

Guidebook and COPERT v5.7 updates

Chapters 1.A.3.b/ Road Transport



New elements in 2023

- Updated emission factors of Euro 6 CNG passenger cars
- Updated emission factors of Euro VI diesel & diesel hybrid buses
- Updated emission factors of non-exhaust emission factors
- Alternative HDVs classification based on REG EU 2017/2400
- Bug corrections in COPERTv5.7
- Planned updates for next year



COPERT v5.7 vs v5.6.5



COPERT v5.7 vs v5.6.5

Estimated % change in V5.7
with same activity per vehicle

| Pollutant | Difference |
|-----------|------------|
| As | -1.1% |
| BC | -0.2% |
| Cd | -1.2% |
| CH4 | -1.0% |
| CO | -0.1% |
| CO2 | 0.1% |
| Cr | -1.1% |
| Cu | -1.1% |
| EC | 0.1% |
| Hg | 0.2% |
| N2O | 8.8% |
| NH3 | 0.0% |
| Ni | -1.1% |
| NMVOC | -0.1% |
| NO | 0.6% |
| NO2 | 0.6% |
| NOx | 0.6% |
| OM | 0.0% |
| Pb | -1.1% |
| PM 10 | -0.4% |
| PM 2.5 | -0.3% |
| PM TSP | -0.4% |
| Se | -1.4% |
| SO2 | NaN |
| SPN23 | 0.0% |
| VOC | -0.2% |
| Zn | -1.4% |

Estimated % change in V5.7
change in total fleet

| Pollutant | Difference |
|-----------|------------|
| As | -1.4% |
| BC | -0.2% |
| Cd | -0.5% |
| CH4 | -0.1% |
| CO | 0.6% |
| CO2 | 0.1% |
| Cr | -1.3% |
| Cu | -1.3% |
| EC | 0.1% |
| Hg | 0.1% |
| LC | 0.0% |
| N2O | 0.6% |
| NH3 | 0.0% |
| Ni | -0.7% |
| NMVOC | 0.5% |
| NO | 0.5% |
| NO2 | 0.2% |
| NOx | 0.4% |
| OM | -0.0% |
| Pb | -1.5% |
| PM 10 | -0.2% |
| PM 2.5 | -0.1% |
| PM TSP | 0.1% |
| Se | -0.7% |
| SO2 | 0.1% |
| SPN23 | 0.0% |
| VOC | 0.5% |
| Zn | -1.1% |



Revision of Euro 6 CNG passenger cars



Vehicle measurements

- Vehicles

Categories:

2 passenger cars (Euro 6d-temp)

Euro Standards:

Euro 6d-temp

Engine size:

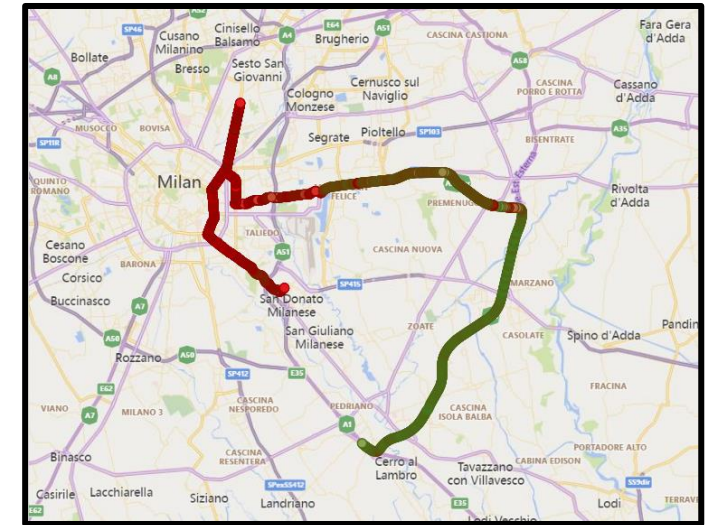
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- Measurements

Laboratory and On-road cycles
(conducted by Innovhub in Italy)

