Performance and durability of PSA Peugeot Citroën's DPF System on a Taxi Fleet in the Paris Area

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Outlines of the presentation

- Objectives
- Methodology of the program
- Regulated exhaust emissions
  - Accumulation phase
  - Regeneration phase
- Non-regulated exhaust emissions
  - Gaseous emissions
  - Solid particles emissions
- Conclusions

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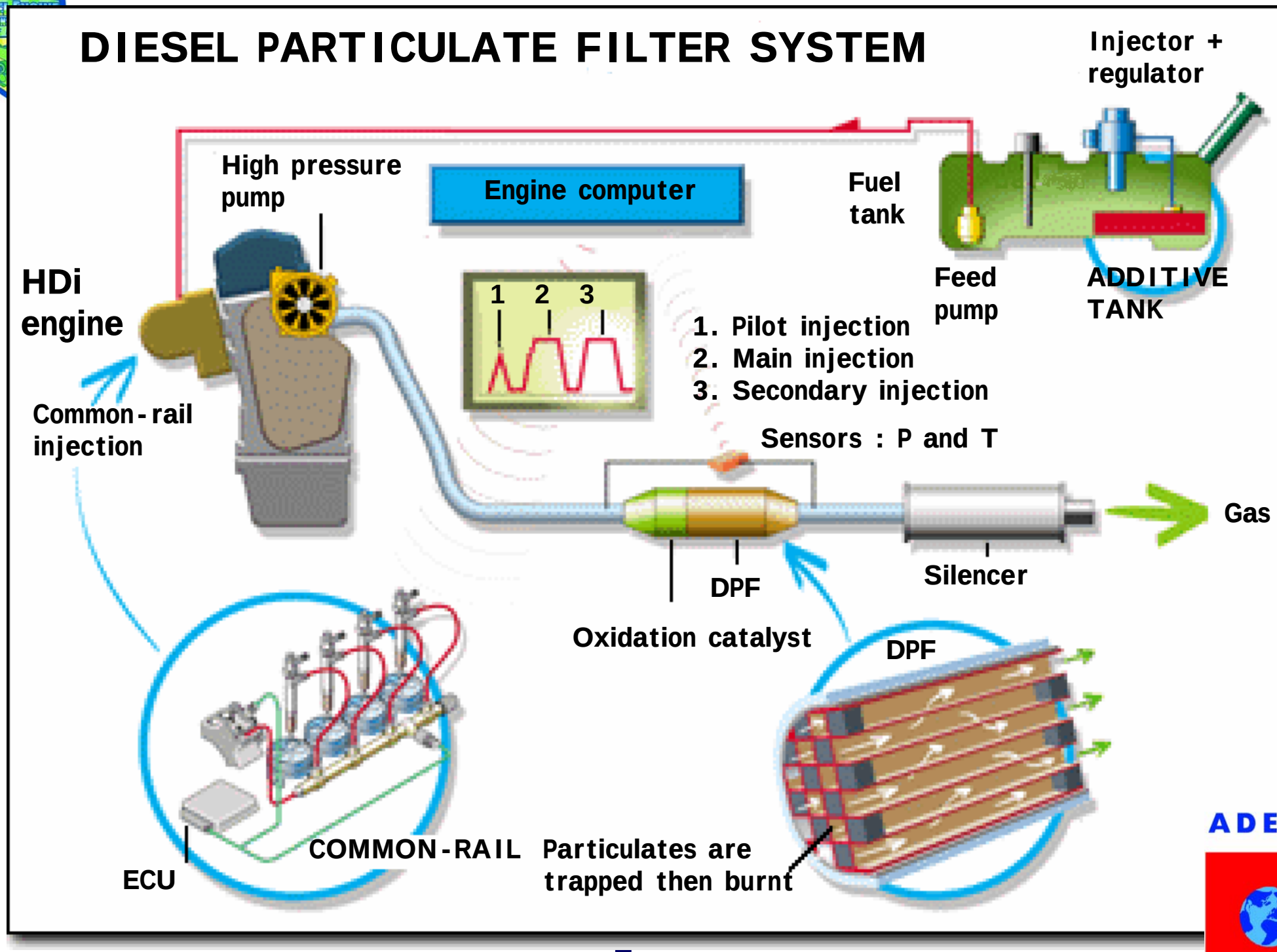
DIESEL PARTICULATE FILTER SYSTEM



Objectives of the study

The objectives are:

- to follow performance of
  5 Peugeot 607 taxis running in
  Paris traffic over 80,000 km
- under severe conditions (low speed, long idle period, urban traffic jam, low exhaust temperature…)
- on the exhaust emissions
- in term of efficiency and durability of the PSA's DPF System

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Evaluation programmes

- Five vehicles using a standard European Diesel fuel (350ppm sulfur)
- Characterizations and evaluation every 20,000 km over 80,000 km (EURO 3 standard requirement in durability)
- Regulated pollutants (CO, HC, NOx, particulates) over the MVEG Cycle
- Fuel consumption (MVEG and Field Operation)
- Non-Regulated Emissions
- Durability and reliability of the DPF System

