

Mobile Emissions

New and recent developments in the Netherlands

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Current topics for Dutch emission factors



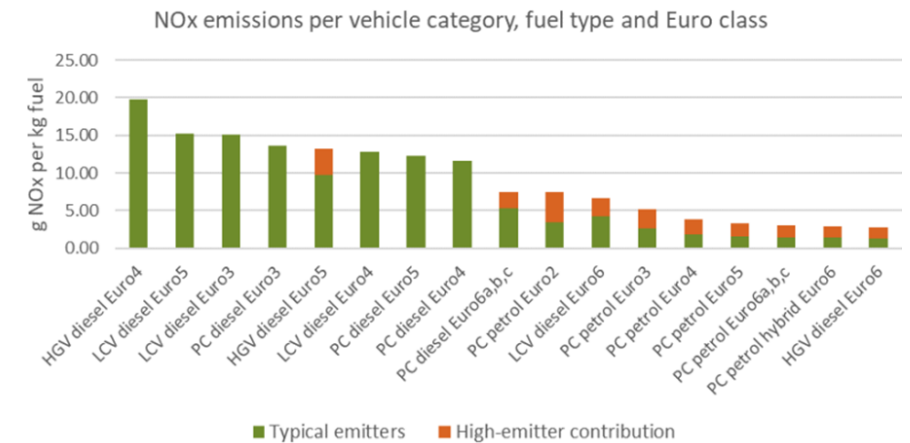
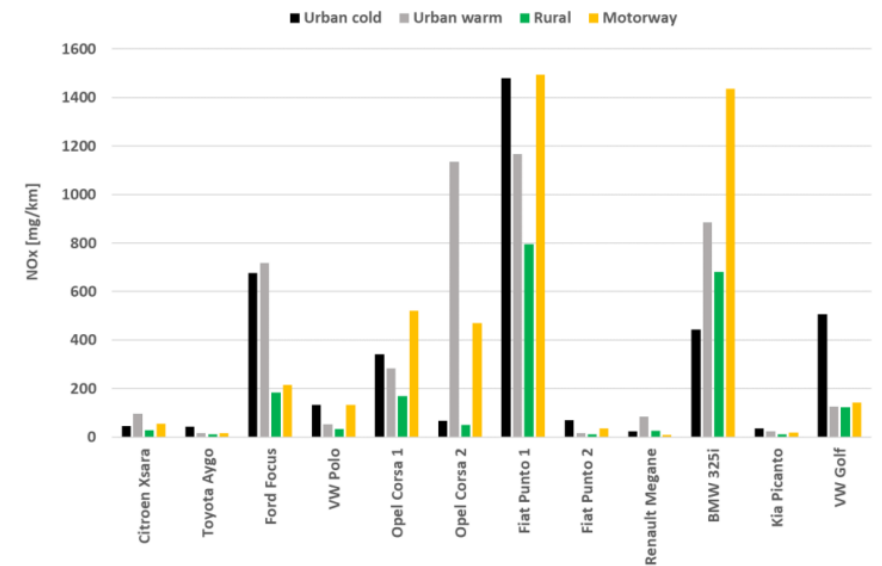
1. Quantifying deterioration effects
2. Replacement and sport catalysts
3. PTI effectiveness
4. High urban emissions of modern trucks
5. Mobile machinery emissions
6. Inland shipping monitoring
7. Particles emission factor (incl. volatiles, etc.)
8. Comparing sources for policies
9. Driving behaviour, non-regulated pollutants
10. Fuel quality affecting emission levels

