

AECC Test Programmes on RDE and WLTP

CARS 2020 Clean vehicles Working Group meeting
Brussels, 6 September 2013



Association for Emissions Control by Catalyst AISBL

Association for Emissions Control by Catalyst (AECC) AISBL

AECC members: European emissions control companies



Technology for exhaust emissions control for cars, buses and commercial vehicles, and an increasing number of non-road mobile machinery applications and motorcycles.



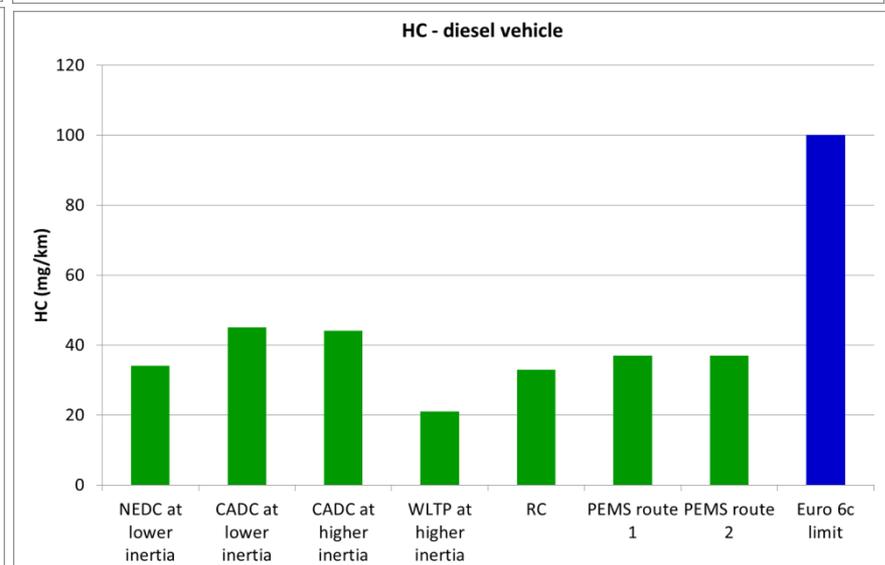
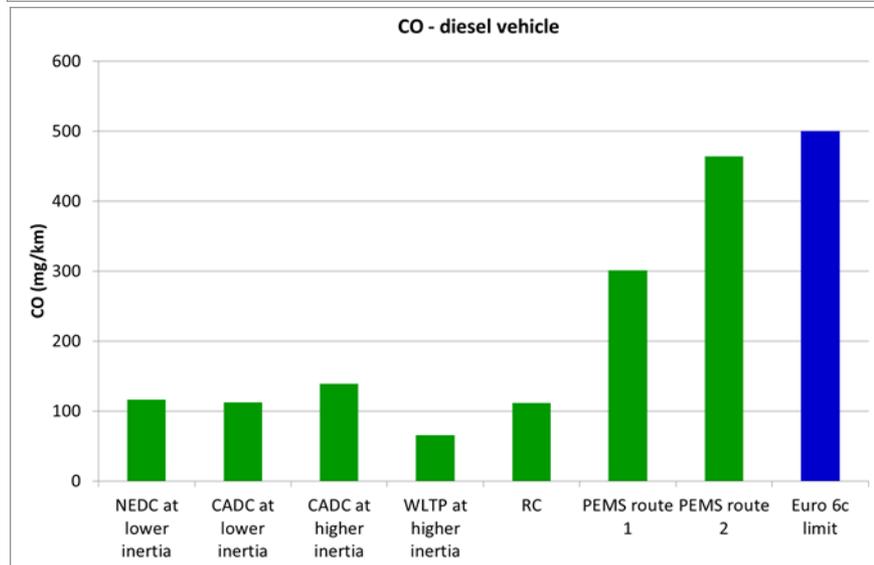
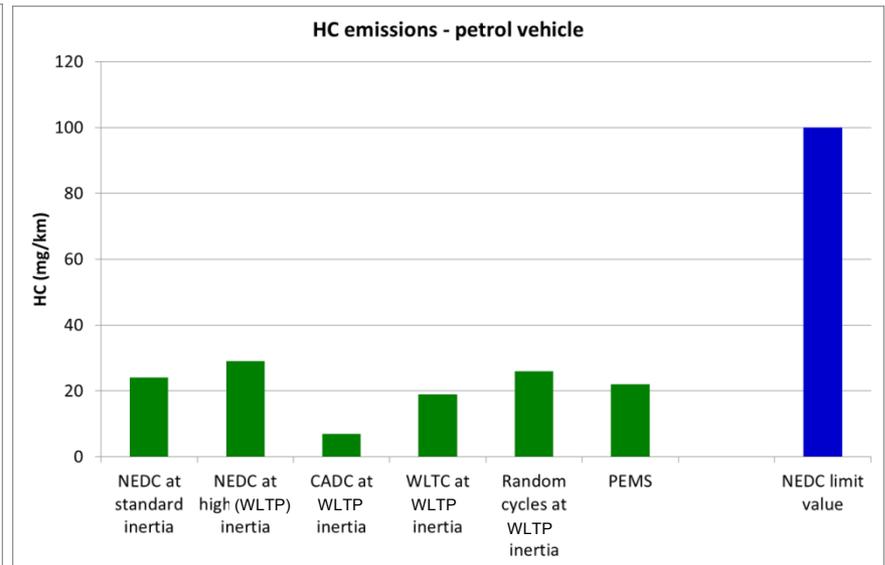
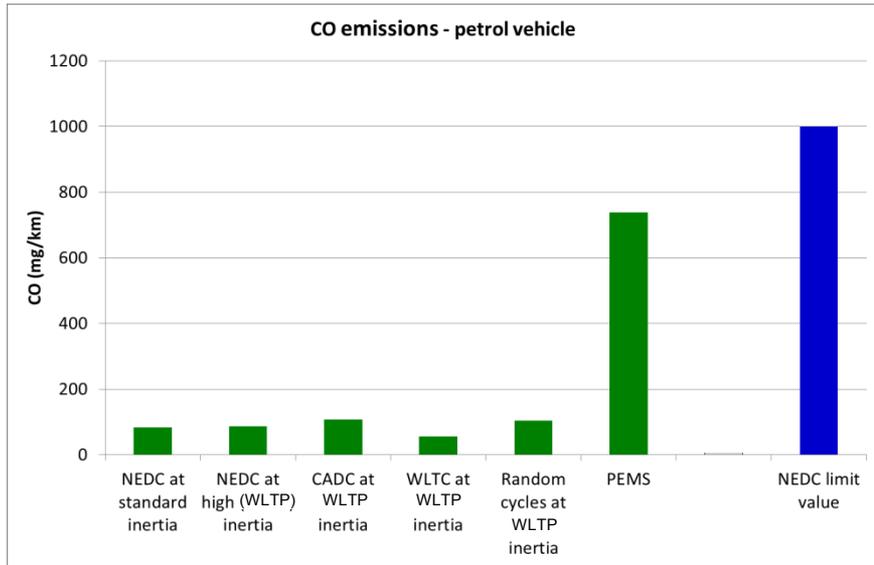
AECC test programmes