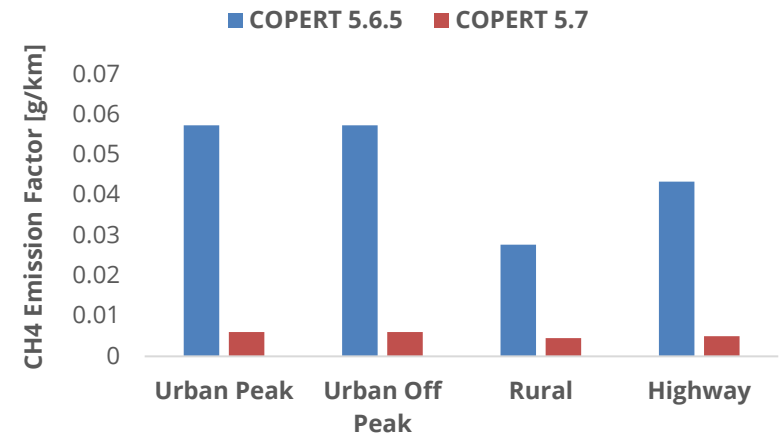
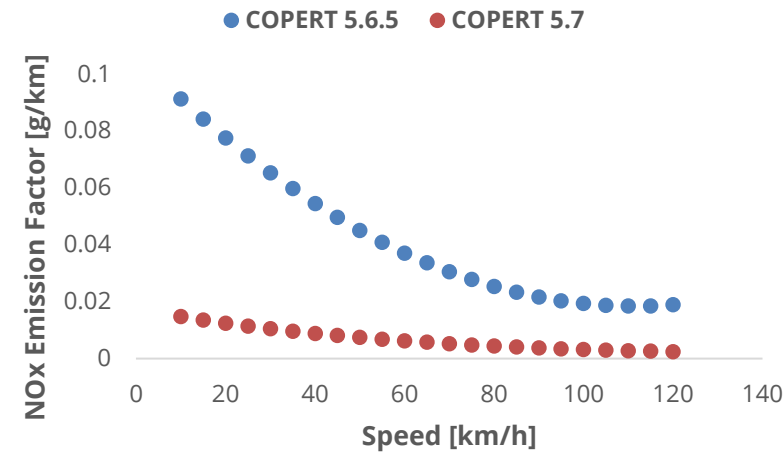
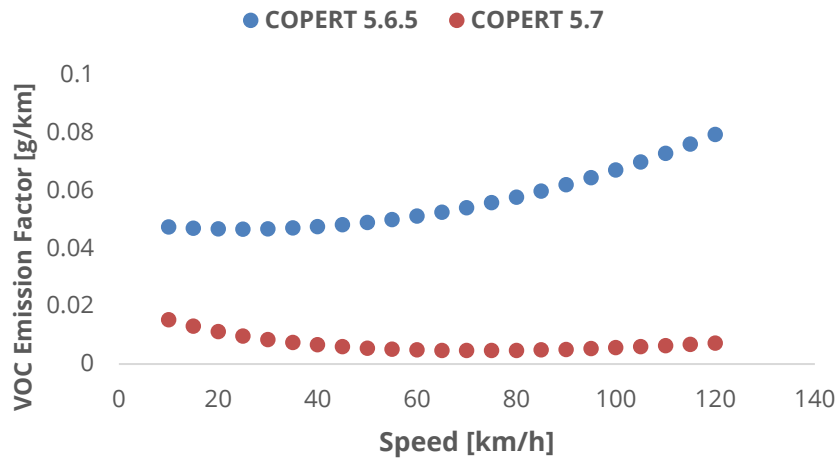
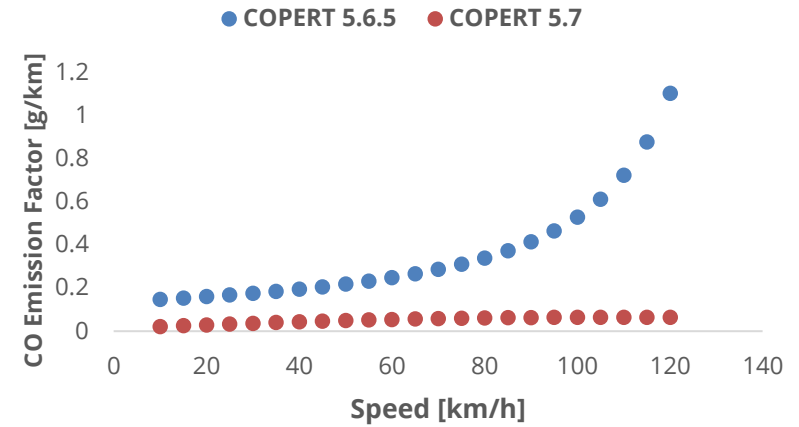
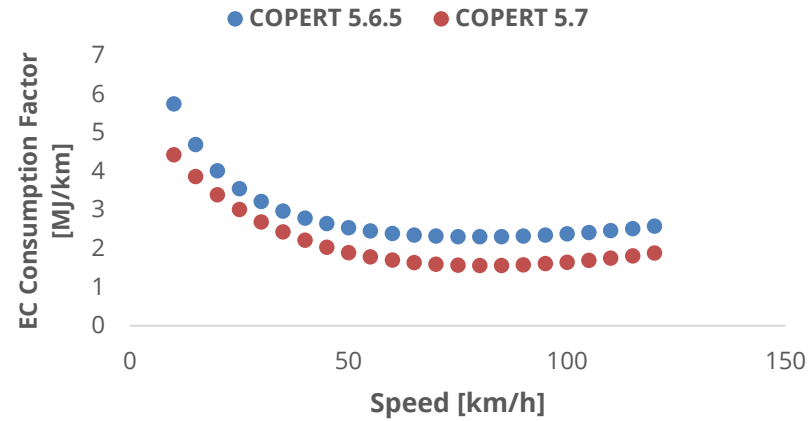
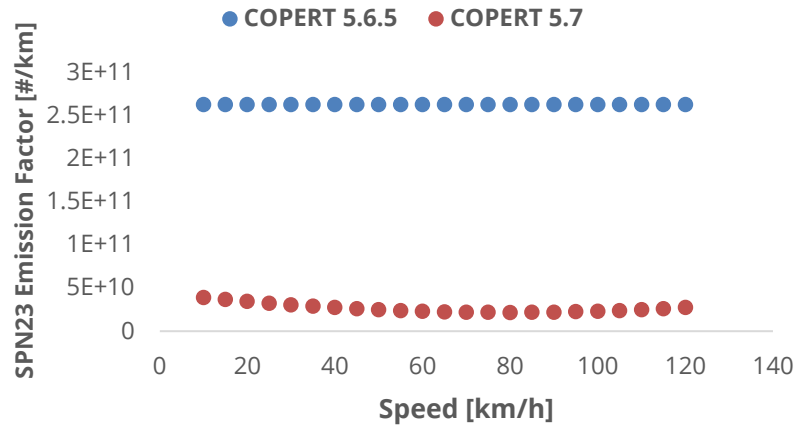
- Pollutants measured

NO_x, CO, VOC, SPN₂₃, CH₄ & EC



RDE cycle in Milan (Low speed – High Speed)

Revised equations



Conclusions

Euro 6d-temp CNG Passenger Cars

- Energy consumption shows the same trend, but with lower values for the entire speed range.
- CO, HC, NOX & SPN23 emissions are lower than COPERTv5.6 for all speeds.
- CH4 emissions are lower than COPERTv5.6, in every mode. Highest change is noticed in urban mode.