Increasing emission contribution of older vehicles

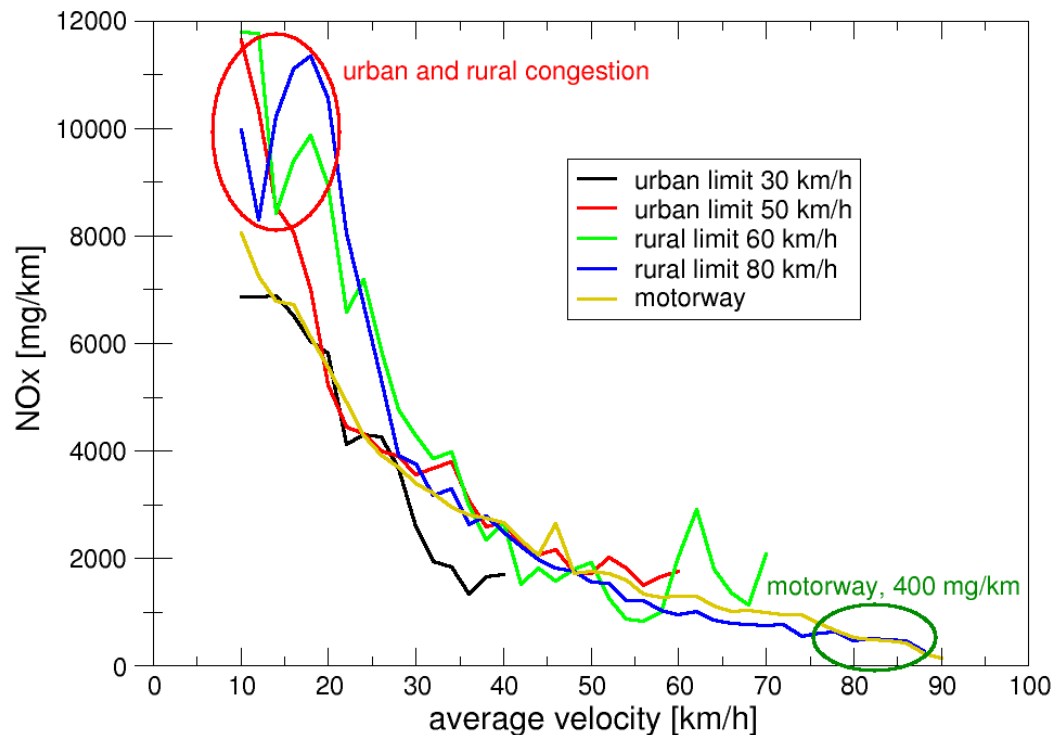
- Estimated that 6% of the older petrol vehicles have a defective TWC system and are responsible for about half the NOx emissions of petrol vehicles.
- When TWC catalysts are stolen, replacement catalysts are typically inferior quality.
