A vertical yellow corrugated metal container is shown against a clear blue sky. The container has a small rectangular vent or sensor on its side. The image is partially obscured by a blue overlay on the right side of the slide.

Reducing Emissions from Cooling Units in Road Transport

89th GRPE session
Geneva, Switzerland

Presentation by The Netherlands

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Introduction



- › Sustainability is key
- › Good work on emission standards for cars and trucks
- › It makes no sense to only focus on trucks if a substantial part of the harmful emissions comes from something else: cooling units

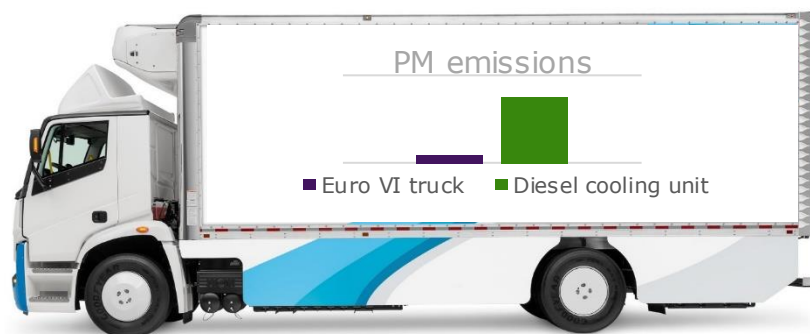
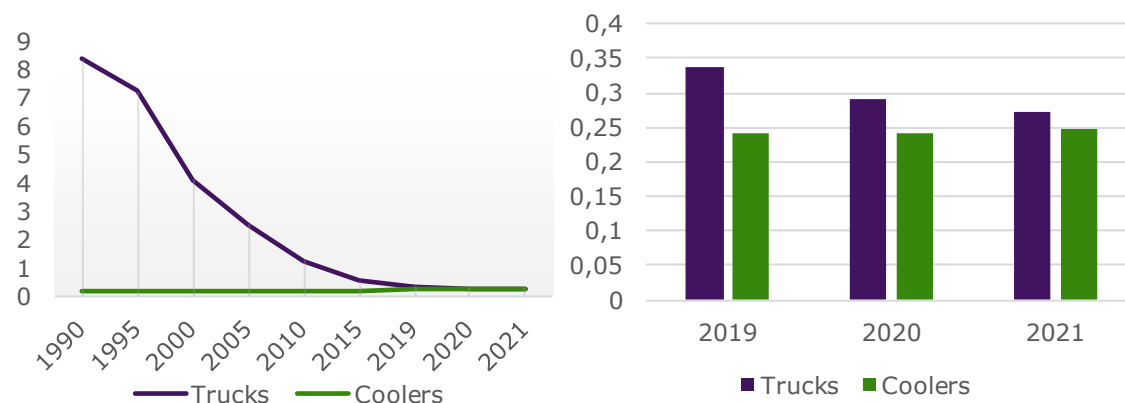
Background



- > Cooling units are attached to about **20%** of the total HD-fleet, a large share of them <19kW
- > Most cargo also must be actively cooled when the truck is not in use
- > Deployment of cooling units often in urban areas
- > Renewal ratio of cooling units lower than trucks

Data – PM

Total PM emissions NL (kton/year)