Vehicles affected by the last update

| Category | Fuel | Technology | Segment |
|---------------|------|--------------|---------------------------------------|
| Passenger Car | CNG | Euro 6d-temp | Mini/ Small/ Medium/ Large- SUV |
| Passenger Car | CNG | Euro 6d | Mini/ Small/ Medium/ Large- SUV |

Revision of Euro VI diesel & diesel hybrid buses



Vehicle measurements

- Vehicles

| Category | Buses | Buses |
|--------------------|-----------------------------------|------------------------------|
| Fuel | Diesel | Diesel hybrid |
| Euro Standard | Euro VI A/B | Euro VI A/B |
| Number of vehicles | 6 | 5 |
| Segment | Urban Buses Standard 15 – 18 t | Urban Buses Diesel Hybrid |

- Measurements

On-road measurements in Paris
(conducted by AirParif)

- Pollutants measured:

NO_x, CO, SPN23 & EC

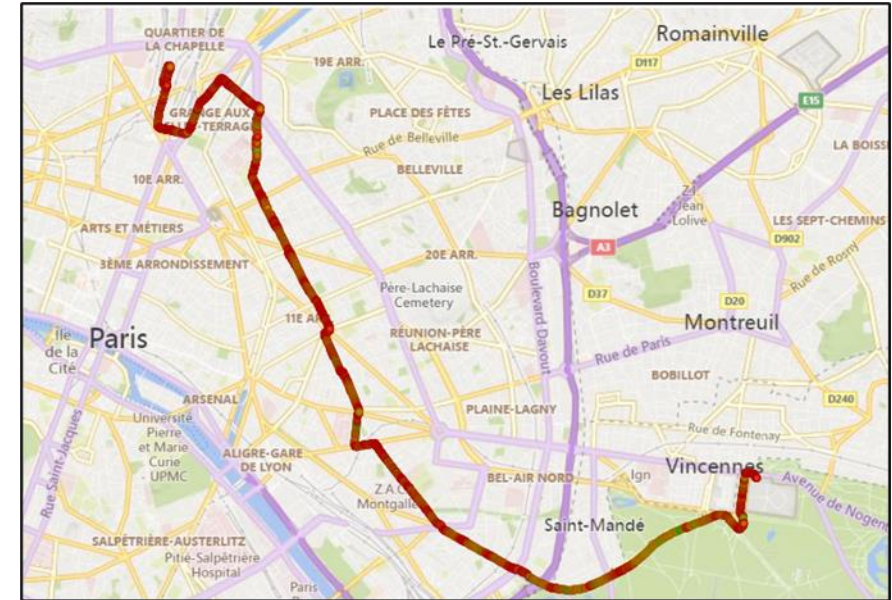
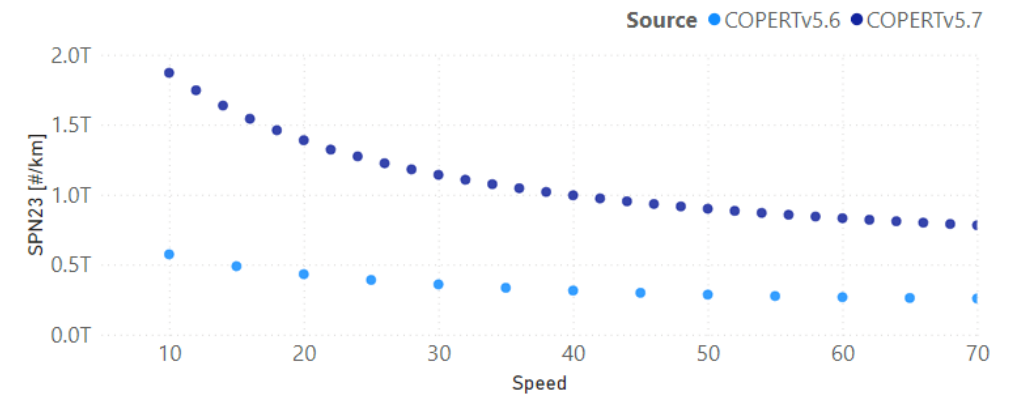
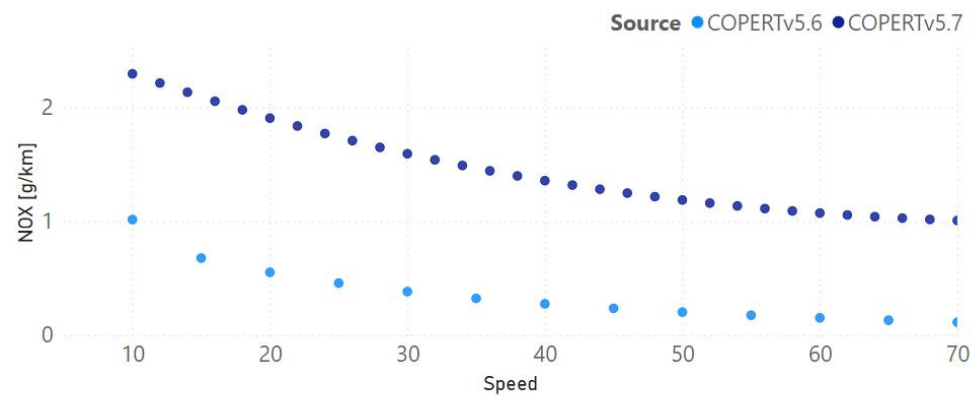
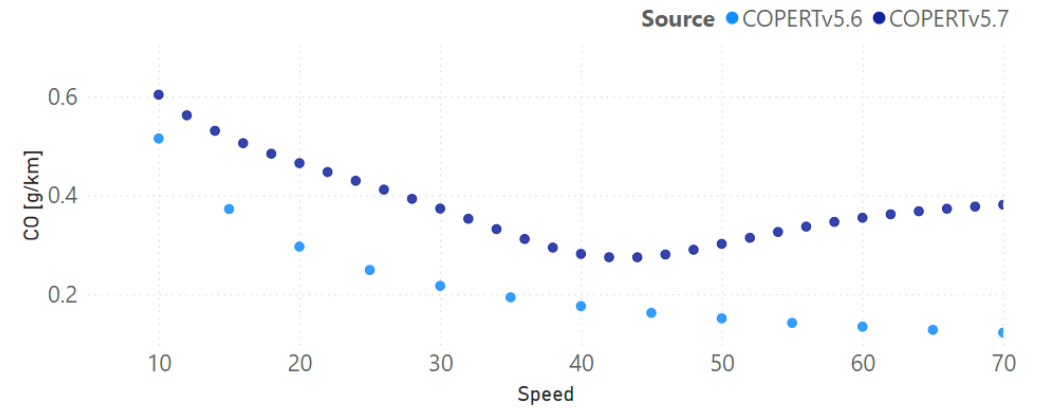
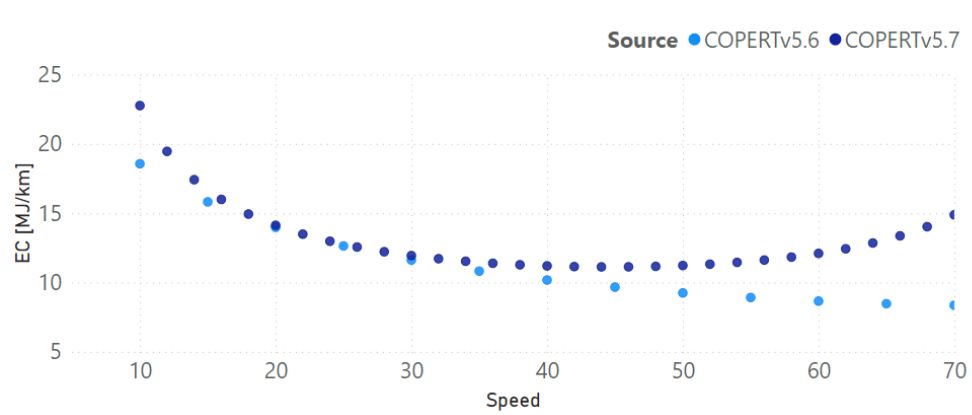
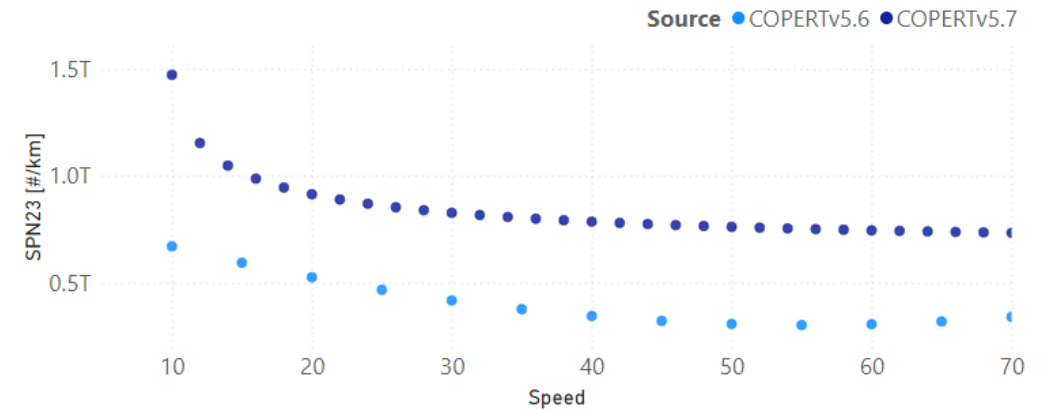
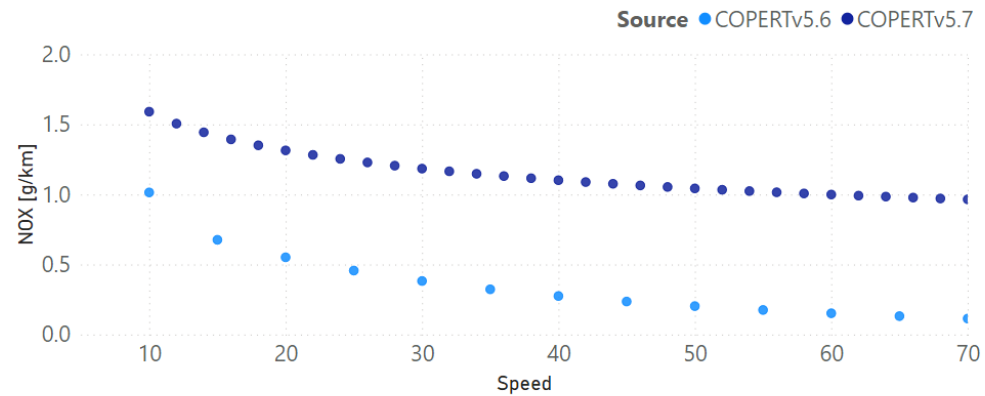
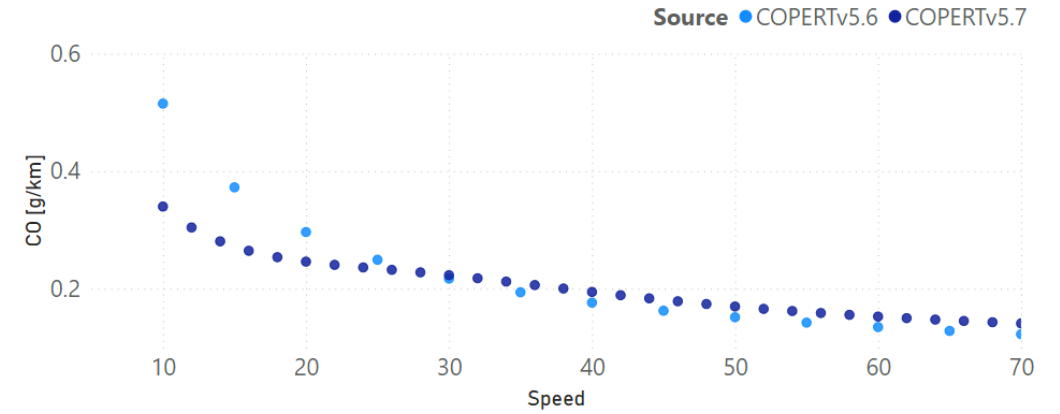
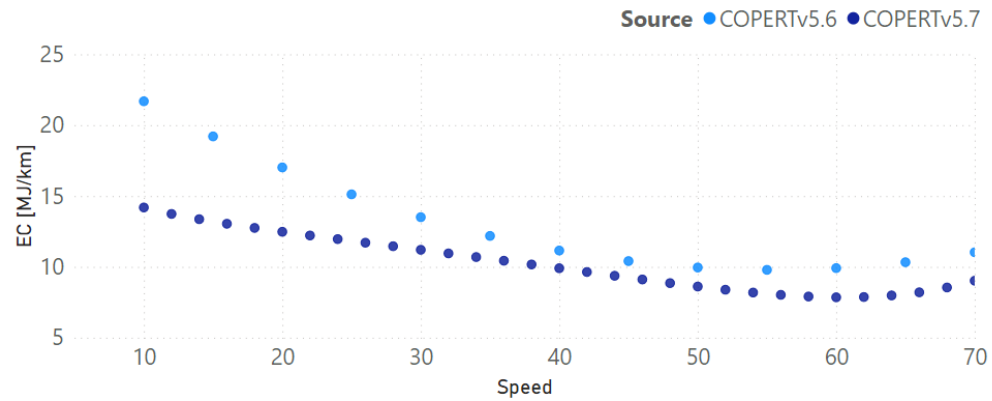


