Evolution of Pollution Control in PTI: Past, Present and Future

VERT Focus Day on NPTI for All Engines

20th March 2026 - METAS, Bern, Switzerland

Alejandro Checa

CITA Technical Director

Agenda


01 Pollution Control in PTI in the Past
02 Evolution of PTI Emission Testing
03 Future of Environmental Protection in PTI
04 Conclusion & Call to Action

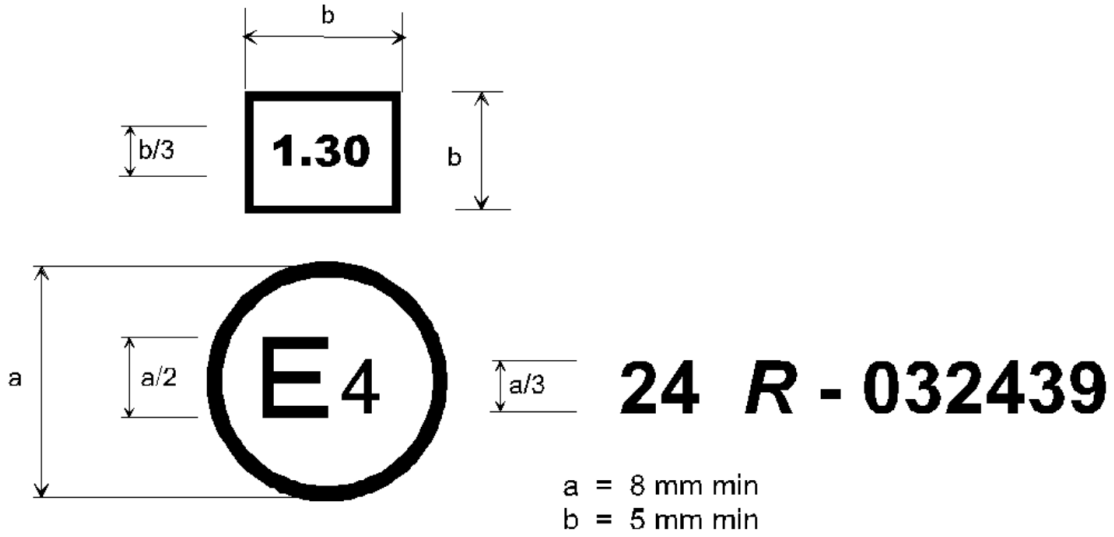
Pollution Control in PTI in the Past

- **Diesel Engines – Smoke Opacity**
  - Measures exhaust smoke density (soot particles)
  - Engine is revved under test conditions
  - Uses a smoke meter (opacity meter)
  - High opacity = poor combustion / high particulate emissions

- **Gasoline Engines – CO Emissions**
  - Measures Carbon Monoxide (CO) in exhaust
  - Tested at idle (and sometimes higher RPM)
  - Uses a gas analyzer
  - High CO = inefficient combustion / incorrect air–fuel mixture

Pollution Control in PTI in the Past

Diesel emissions control in PTI up to 2022



UN – ECE R-24 (1972)

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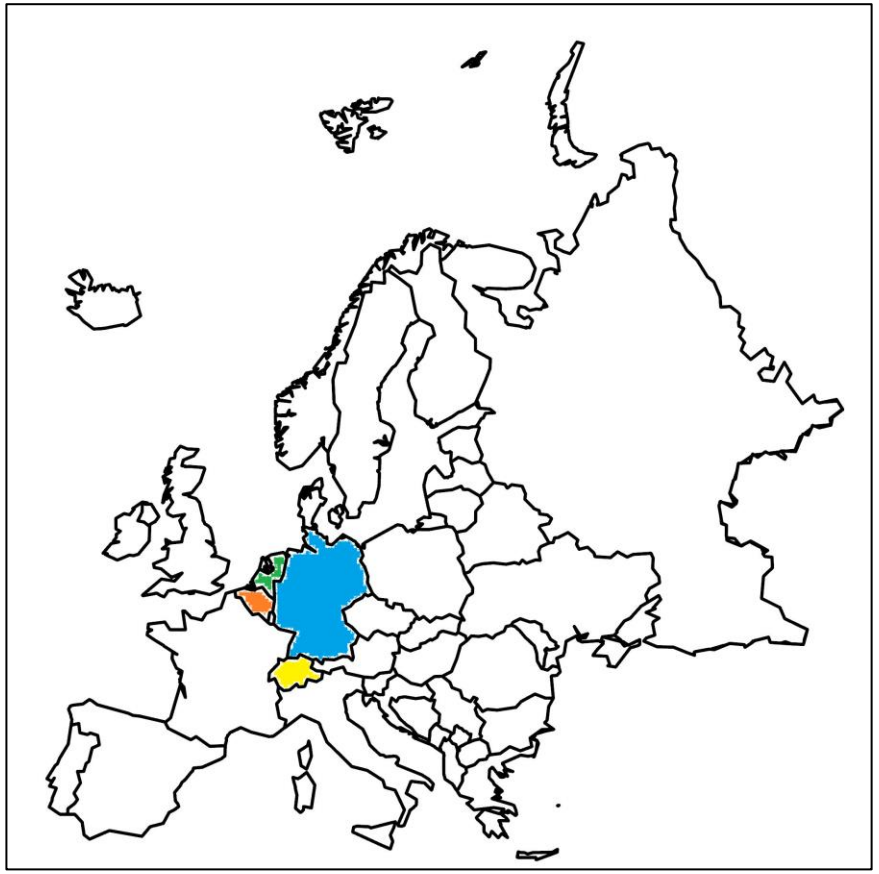
Evolution of PTI Emission Testing