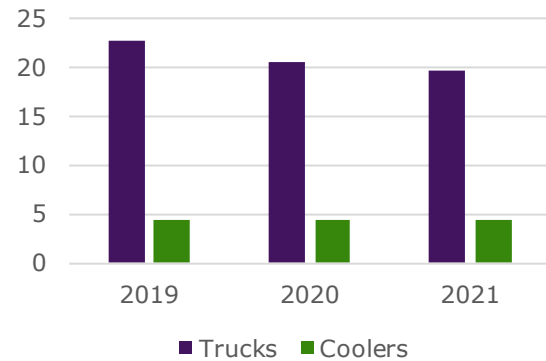
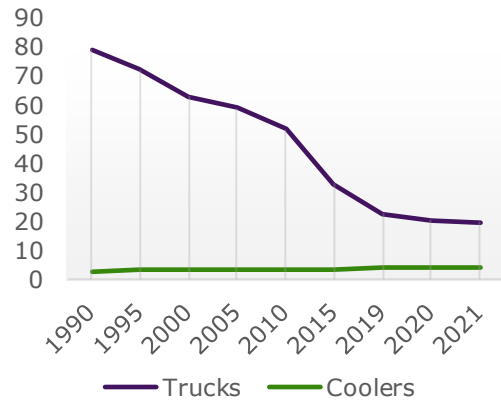
- > Total particulate matter emissions from cooling units are about the same as total PM emissions from trucks (with only 20% equipped)
- > Indications that a diesel cooling unit <19kW on road transport on average emits **5-10 times the PM** of a Euro VI diesel truck*

Sources: <https://www.emissieregistratie.nl/>,
TNO report 2021 R10221 - Real-world emissions of NRMM
TNO report 2022 R10375 - Dutch In-service Emissions Measurement and Monitoring HDV
Zemo Partnership - Emissions Testing of Two Auxiliary Transport Refrigeration Units

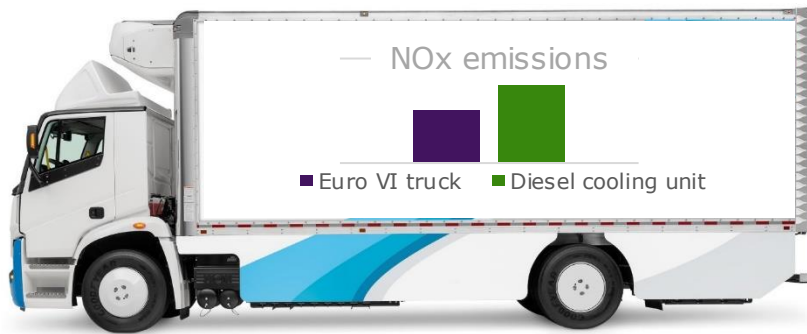
*Comparable to UNR 49-06 series of amendments

Data – NOx

Total NOx emissions NL (kton/year)



- > Total NOx emissions of cooling units are about **25%** of total NOx emissions from trucks
- > Indications that a diesel cooling unit <19kW on road transport on average emits **1,5 times the NOx** of a Euro VI diesel truck*



Sources: <https://www.emissieregistratie.nl/>,
TNO report 2021 R10221 - *Real-world emissions of NRMM*
TNO report 2022 R10375 - *Dutch In-service Emissions Measurement and Monitoring HDV*
Zemo Partnership - *Emissions Testing of Two Auxiliary Transport Refrigeration Units*

*Comparable to UNR 49-06 series of amendments

Effects and policy



- > Highly **concentrated** emissions in city centers, while loading and unloading
- > Difficult to measure, registration not standardized
- > Harmful health effects require further research, but expectations are high

Next steps



- > Reducing emissions for cooling units on road transport
- > Alternatives are available, new solutions should be cost-effective
- > We appreciate any data or studies around emissions of cooling units
- > Are there initiatives or ideas from contracting parties?
- > Future informal working group/task force?

Innovations



- › Be inspired by possibilities
 - Hybrid system (less diesel usage)
 - Fully electric systems
 - Regenerative braking on trailers for cooling and propulsion
 - Solar panels
 - Insulation of cooled compartments

A yellow corrugated metal container, likely a shipping container, is shown against a clear blue sky. The container has a vertical ribbed texture and a small rectangular vent or sensor on its side. The top edge shows a metal frame with a circular opening.

Conclusion

- › Strong indications that cooling units <19kW have excessive PM and NOx emissions compared to new diesel trucks
- › Do you have any data or reports available?
- › Are there initiatives or ideas from contracting parties?
- › Reduce emissions, stimulate innovations, and have a positive impact on our environment and our world!