ENCOURAGING THE REALIZATION OF A MODERN FLEET,
ENHANCING NAVIGATION SAFETY AND FOSTERING INNOVATIONS
Fifty-fifth session of the Working Party on the Standardization
of Technical and Safety Requirements in Inland Navigation (SC.3/WP.3)
Geneva, room XXII
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Modernization of engines in the road transport sector

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for Harmonization of Vehicle Regulations

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The World Forum for Harmonization of Vehicle Regulations (WP.29)

- UNECE Sustainable Transport Division: secretariat to WP.29 for more than 60 years
- WP.29 is:
  - the unique worldwide regulatory forum for the automotive sector
  - administrating three Multilateral UN Agreements

Certification regulations

1958 Agreement – Type Approval Regulations with mutual recognition of the type approvals

1998 Agreement – Global Technical Regulations

In Use PTI regulations

1997 Agreement –Periodical Technical Inspections of Wheeled Vehicles and the Reciprocal Recognition of Such Inspection

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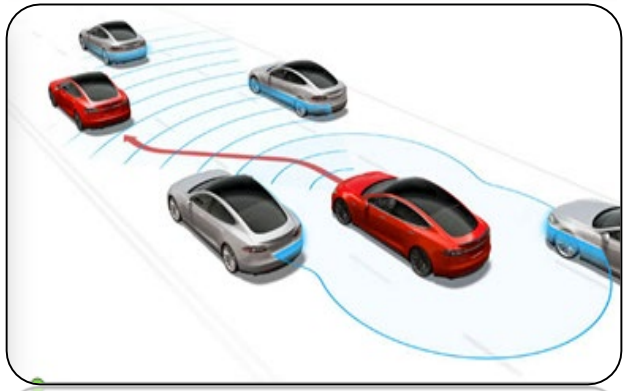
What is WP.29 doing?

Emissions of pollutants and CO_2

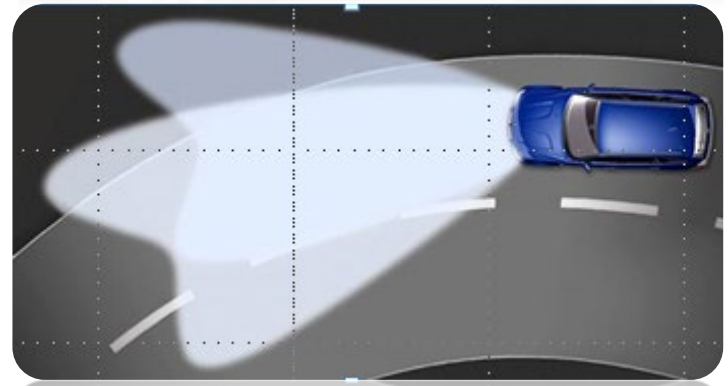
General safety

Passive safety

Noise and tyres



Automated/autonomous and connected vehicles



Lighting and light signalling

Air pollution and climate impact from vehicles : UNECE WP.29 regulatory work

- Exhaust emissions contains gaseous and solid particulates having an impact on:
  - Air quality => SDG 3
  - Climate and greenhouse effect => SDG 13
- Pollutant emissions covered since the 1970s
  - Emissions limits on given test => UN Regulations Nos. 49, 83, 96 / UN GTRs Nos. 2, 4, 11, 15
- CO2 emissions looked at more recently
  - Corporate average targets => UN Regulation No. 101 / UN GTRs Nos. 2, 4, 11, 15

Techniques to improve emissions from trucks

- To reduce air pollution:
  - EGR, SCR, DPF: engine and after treatment technologies to reduce harmful emissions of NOx, particulates, CO, HC
- To reduce GHG emissions:
  - Engine and also vehicle technologies