Particle Number measurement already implemented in PTI in Europe:

Gross poluters indentified*

± 10%

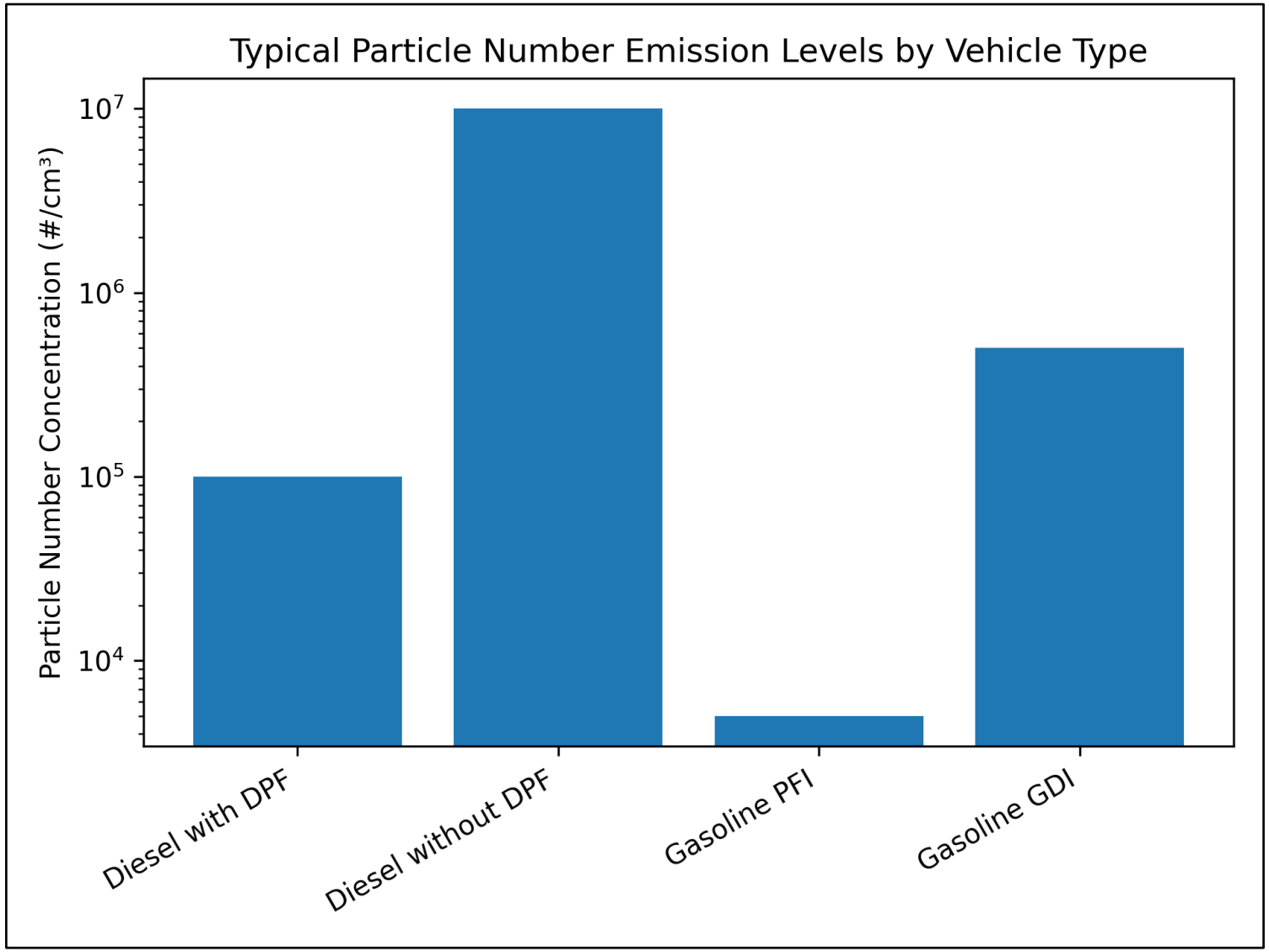


OBD detected

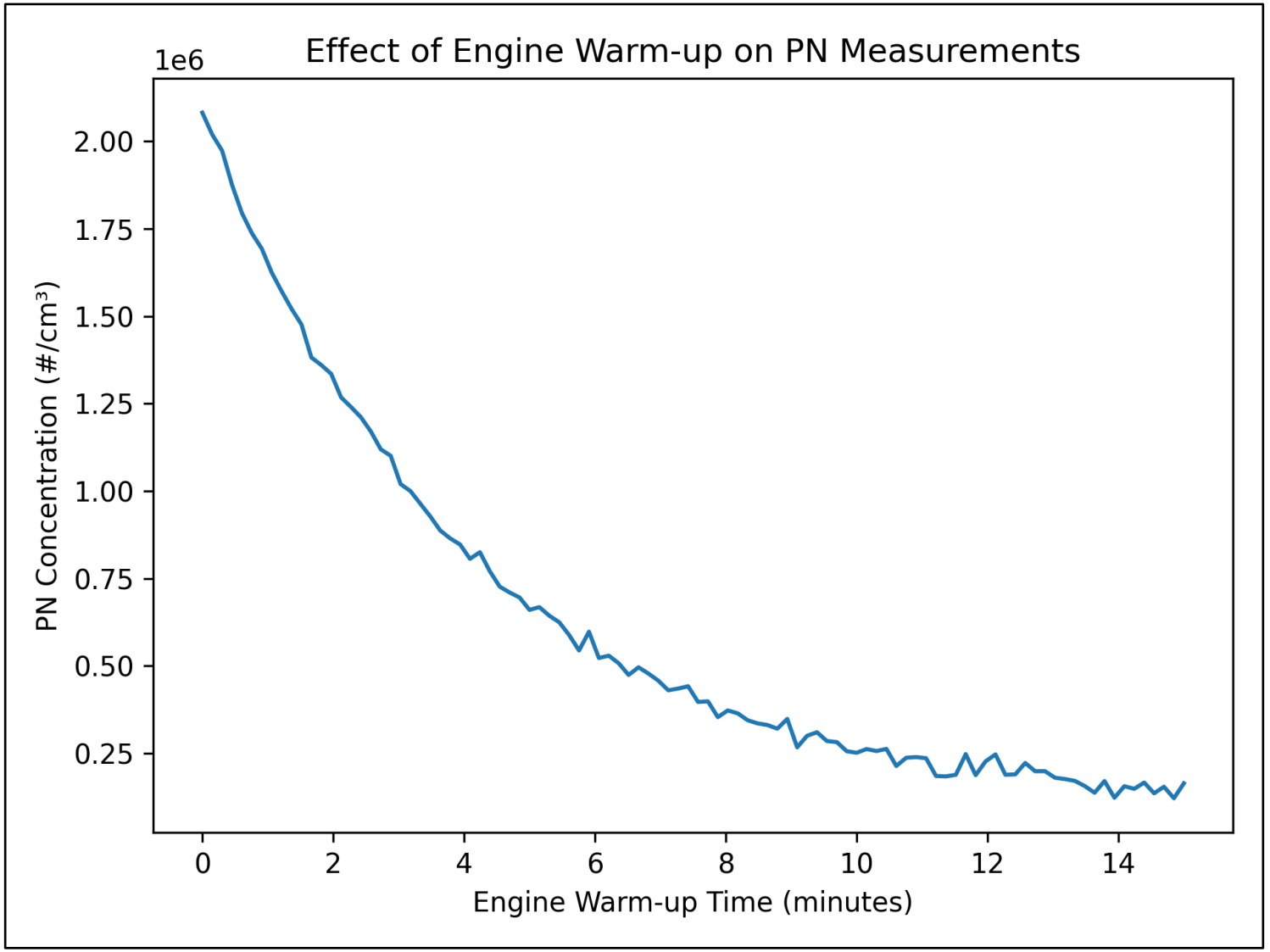
<1%

*After almost 4.000.000 of inspections with PN counting technologies in Flanders (north of Belgium)

Evolution of PTI Emission Testing



Evolution of PTI Emission Testing



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Future of Environmental Protection in PTI

- **PN for Petrol Engines**
  - Lower particle emissions than faulty diesel vehicles
  - Higher measurement sensitivity required
  - Larger influence of cold start effects

- **NOx-PTI**
  - Requires engine warm-up to reach stable conditions
  - Sensitive to aftertreatment system performance (e.g. SCR)
  - Challenge: accurate results depend on proper thermal state

- **OBM (Euro 7)**

Future of Environmental Protection in PTI

Strengthening Collaboration Between Key Stakeholders

- Governments, manufacturers, and PTI agencies must **share emissions data in real time**.
- **Harmonization of regulations across regions** to prevent vehicle manufacturers from exploiting weaker laws.
- Cross-border initiatives, like **EU-wide emission databases**, should be expanded globally.

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Conclusion & Call to Action

- **Type approval and periodic technical inspections (PTI) are essential tools for emission control.**
- **PN-PTI represents one of the biggest advantages of pollutants emissions control in PTI.**
- **Best practices demonstrate that better integration of approval and PTI reduces real-world emissions.**
- **It is not realistic that vehicle approval intends to keep vehicles clean through their whole life only with manufacturer requirements, and PN-PTI is the best proof of it.**

Thank you for your attention!

Alejandro Checa
CITA Technical Director
a.checa@citainsp.org

www.citainsp.org
Rue du Commerce 123 - 1000 Brussels, Belgium
+32 (0)2 469 06 70
secretariat@citainsp.org