- Sports catalysts (more noise and power) lead to increased emissions.

Current PTI tests do not detect any of these problems:

- Development of PTI testing and screening
- Development of sniffer car to quantify better the fraction of vehicles with defects and their impact



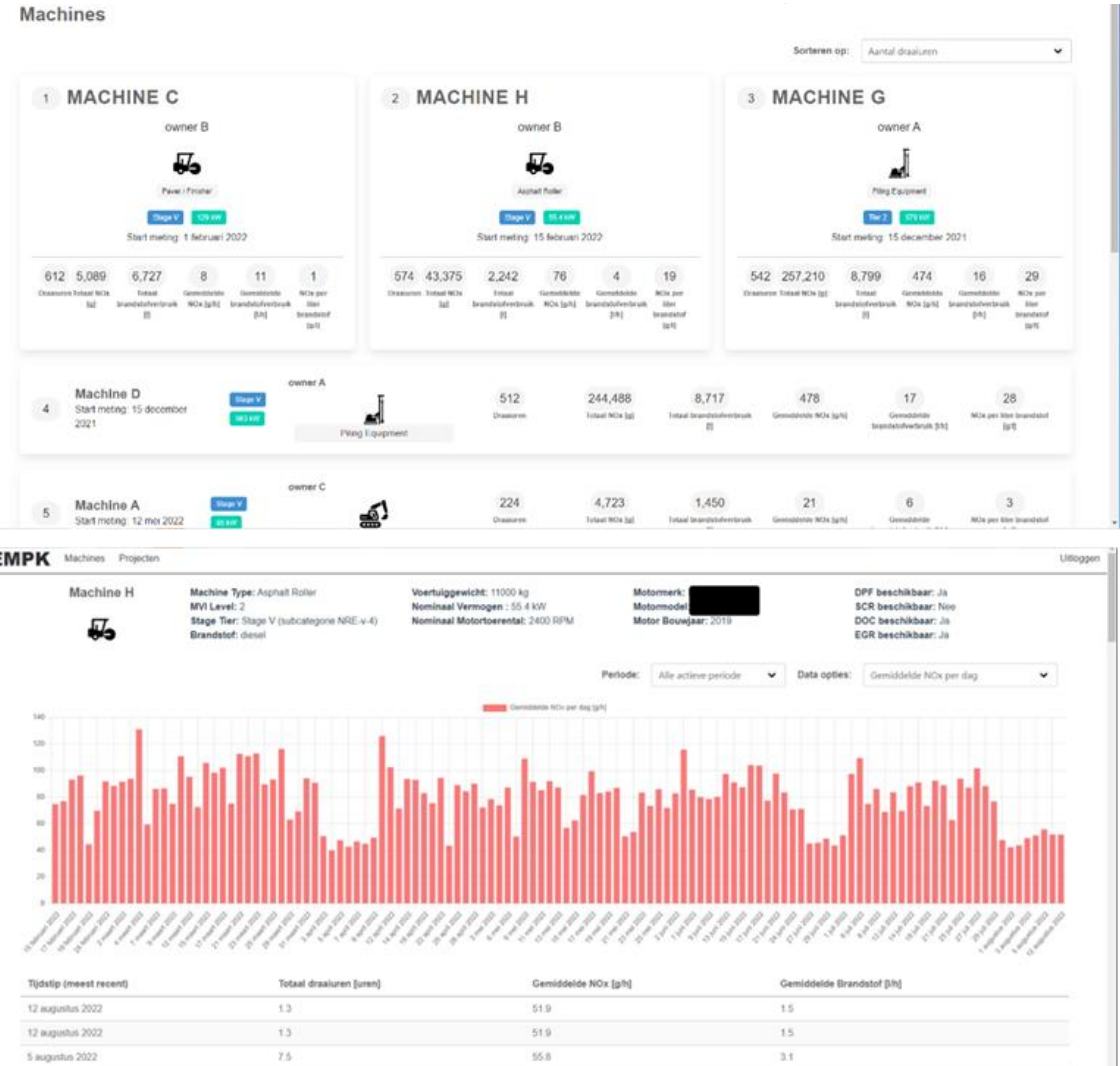
Differences in European emission factors