Figure x: Road trip example

Euro VI diesel buses



Euro VI diesel hybrid buses



Conclusions

Euro VI diesel buses

- Similar energy consumption with COPERTv5.6 in low speeds but increased in high speeds
- CO, NOX & SPN23 emissions are higher than COPERTv5.6 for all speeds

Euro VI diesel hybrid buses

- Small increase of energy consumption compared to COPERTv5.6, especially in high speeds
- CO emissions are higher for low speeds than COPERTv5.6
- NOX and SPN23 emissions are higher than COPERTv5.6 across all speeds

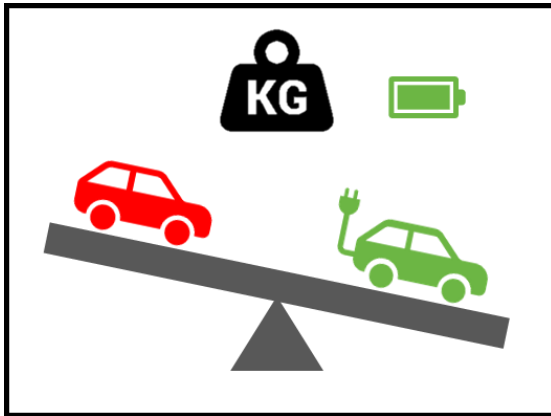
Vehicles affected by the last update

| Characteristics | Diesel buses | Diesel hybrid buses |
|-----------------|-------------------------|-------------------------|
| Category | Buses | Buses |
| Fuel | Diesel | Diesel Hybrid ~ Diesel |
| Segment | Urban Buses | Urban Buses |
| Euro Standard | Euro VI A/B/C, Euro D/E | Euro VI A/B/C, Euro D/E |



Revision of non-exhaust emission factors



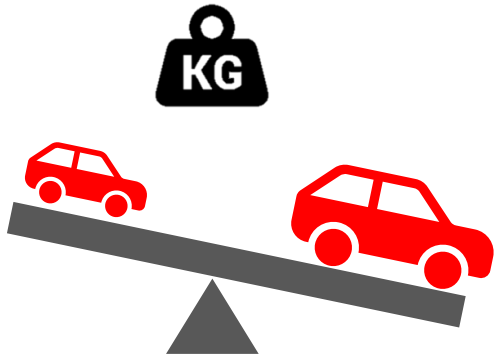


TSP base emission factors of PC [mg/km]

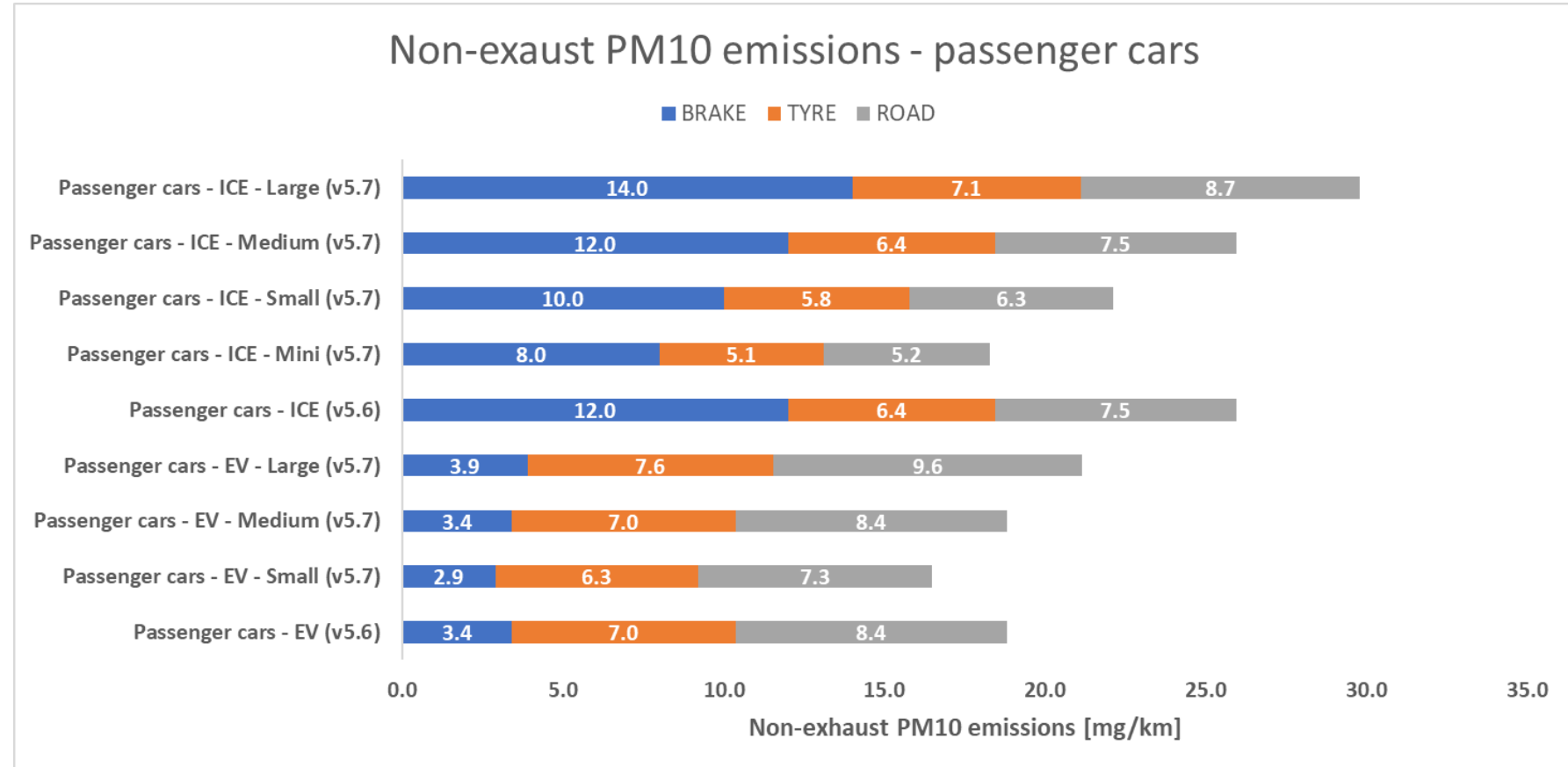
| Powertrain | Tyre | Brake | Road |
|------------|------|-------|------|
| ICE | 10.7 | 12.2 | 15.0 |
| Hybrid | 11.1 | 9.7 | 15.9 |
| PHEV | 11.2 | 6.6 | 16.1 |
| BEV | 11.6 | 3.4 | 16.9 |