Source: DAF

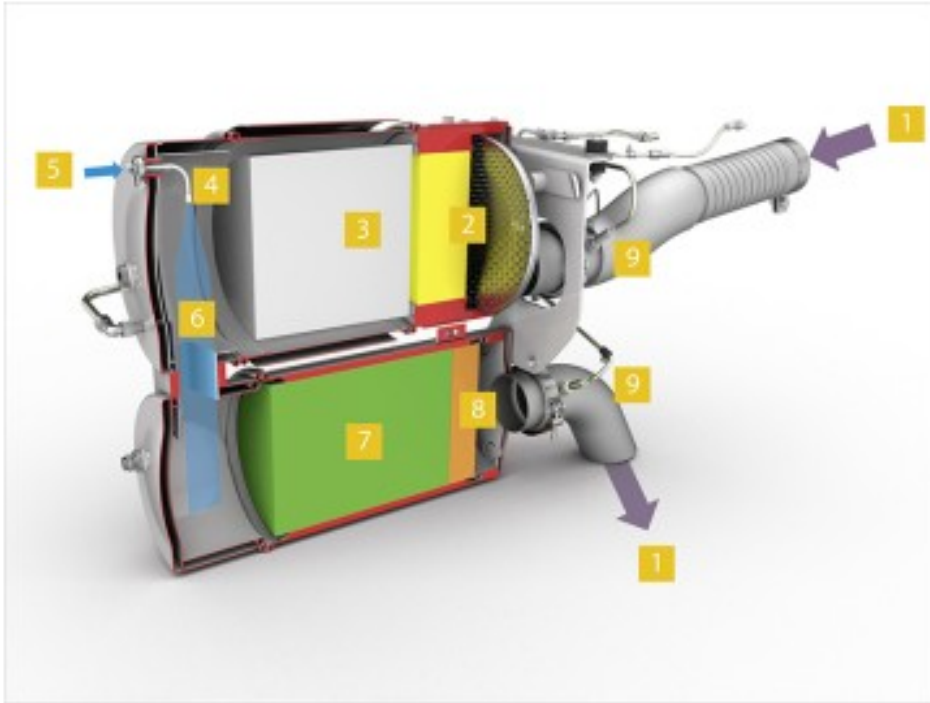
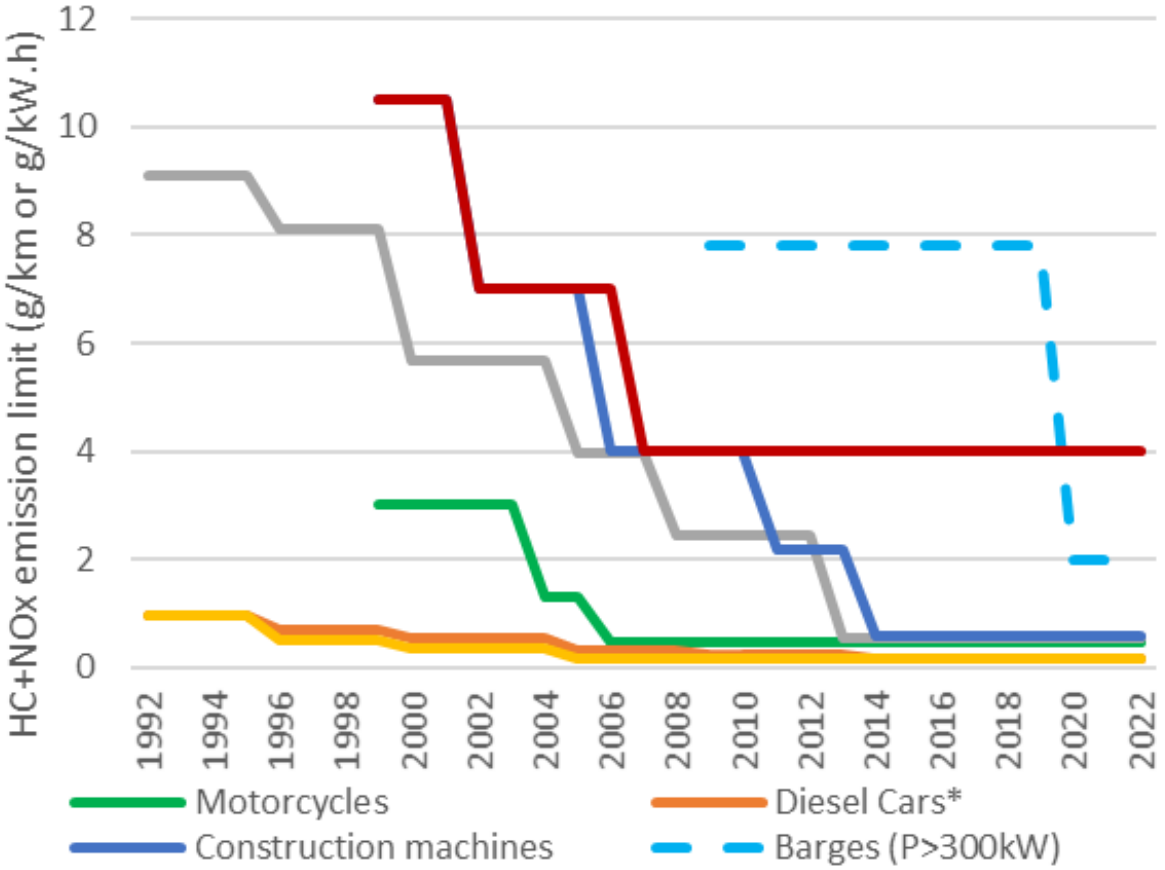