- Urban heavy-duty vehicle usage from monitoring data shows a different picture than testing.
- Euro-VI heavy duty trucks still have very high NOx emissions in urban environment.
- Current ISC PEMS tests do not cover these normal vehicle operation, due to power demand requirements, duration, and evaluation procedures.
- Other emission factors seem to underestimate truck emissions in congestion (and therefore did not identify this problem to be addressed in Euro-7)

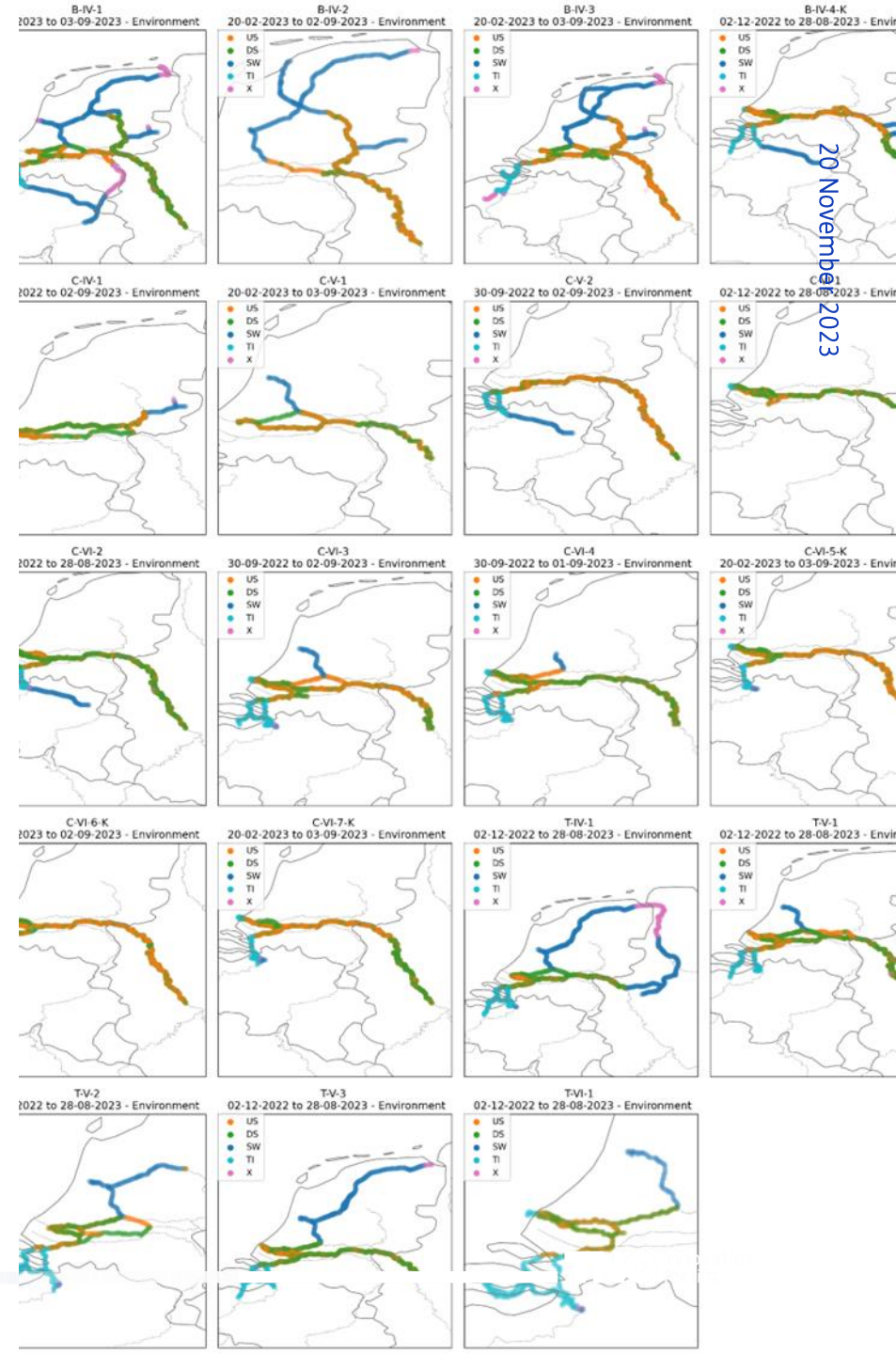
Mobile machinery monitoring

- Mitigation measures for emissions associated with construction projects, including PTI-like tests and inspection.
- Emissions and usages monitoring of mobile machines, off-shore construction ships, rail machinery, etc.
- Emissions vary greatly with machines and usages. NOx levels from 0.2 to 5 times the NRMM limits are observed in normal use.
- Low load operation, small machines (<56 kW) and big ones (>560 kW) are the remaining problems for the future.



Inland shipping with lagging legislation and older ships

- Monitoring data show the complex dependencies on water levels, currents and ship sizes and cargo.
- Installed power is often high compared to usage, with high engine losses and SCR temperature problems.
- Renewal rates of ships is low, and current fleet will impact the air quality for decennia to come.
- Current CO2 emission factors (e.g., GLEC framework) underestimate the real-world emissions typically by a factor 2.



Literature (from 2022-2023)

- [Approaches for detecting high NOx emissions of aged petrol cars during the periodic technical inspection | TNO Publications](#)
- [Real-world fuel consumption and electricity consumption of passenger cars and light commercial vehicles - 2021 | TNO Publications](#)
- [Emissiefactoren wegverkeer 2023 | TNO Publications](#)
- [On-road emissions of light-duty petrol vehicles and characterisation of driving behaviour | TNO Publications](#)
- [Real-world evaluation of WBA limits in urban driving | TNO Publications](#)
- [Dutch In-service Emissions Measurement Programme for Light-Duty Vehicles 2021 and status of in-vehicle NOx monitoring | TNO Publications](#)
- [Dutch In-service Emissions Measurement and Monitoring programme for Heavy-Duty vehicles 2021 | TNO Publications](#)
- [Methods for calculating the emissions of transport in the Netherlands | TNO Publications](#)
- [High Mileage Emission Deterioration Factors from Euro 6 Positive and Compression Ignition Vehicles | TNO Publications](#)
- [Pilotproject Emissie Monitoring en Periodieke Keuring \(EMPK\) van bouwmachines | TNO Publications](#)
- [Analysis of the emission performance of the vehicles tested for the Green Vehicle Index \(GVI\) project | TNO Publications](#)
- [Update of the Netherlands list of fuels in 2021 | TNO Publications](#)
- [Petrol fuel quality and its effect on the vehicle technology and the environment | TNO Publications](#)