No impact of vehicle weight among ICE vehicles

COPERTv5.7 - Impact of Vehicle Weight



- Impact of vehicle weight
- WLTP brake cycle
- Low-Steel brake pads
- Euro 7 targets for brake emissions of LDVs:
 - 7 mg/km from 2025
 - 3 mg/km from 2035



- [Beddows & Harrison, 2021](#)
- [Liu et al, 2021](#)
- [Woo et al, 2022](#)
- [Oroumiyeh & Zhu, 2021](#)



Conclusions

Impact of vehicle weight on NEE

- Differentiation of non-exhaust emission factors based on vehicle weight
- No reliable data for HDVs
- non-exhaust emission factors for medium passenger cars same with COPERTv5.6
- Changes in mini, small, large based on recent studies

Vehicles affected by the last update

| Category | Fuel | Technology | Segment |
|----------------|------|------------|--------------------|
| Passenger Cars | All | All | Mini/ Small/ Large |

| | Difference | Unit |
|------------------------------|------------|------|
| Weight | 350 | kg |
| Non-Exhaust emissions | | |
| Brake | 10 – 20 | [%] |
| Tire | | |
| Road | | |



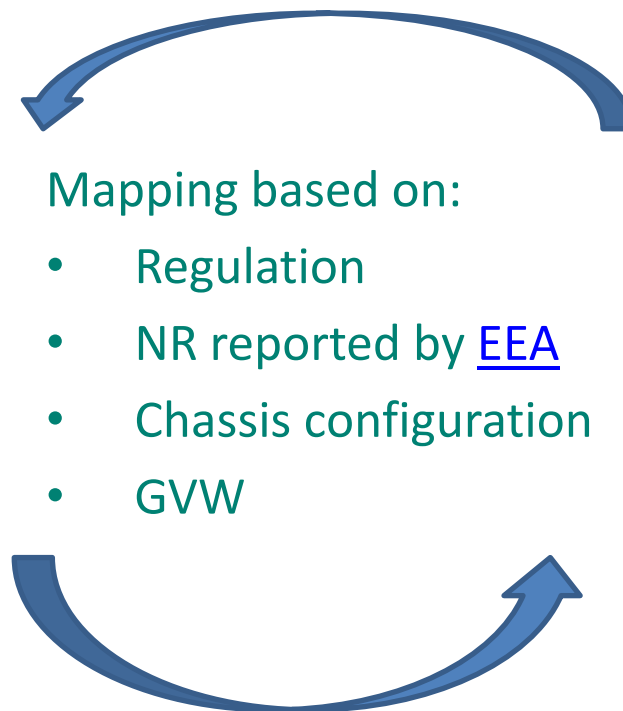
Alternative HDVs classification based on REG EU 2017/2400



Alternative HDVs classification based on REG EU 2017/2400

HDTs groups based on [REG EU 2017/2400](#)

| Description of elements relevant to the classification in vehicle groups | | | Vehicle group |
|--|----------------------------|---|---------------|
| Axle configuration | Chassis configuration | Technically permissible maximum laden mass (tons) | |
| 4x2 | Rigid lorry | > 3,5 – 7,5 | (0) |
| | Rigid lorry (or tractor)** | > 7,5 – 10 | 1 |
| | Rigid lorry (or tractor)** | > 10 – 12 | 2 |
| | Rigid lorry (or tractor)** | > 12 – 16 | 3 |
| | Rigid lorry | > 16 | 4 |
| | Tractor | > 16 | 5 |
| | Rigid lorry | > 16 | 4v*** |
| | Tractor | > 16 | 5v*** |
| 4x4 | Rigid lorry | > 7,5 – 16 | (6) |
| | Rigid lorry | > 16 | (7) |
| | Tractor | > 16 | (8) |
| 6x2 | Rigid lorry | all weights | 9 |
| | Tractor | all weights | 10 |
| | Rigid lorry | all weights | 9v*** |
| | Tractor | all weights | 10v*** |
| 6x4 | Rigid lorry | all weights | 11 |
| | Tractor | all weights | 12 |
| 6x6 | Rigid lorry | all weights | (13) |
| | Tractor | all weights | (14) |
| 8x2 | Rigid lorry | all weights | (15) |
| 8x4 | Rigid lorry | all weights | 16 |
| 8x6 8x8 | Rigid lorry | all weights | (17) |