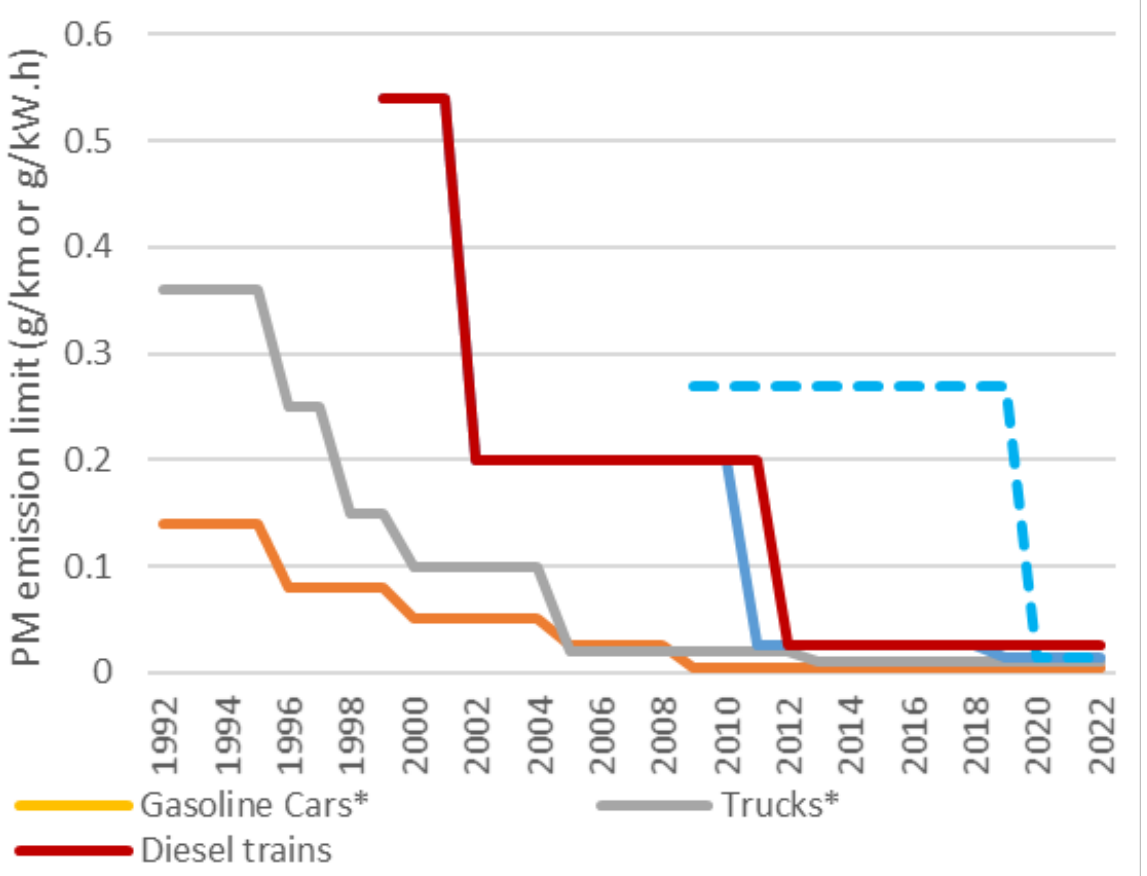
Fig.: Cross-section of exhaust silence in a city bus equipped with SCRT [1] Stream of exhaust gas [2] Diesel-oxidation catalytic converter [3] Closed particulate filter [4] Injection of AdBlue® [5] AdBlue supply line [6] AdBlue® conversion tract [7] SCR catalytic converter module [8] Ammonia-blocking catalytic converter [9] NOx sensors