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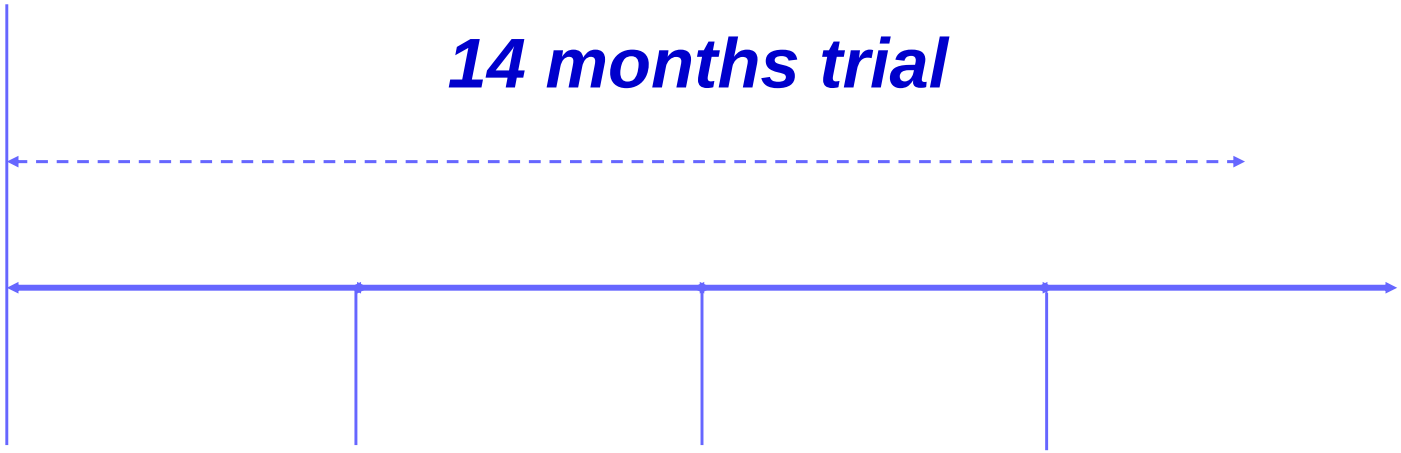
Evaluation methodology

Start January 2001



Preliminary results were presented during the 2002 SAE Powertrain & Fluid Systems Conf. SAE Paper # 2002-01-2790