COPERT

| Heavy-Duty Vehicles | |
|---------------------|-----------------------|
| Petrol | >3,5 t |
| Diesel | Rigid <=7,5 t |
| Diesel | Rigid 7,5 - 12 t |
| Diesel | Rigid 12 - 14 t |
| Diesel | Rigid 14 - 20 t |
| Diesel | Rigid 20 - 26 t |
| Diesel | Rigid 26 - 28 t |
| Diesel | Rigid 28 - 32 t |
| Diesel | Rigid >32 t |
| Diesel | Articulated 14 - 20 t |
| Diesel | Articulated 20 - 28 t |
| Diesel | Articulated 28 - 34 t |
| Diesel | Articulated 34 - 40 t |
| Diesel | Articulated 40 - 50 t |
| Diesel | Articulated 50 - 60 t |

Allocation of VECTO HDTs groups to COPERT groups & vice versa

REG EU 2017/2400 groups → COPERT HDTs groups

| | | | axles | | 4X2 | | | | | | 4X4 | | | 6X2 | | 6X4 | | 6X6 | | 8X2 | 8X4 | 8X6 8X8 | 8 axled tractor | 5 axles |
|-------------------|--------|---------------------|-------|------|------|-------|--------|--------|--------|---------|------|------|------|--------|--------|-------|-------|------|------|------|-------|---------|-----------------|---------|
| | | | Sales | | 123 | 3,121 | 13,327 | 12,031 | 32,608 | 283,107 | 6 | 7 | 8 | 66,283 | 13,613 | 2,377 | 1,314 | | | | 3,576 | | | |
| Category | Fuel | GVW Segment | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | | |
| Heavy Duty Trucks | Petrol | >3,5 t | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | |
| Heavy Duty Trucks | Diesel | Rigid <= 7,5 t | 100% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | |
| Heavy Duty Trucks | Diesel | Rigid 7,5 - 12 t | 0% | 100% | 100% | 0% | 0% | 0% | 33% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | |
| Heavy Duty Trucks | Diesel | Rigid 12 - 14 t | 0% | 0% | 0% | 8% | 0% | 0% | 33% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | |
| Heavy Duty Trucks | Diesel | Rigid 14 - 20 t | 0% | 0% | 0% | 92% | 61% | 0% | 33% | 61% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | |
| Heavy Duty Trucks | Diesel | Rigid 20 - 26 t | 0% | 0% | 0% | 0% | 39% | 0% | 0% | 39% | 0% | 3% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | |
| Heavy Duty Trucks | Diesel | Rigid 26 - 28 t | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 75% | 0% | 7% | 0% | 7% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | |
| Heavy Duty Trucks | Diesel | Rigid 28 - 32 t | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 22% | 0% | 67% | 0% | 67% | 0% | 3% | 3% | 3% | 0% | 0% | | |
| Heavy Duty Trucks | Diesel | Rigid >32 t | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 26% | 0% | 26% | 0% | 97% | 97% | 97% | 0% | 100% | | |
| Heavy Duty Trucks | Diesel | Articulated 14 - 20 | 0% | 0% | 0% | 0% | 0% | 49% | 0% | 0% | 49% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | |
| Heavy Duty Trucks | Diesel | Articulated 20 - 28 | 0% | 0% | 0% | 0% | 0% | 51% | 0% | 0% | 51% | 0% | 81% | 0% | 7% | 0% | 7% | 0% | 0% | 0% | 0% | 0% | 0% | |
| Heavy Duty Trucks | Diesel | Articulated 28 - 34 | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 19% | 0% | 71% | 0% | 71% | 0% | 0% | 0% | 0% | 0% | 0% | |
| Heavy Duty Trucks | Diesel | Articulated 34 - 40 | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 22% | 0% | 22% | 0% | 0% | 0% | 0% | 0% | 0% | |
| Heavy Duty Trucks | Diesel | Articulated 40 - 50 | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 1% | 0% | 1% | 0% | 0% | 0% | 0% | 0% | 0% | |
| Heavy Duty Trucks | Diesel | Articulated 50 - 60 | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | |
| TOTAL | | | 200% | 200% | 200% | 200% | 200% | 200% | 200% | 200% | 200% | 200% | 200% | 200% | 200% | 200% | 200% | 200% | 200% | 200% | 200% | 200% | 200% | |

COPERT HDTs groups → REG EU 2017/2400 groups

| | | | axles | | 4X2 | | | | | | 4X4 | | | 6X2 | | 6X4 | | 6X6 | | 8X2 | 8X4 | 8X6 8X8 | 8 axled tractor | 5 axles | |
|---------------------|--------|---------------------|---|-------|-------|-------|--------|--------|--------|---------|-------|--------|-------|--------|--------|-------|-------|-------|-------|-------|-------|---------|-----------------|---------|-------|
| | | | Sales | | 123 | 3,121 | 13,327 | 12,031 | 32,608 | 283,107 | 6 | 7 | 8 | 66,283 | 13,613 | 2,377 | 1,314 | | | | 3,576 | | | | TOTAL |
| Available in COPERT | | | Veh Groups in to be updated based on REG 2017/2400/EU | | | | | | | | | | | | | | | | | | | | | | |
| Category | Fuel | GVW Segment | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | | | |
| Heavy Duty Trucks | Petrol | >3,5 t | 0.03% | 0.72% | 3.09% | 2.79% | 7.56% | 65.61% | 0.00% | 0.00% | 0.00% | 15.36% | 3.15% | 0.55% | 0.30% | 0.00% | 0.00% | 0.00% | 0.83% | 0.00% | 0.00% | 0.00% | 0.00% | 100.00% | |
| Heavy Duty Trucks | Diesel | Rigid <= 7,5 t | 100% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 100.00% | |
| Heavy Duty Trucks | Diesel | Rigid 7,5 - 12 t | 0% | 19% | 81% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 100.00% | |
| Heavy Duty Trucks | Diesel | Rigid 12 - 14 t | 0% | 0% | 0% | 100% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 100.00% | |
| Heavy Duty Trucks | Diesel | Rigid 14 - 20 t | 0% | 0% | 0% | 36% | 64% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 100.00% | |
| Heavy Duty Trucks | Diesel | Rigid 20 - 26 t | 0% | 0% | 0% | 0% | 86% | 0% | 0% | 0% | 0% | 14% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 100.00% | |
| Heavy Duty Trucks | Diesel | Rigid 26 - 28 t | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 100% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 100.00% | |
| Heavy Duty Trucks | Diesel | Rigid 28 - 32 t | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 89% | 0% | 10% | 0% | 0% | 0% | 0% | 1% | 0% | 0% | 0% | 0% | 100.00% | |
| Heavy Duty Trucks | Diesel | Rigid >32 t | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 15% | 0% | 0% | 0% | 85% | 0% | 0% | 0% | 0% | 0% | 100.00% | |
| Heavy Duty Trucks | Diesel | Articulated 14 - 20 | 0% | 0% | 0% | 0% | 0% | 100% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 100.00% | |
| Heavy Duty Trucks | Diesel | Articulated 20 - 28 | 0% | 0% | 0% | 0% | 0% | 93% | 0% | 0% | 0% | 0% | 7% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 100.00% | |
| Heavy Duty Trucks | Diesel | Articulated 28 - 34 | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 74% | 0% | 26% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 100.00% | |
| Heavy Duty Trucks | Diesel | Articulated 34 - 40 | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 100% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 100.00% | |
| Heavy Duty Trucks | Diesel | Articulated 40 - 50 | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 100% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 100.00% | |
| Heavy Duty Trucks | Diesel | Articulated 50 - 60 | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 100.00% | |

