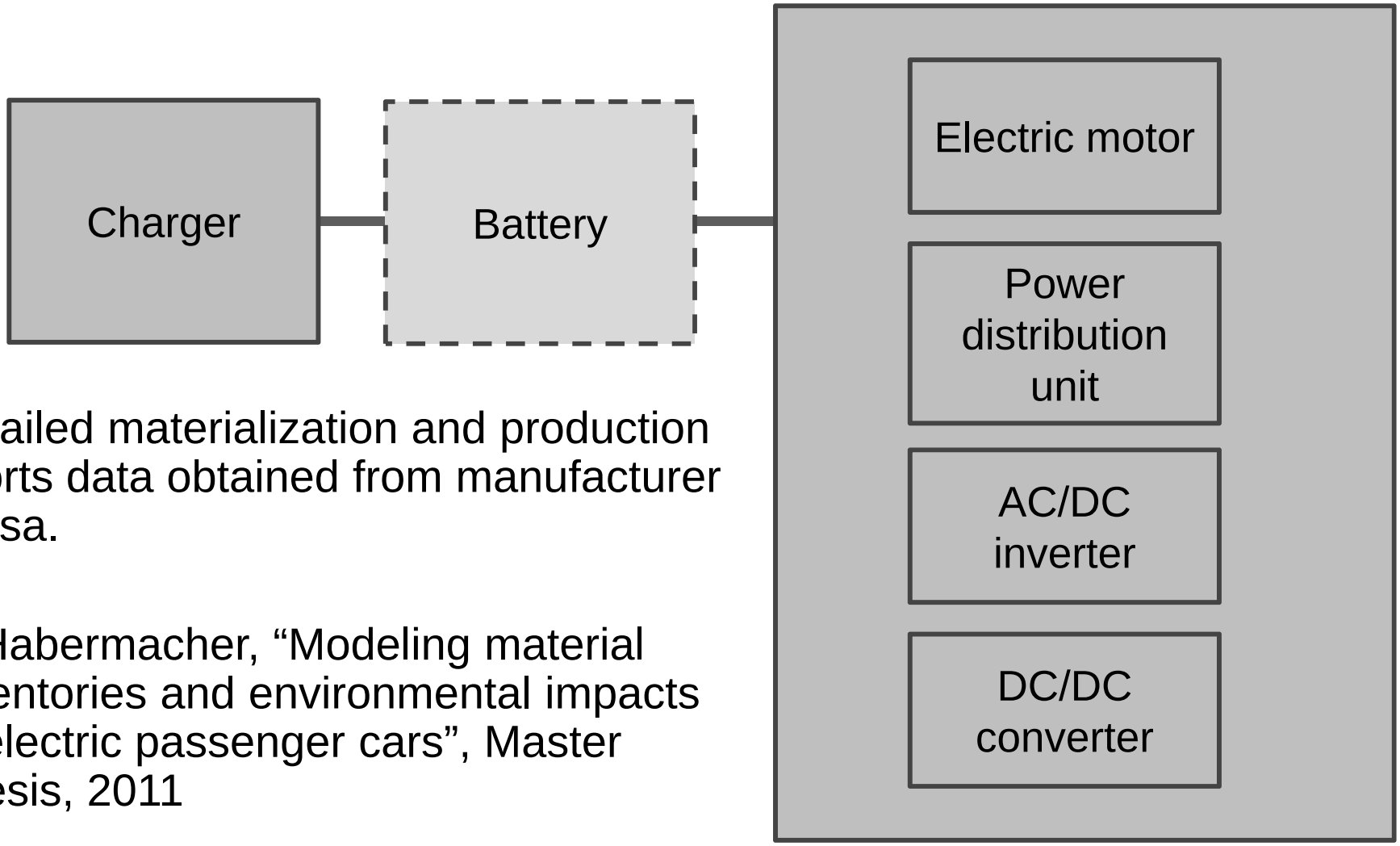


- Materialization based on literature analysis (2000-2010)
- Optimized for compact passenger car (Golf Type).
- Production efforts and emissions derived from v2.2 passenger car.
- F. Habermacher, “Modeling material inventories and environmental impacts of electric passenger cars”, Master Thesis, 2011

- Extrapolated from Schweimer and Levin “Life Cycle Inventory for the Golf A4” (2000).
- Production efforts and emissions derived from v2.2 passenger car.