120,000km

DPF Cleaning And remanufacturing

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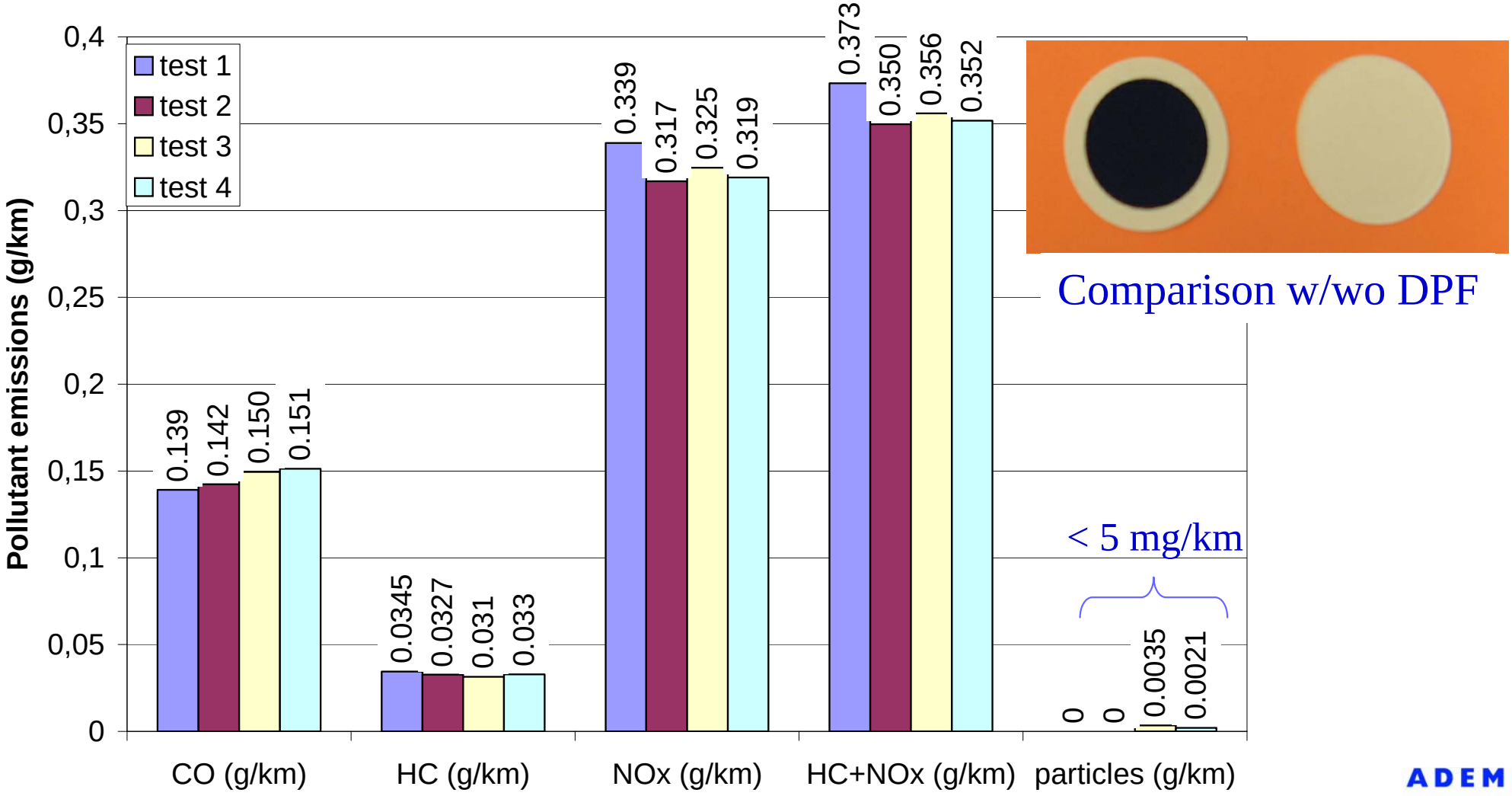
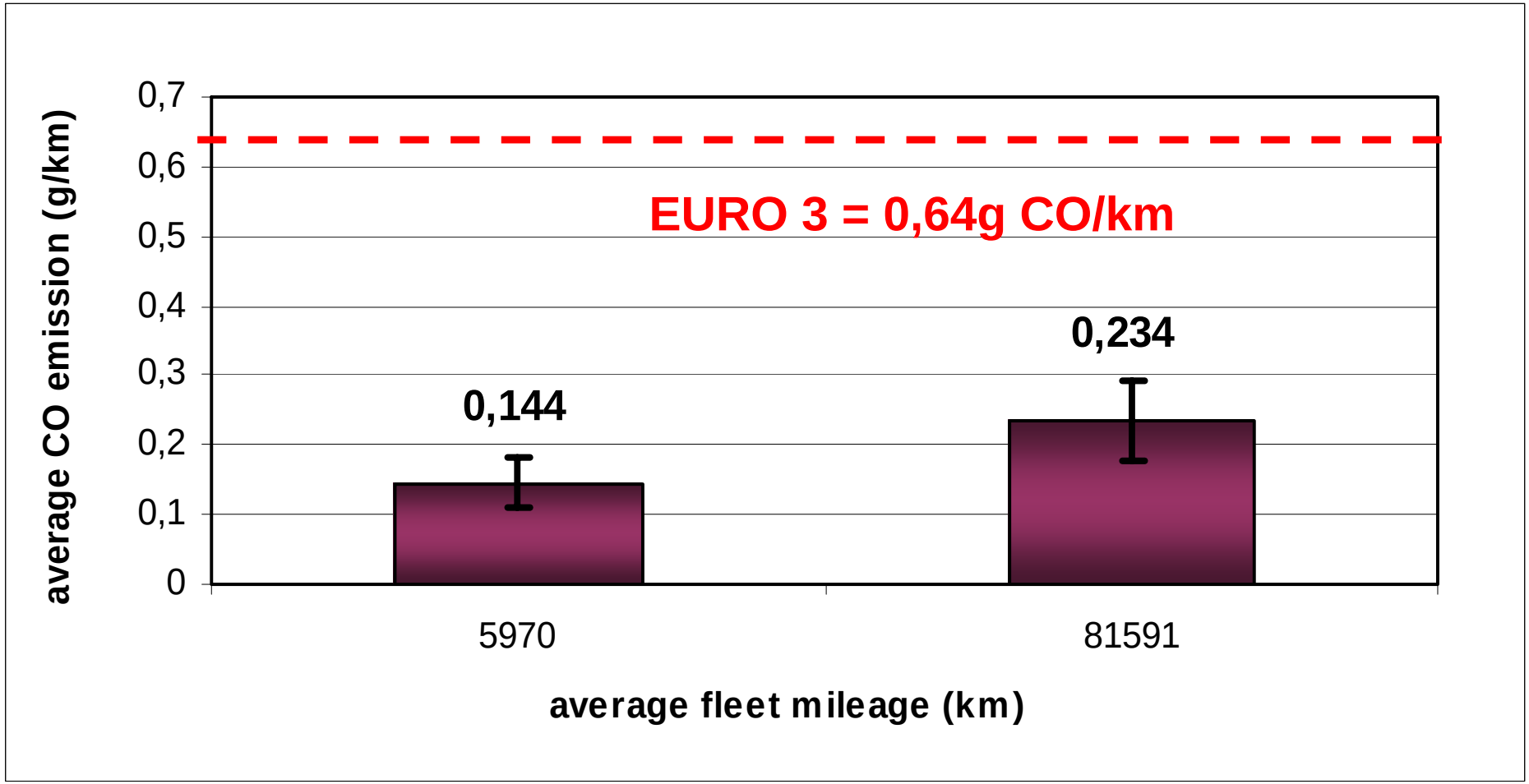
Test Repeatability (taxi 2041, fresh)