Conclusions

HDTs groups based on [REG EU 2017/2400](#)

Advantages:

- Do not replace existing HDTs' classification system in COPERT
- User can select the classification system for reporting emissions
- New **Import/Export** buttons of input structure/emissions of HDTs in groups based on REG EU 2017/2400
- User can easily update the default matrices (based on the latest data reported by EEA)
- Do not lose any emissions during remapping
- Future extension to buses

Limitations:

- Remapping based on limited EU data for NR
- Only stock can be imported in VECTO groups
- Not all HDVs groups are regulated yet
- Default Matrices change each time new updated data are reported by EEA

Vehicles that can be classified in VECTO groups

| Category | Fuel | Technology | Segment |
|----------|------|------------|---------|
| HDTs | All | All | All |

Mapping HDVs to/from VECTO Groups

COPERT -> Ve... Undo Redo Import Export

| Vehicle | | | | 0 | 1 | 2 | 3 | 4 | 5 |
|-------------------|--------|-----------------------|-----------------|---------------------|--------------------|-------------------|-------------------|-------------------|-----------------|
| Category | Fuel | Segment | Type | | | | | | |
| Heavy Duty Trucks | Petrol | >3,5 t | COPERT -> Vecto | 0.0285065356447576% | 0.723324371929174% | 3.08867154908686% | 2.78831000278113% | 7.55724483174191% | 65.61300639658% |
| Heavy Duty Trucks | Diesel | Rigid <=7,5 t | COPERT -> Vecto | 100% | 0% | 0% | 0% | 0% | |
| Heavy Duty Trucks | Diesel | Rigid 7,5 - 12 t | COPERT -> Vecto | 0% | 18.9749513618677% | 81.0250486381323% | 0% | 0% | |
| Heavy Duty Trucks | Diesel | Rigid 12 - 14 t | COPERT -> Vecto | 0% | 0% | 0% | 100% | 0% | |
| Heavy Duty Trucks | Diesel | Rigid 14 - 20 t | COPERT -> Vecto | 0% | 0% | 0% | 35.5483226450968% | 64.4516773549032% | |
| Heavy Duty Trucks | Diesel | Rigid 20 - 26 t | COPERT -> Vecto | 0% | 0% | 0% | 0% | 86.3088718510405% | |
| Heavy Duty Trucks | Diesel | Rigid 26 - 28 t | COPERT -> Vecto | 0% | 0% | 0% | 0% | 0% | |
| Heavy Duty Trucks | Diesel | Rigid 28 - 32 t | COPERT -> Vecto | 0% | 0% | 0% | 0% | 0% | |
| Heavy Duty Trucks | Diesel | Rigid >32 t | COPERT -> Vecto | 0% | 0% | 0% | 0% | 0% | |
| Heavy Duty Trucks | Diesel | Articulated 14 - 20 t | COPERT -> Vecto | 0% | 0% | 0% | 0% | 0% | 1% |
| Heavy Duty Trucks | Diesel | Articulated 20 - 28 t | COPERT -> Vecto | 0% | 0% | 0% | 0% | 0% | 92.90237078486% |
| Heavy Duty Trucks | Diesel | Articulated 28 - 34 t | COPERT -> Vecto | 0% | 0% | 0% | 0% | 0% | |
| Heavy Duty Trucks | Diesel | Articulated 34 - 40 t | COPERT -> Vecto | 0% | 0% | 0% | 0% | 0% | |
| Heavy Duty Trucks | Diesel | Articulated 40 - 50 t | COPERT -> Vecto | 0% | 0% | 0% | 0% | 0% | |

The provided percentages are indicative and have been extracted by the data published by EEA

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Bug corrections in COPERT v5.7



Bug Corrections in COPERT v5.7

- Cold start ratio of diesel Euro 6 cars for NOX & CO for $T < 0^{\circ}$
- Cold start ratio of petrol-fueled cars and vans for VOC & CO and mean urban speeds between 25-35 km/h
- Cold emissions of SPN23 for Euro 6 CNG passenger cars
- Software update issues e.g., removal of CO2 correction
- Cold emissions of CO, NOx, VOC for petrol and diesel cars and vans (corrected in 5.6.5)



Planned updates for next year



Planned updates for next year

- Introduction of LNG & CNG heavy-duty trucks
- Update emission factors of petrol hybrid & PHEV passenger cars
- Update emission factors of CNG buses
- Update energy consumption factors of BEV
- Update brake emission factors
- Update emission factors for Euro 5 mopeds and motorcycles
- Revision of VOCs speciation



Thank you for your attention!

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