Source: MAN

Emission limit evolution by vehicle type

- Emission limits shows good improvement over time for all applications
  IWVs improvements delayed but significant (Based on EU legislation)





*: emission limits similar to UN Regulations Nos. 49 and 83

Policies in place – emissions tests

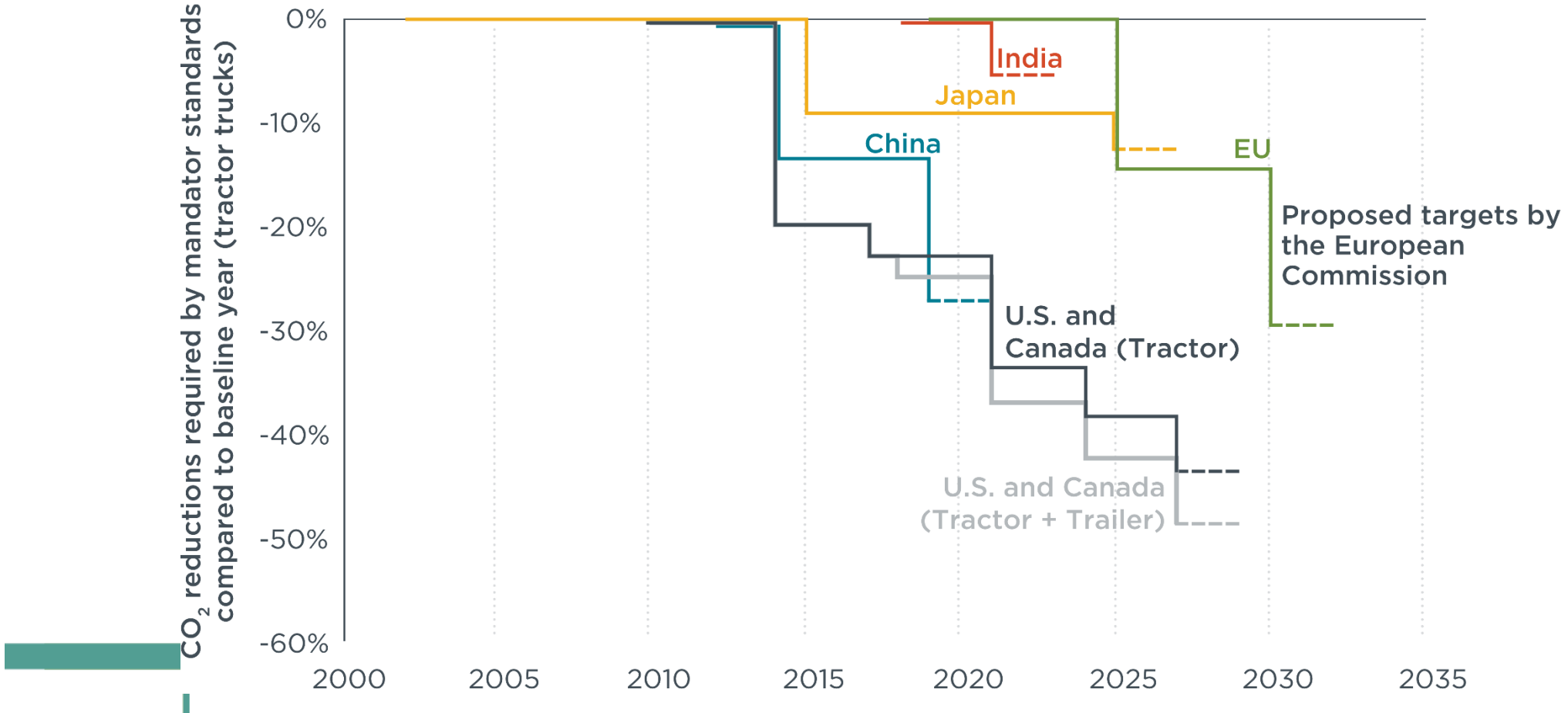
- Air pollution: selected test conditions differences (EU tests)