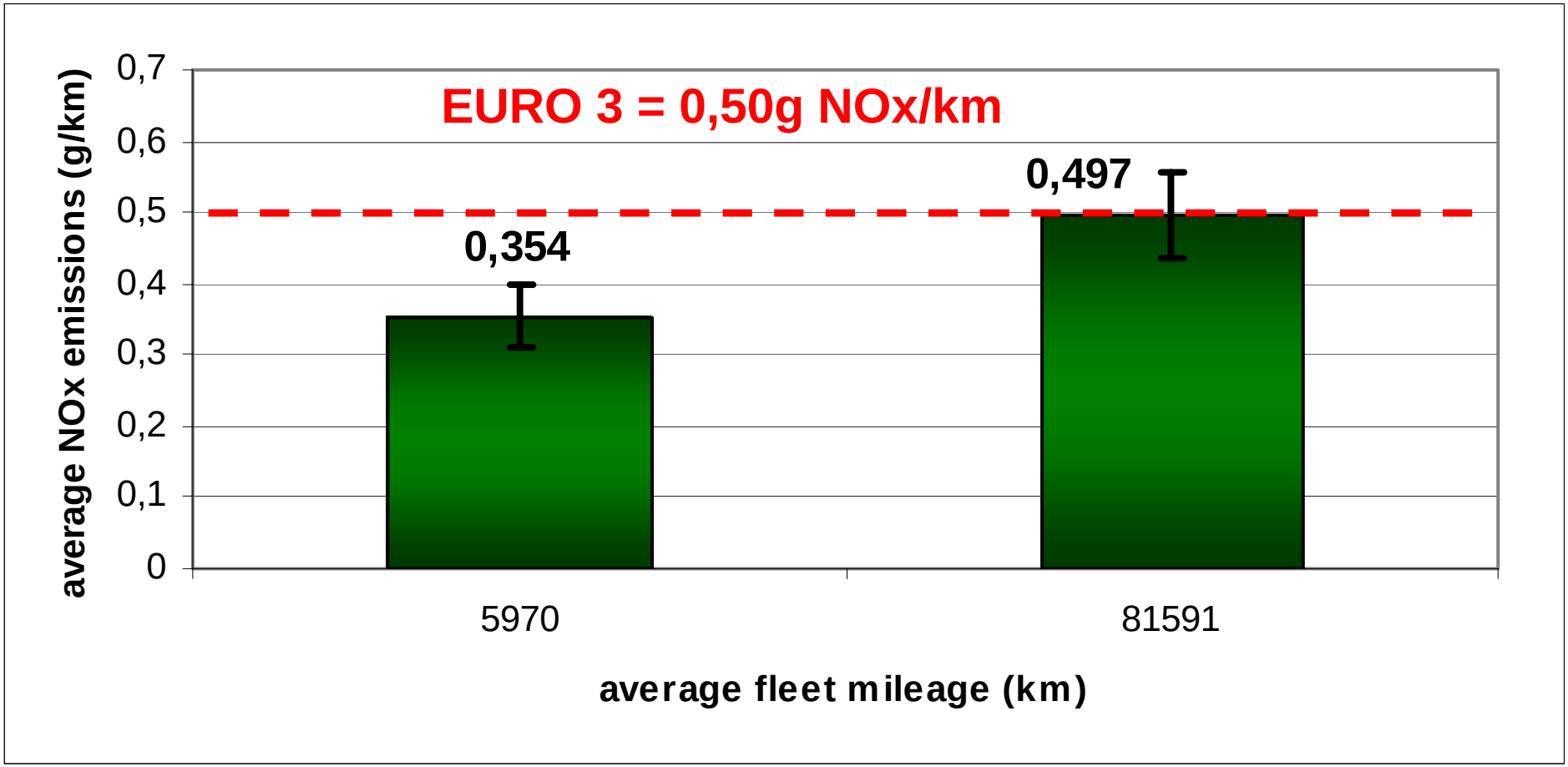


Comparison w/wo DPF

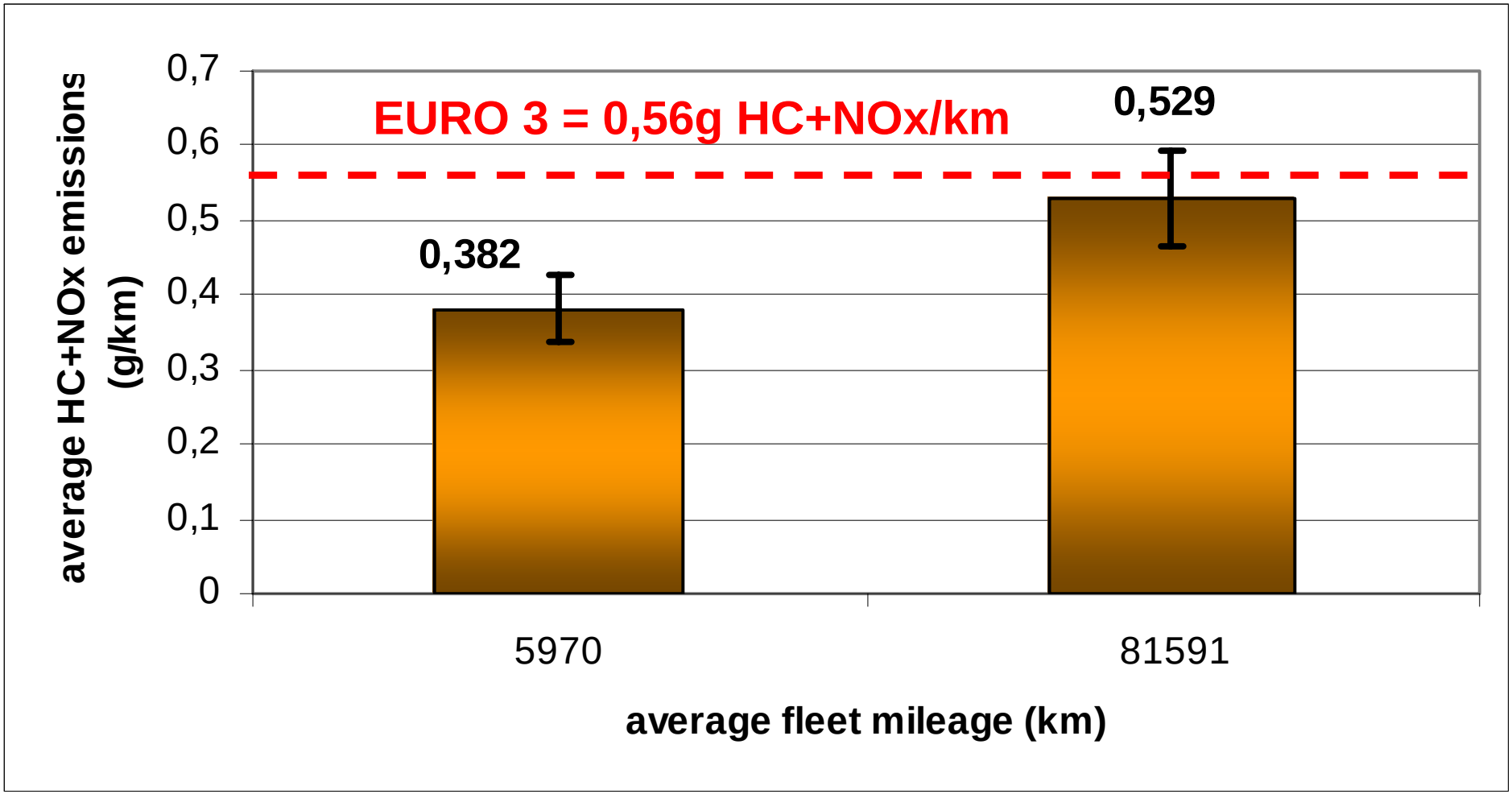
CO exhaust emissions



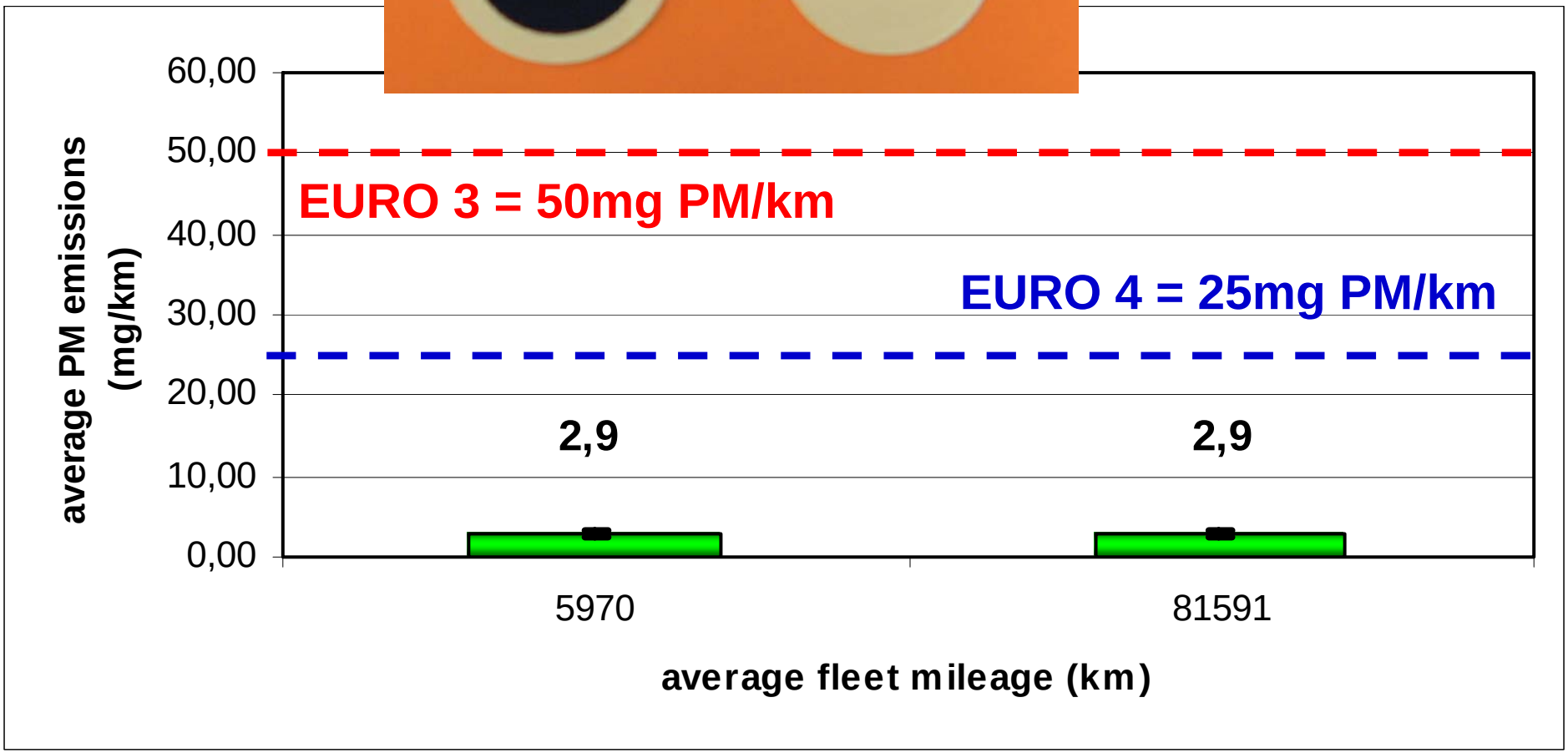
NOx exhaust emissions



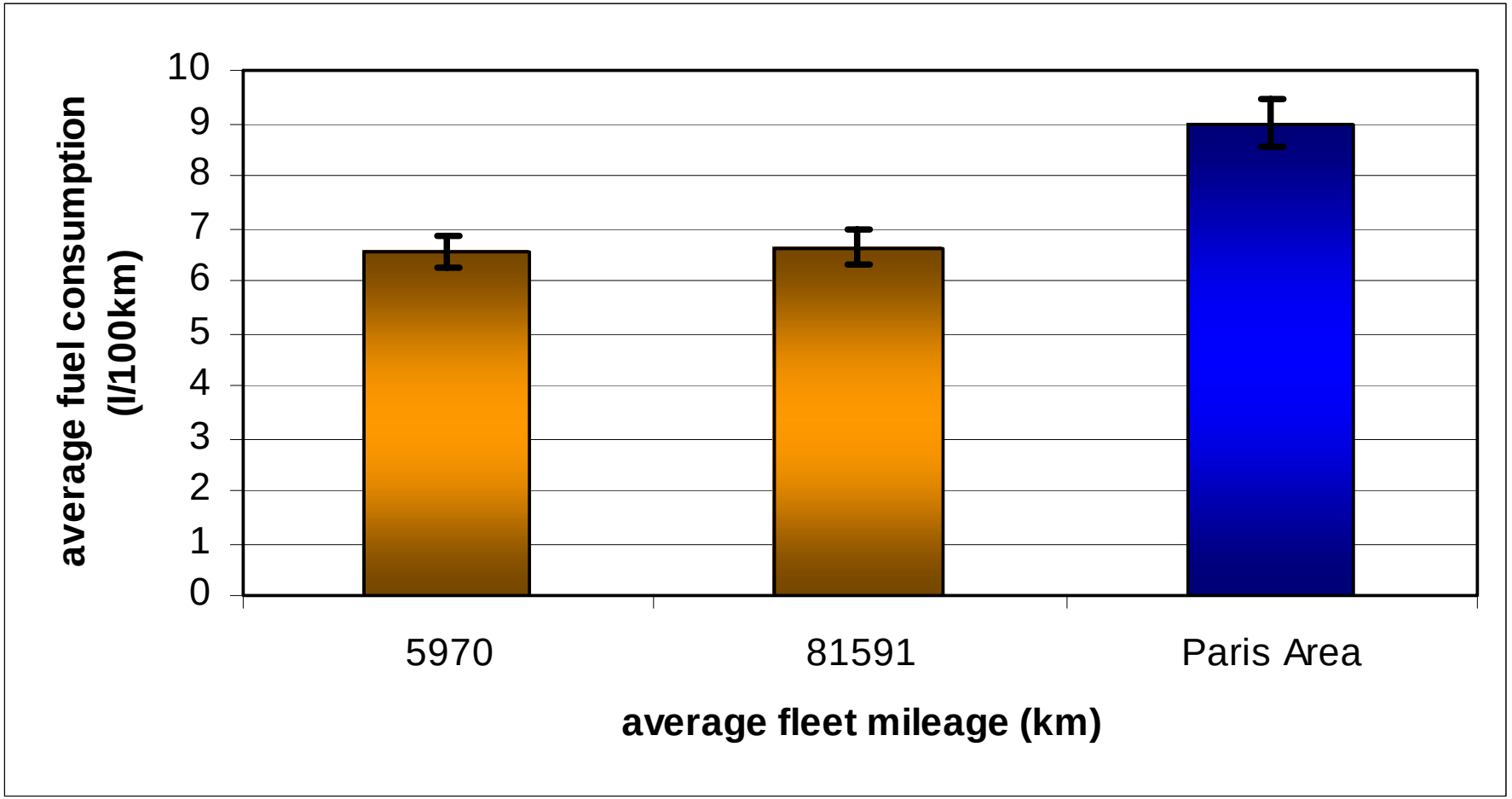
HC+NOx exhaust emissions



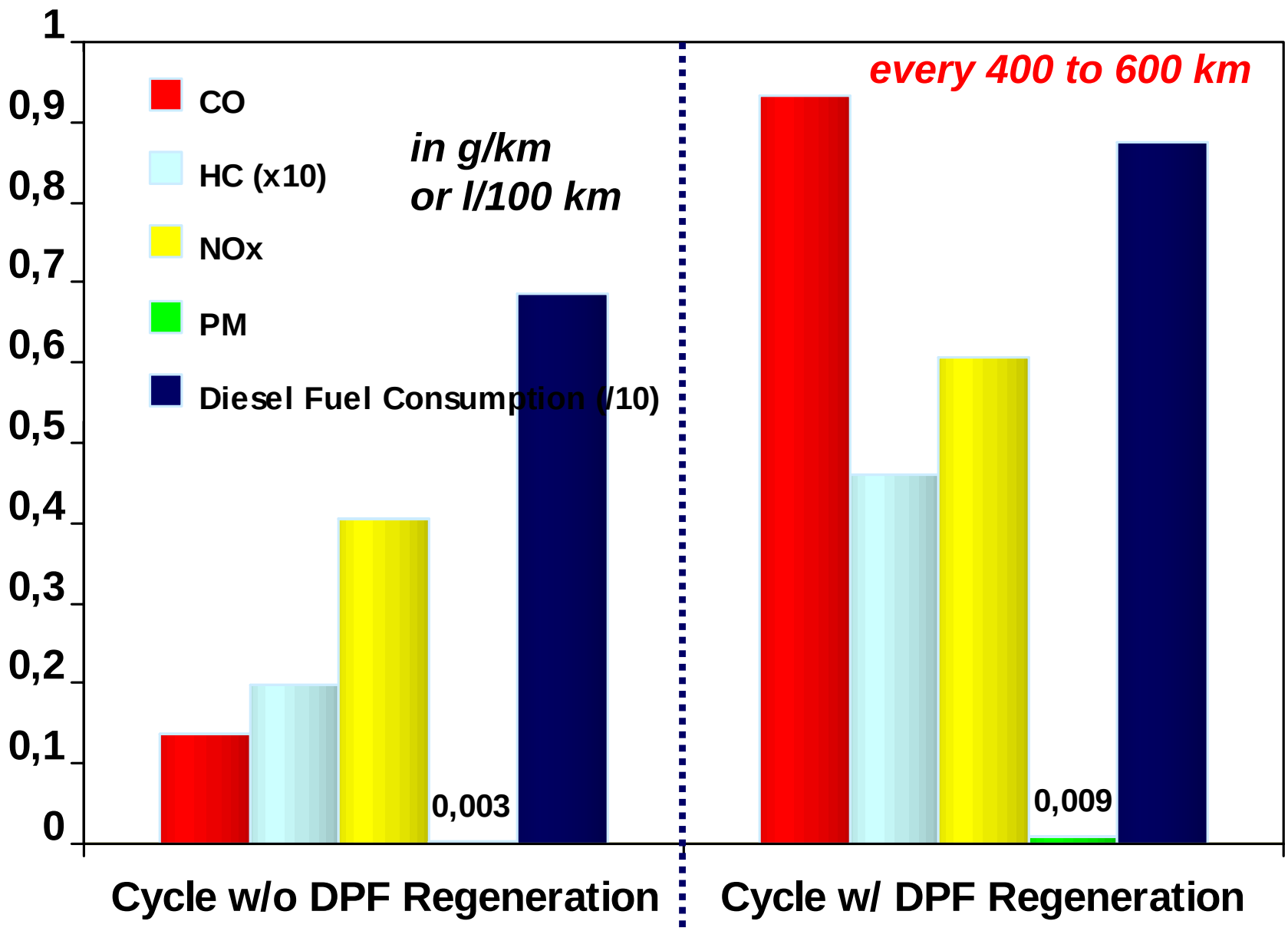
PM exhaust emissions