The electric drivetrain



- Detailed materialization and production efforts data obtained from manufacturer Brusa.
- F. Habermacher, “Modeling material inventories and environmental impacts of electric passenger cars”, Master Thesis, 2011

Emissions datasets

- Exhaust and non-exhaust emissions now highly differentiated which allows

  - higher transparency
  - flexibility
  - easier analysis of LCIA results

- Non-exhaust emission datasets are now considered as treatments
- Exhaust emissions parameterised within the transport datasets
- Mathematical relations to derive emissions per vkm

Exhaust emissions		**Non-exhaust emissions**				
Fuel dependent	**Euro dependent**	**Fuel dependent**	**Non fuel dependent**			
Petrol emissions	3 (old)	Petrol evaporation	Tyre wear	Brake wear	Road wear	
	4 (current)					
	5 (modern)					
Diesel emissions	3 (old)	na				
	4 (current)					
	5 (modern)					
Nat gas emissions	3 (old)	na				
	4 (current)					
	5 (modern)					
3	9	1	1	1	1	Total **16**

Exhaust emissions

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- For petrol, diesel and natural gas fuels
- Data based on the Tremove model and the Emissions Inventory Guidebook (both 2009)
- Goal of consistency and relativity across vehicle sizes and Euro classes.
- Datasets for natural gas vehicles expanded to be “Euro conform” although norm values do not exist for them
- Emissions are either:
  - Fuel dependent: CO_2, SO_2, HMs, N_2O, NH_3, PAHs or
  - Euro dependent: CO, NO_x, PM, VOCs (HCs). VOCs subdivided into CH_4 and NMVOC split

Non-exhaust emissions

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- For tyre, brake and road wear, also petrol evaporation. Emissions from air conditioning still to come.
- Data based on the Emissions Inventory Guidebook (2009)
- Emissions profile expanded based on source data and increased substances in v3
- Extrapolated to different vehicle sizes
- Critical corrections made.

Example of changes v2.2 to v3: Petrol car operation

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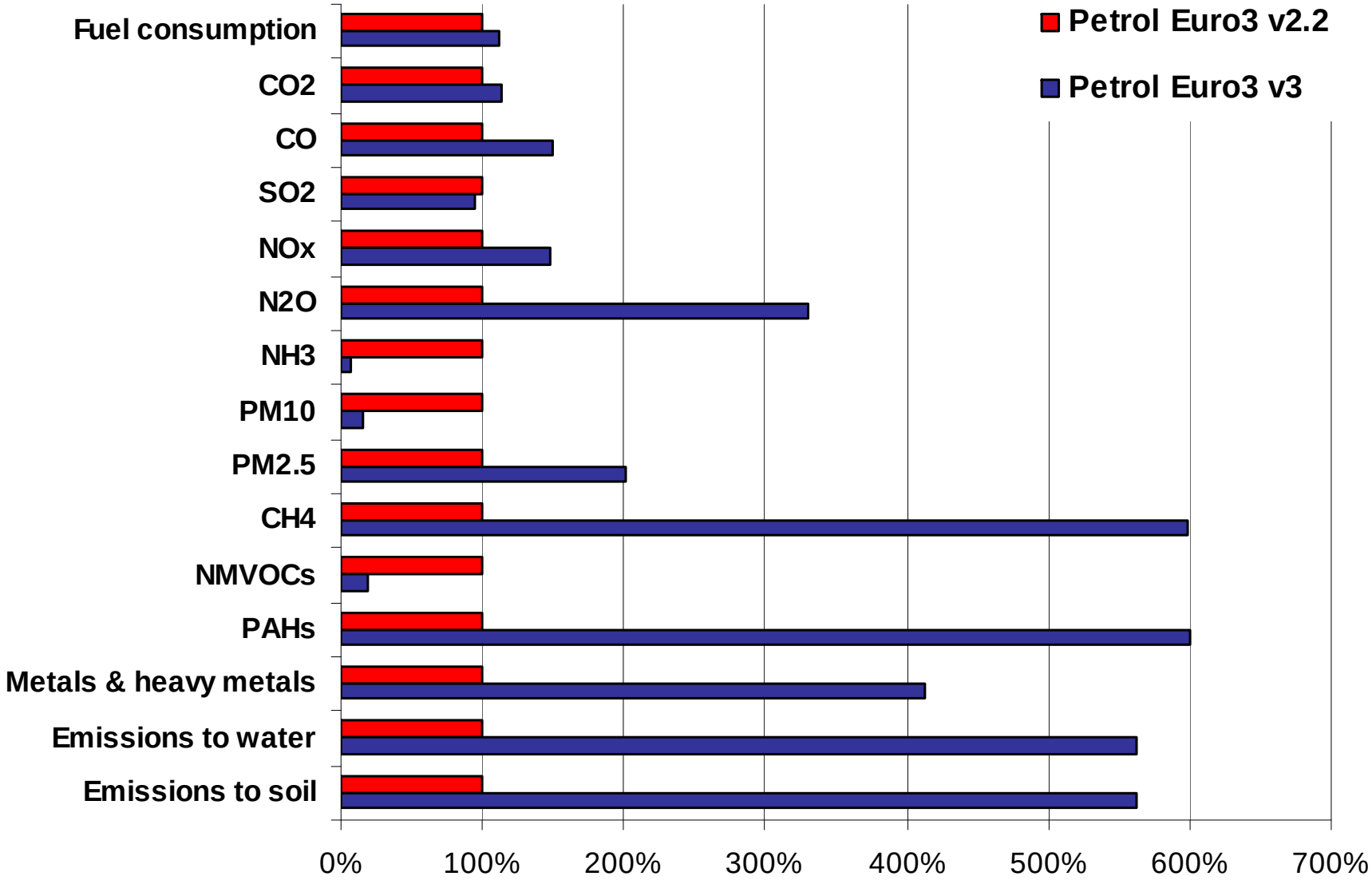
Exhaust & non-exhaust emissions