	Trucks*	Inland Water Vessels
Emission test	Engine only on laboratory	Engine only on laboratory
Real life test	Laboratory, engine only test now complemented with on-road tests using PEMS: In service conformity	In Service Monitoring for certain NRMM categories; Pilot projects for IWV ?
Conformity factor	1.5	(2.0, control area)
Durability	700 000 km / 7 years	10 000 hours

*: procedure similar to UN Regulation No. 49

Policies in place – GHG emissions

- In many regions across the globe, trucks CO2 emissions are regulated:
  - China, Japan, India, USA, and EU since 2019 have CO2/ Fuel efficiency standard for trucks



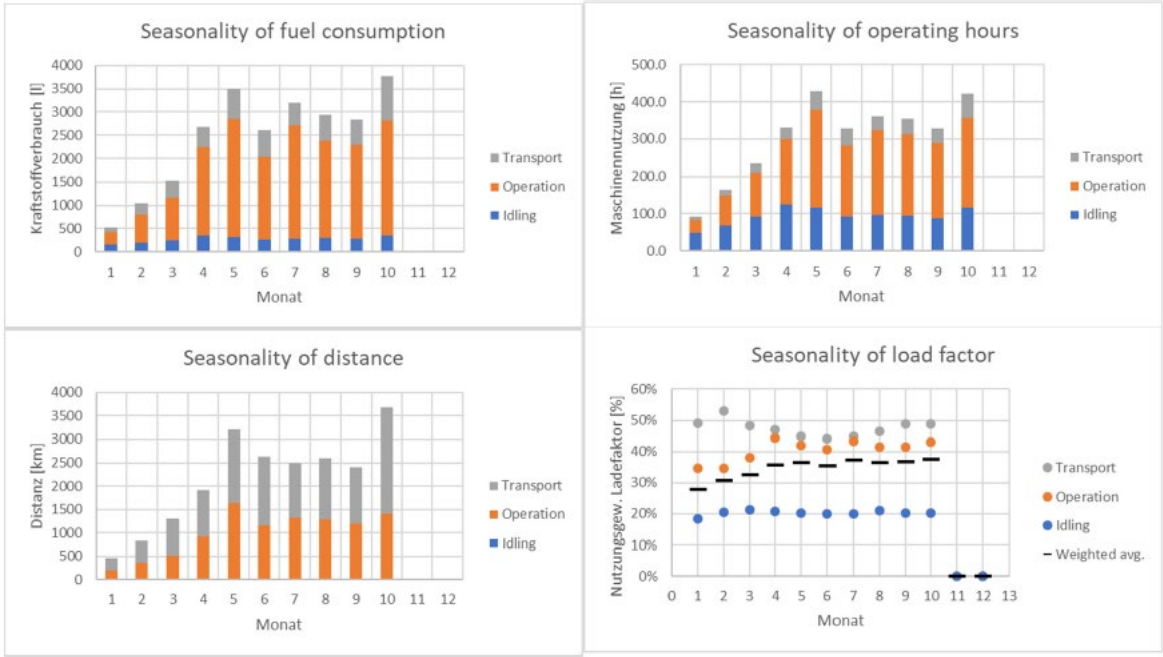
Source: ICCT

Considerations for energy efficiency / CO2 emissions for NRMMs

- EU Stage V introduced provisions on CO2 emissions from NRMM engines:

4. Manufacturers shall make available to OEMs the value of the carbon dioxide (CO_2) emissions determined during the EU type-approval process and shall instruct the OEMs to communicate that information, together with explanatory information on the test conditions, to the end-user of the non-road mobile machinery in which the engine is intended to be installed.

- Limited data availability of real-life CO2 from NRMM / IWVs at big scale
- E.g. research project on agricultural tractor in Switzerland



Conclusions

- Pollutant emissions control technologies commercially available at reasonable costs for all on-road / off-road applications
- IWVs catching up with on-road applications

- Limited knowledge and awareness on real life CO2/ energy efficiency from NRMMs / IWVs

- Share of CO2 emissions from NRMM (including IWVs) rising, considering the topic likely important in the near future

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Thank you

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