Average Fuel Consumptions



Emissions during DPF Regeneration



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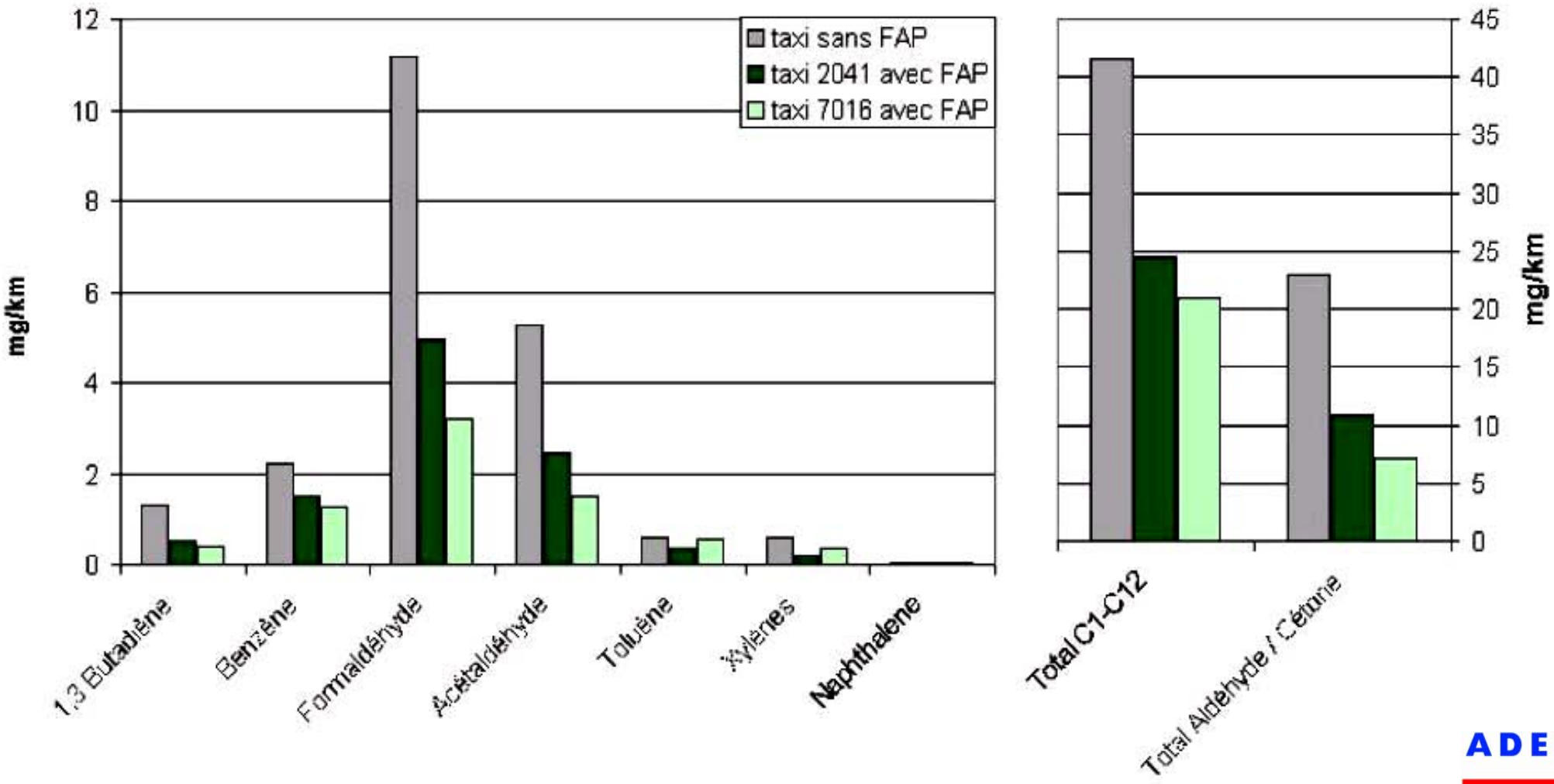
Non-Regulated Emissions



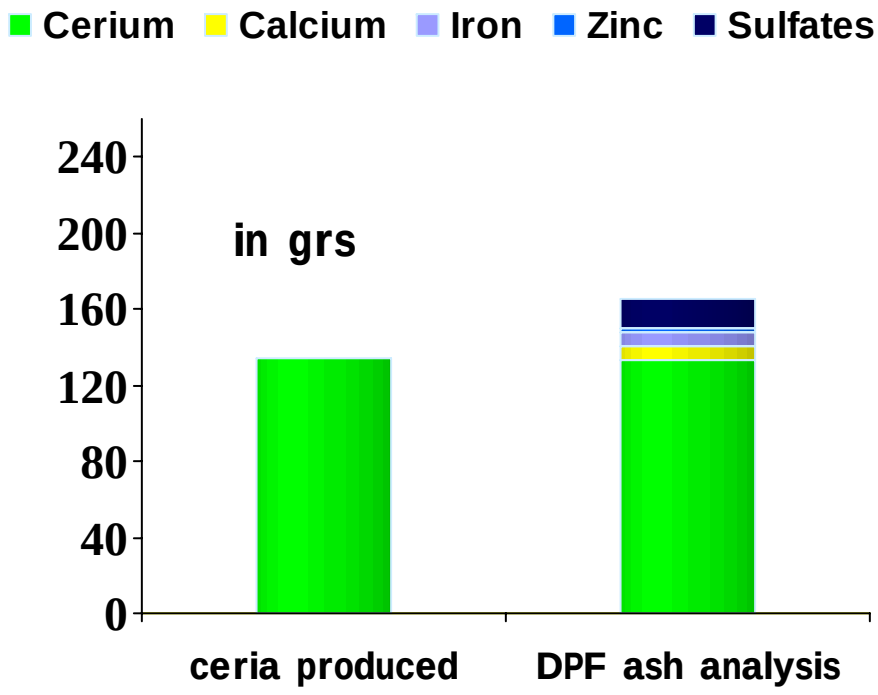
Solid particles emissions

Very Low level of Particle emissions after the DPF:

- Sulfur: 2 to 7 ng depending on the vehicle
- Potassium or Calcium: 0,2 ng
- Iron and Nickel: traces
- Ceria: undetectable (even using PIXE analysis)

Total Inorganic Ash analysis after 91200 km

Good agreement in Ceria balance, and consistent with the VERT Certification



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Conclusions

The « FAP » technology limits the particulate matter emissions under 5 mg/km over the MVEG cycle (far below the EURO 4 PM standards)

Even during DPF regenerations, the particulate emissions remain below the EURO 4 limitation

Non-regulated emissions are reduced by the DPF System under significant proportion

No Cerium leakage through the SiC-DPF

The efficiency, durability and reliability were demonstrated over 80000 km, even under severe driving cycle conditions (low speed, long idle)

Next step : durability at 120,000 km trap after re-manufacturing

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