Changes in individual emissions

Overview of the new transport datasets

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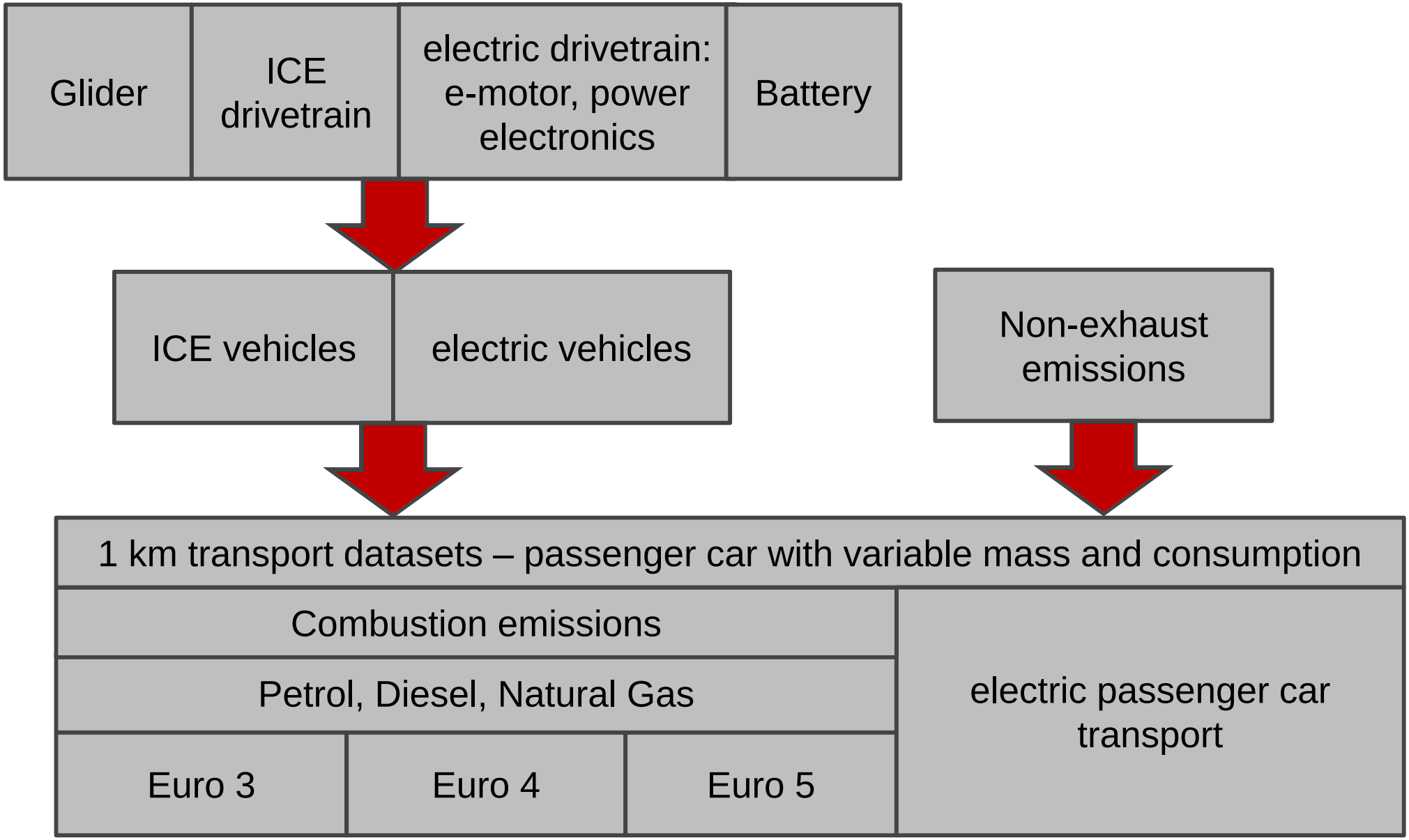

Conclusions

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- Modularity and parametrisation have been used to produce flexible datasets which are suitable for a range a vehicles masses and consumptions.
- New datasets have been developed for:
  - Glider
  - ICE and electric drivetrain
  - exhaust and non-exhaust emissions
- The available modules can be used to “build” other vehicle types (e.g. hybrid vehicles)

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Thank you very much for your attention!

http://www.thelma-emobility.net/index.html