- AECC believes that the introduction of RDE requirements and WLTP will be important steps for future emissions control. To identify and understand the differences in emissions that may arise between these new methodologies and existing procedures, AECC has conducted some tests at independent laboratories on modern light-duty vehicles.
- Two vehicles have been tested to date
 - A 1.8 litre Euro 5b petrol vehicle
 - A 3 litre Euro 6 diesel vehicle
- The following slides show some initial results from this exercise. Fuller analysis is currently under way.
- The PEMS data shown is for the full test in all cases.

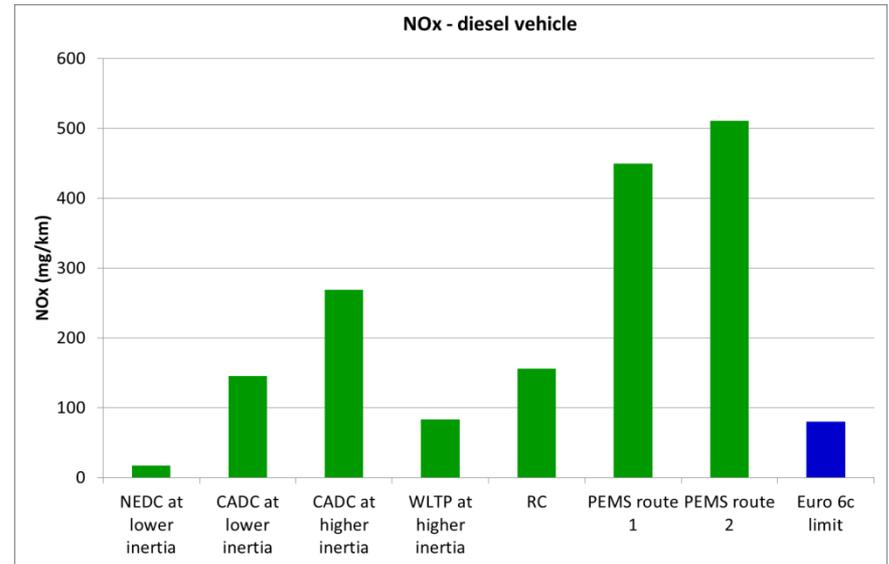
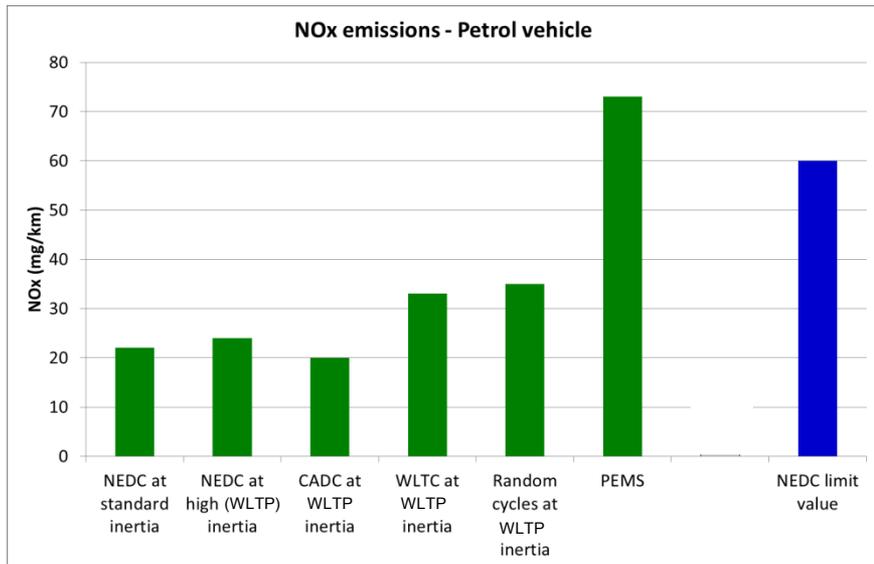
Tests conducted

- Chassis dyno
 - NEDC and WLTC cold-start tests
 - full cycle CADC hot-start tests
 - 3 different cold-start Random Cycles
 - Petrol vehicle: all chassis dyno tests were run at the WLTP inertia mass (340kg higher than NEDC inertia) with a single additional NEDC at standard inertia for comparison.
 - Diesel vehicle: NEDC and CADC chassis dyno tests were run at the standard (NEDC) inertia mass. WLTC and RC tests + a single CADC were run at the WLTP inertia (310kg higher).
- PEMS testing – gaseous emissions and soot
 - Petrol vehicle: 1 route (~21km city/~9 km rural/~16 km motorway)
 - Diesel vehicle: 2 routes. Route 1 same as petrol vehicle
Route 2 (modified version; ~16km city/6~km rural/~30km motorway).

CO & HC Emissions

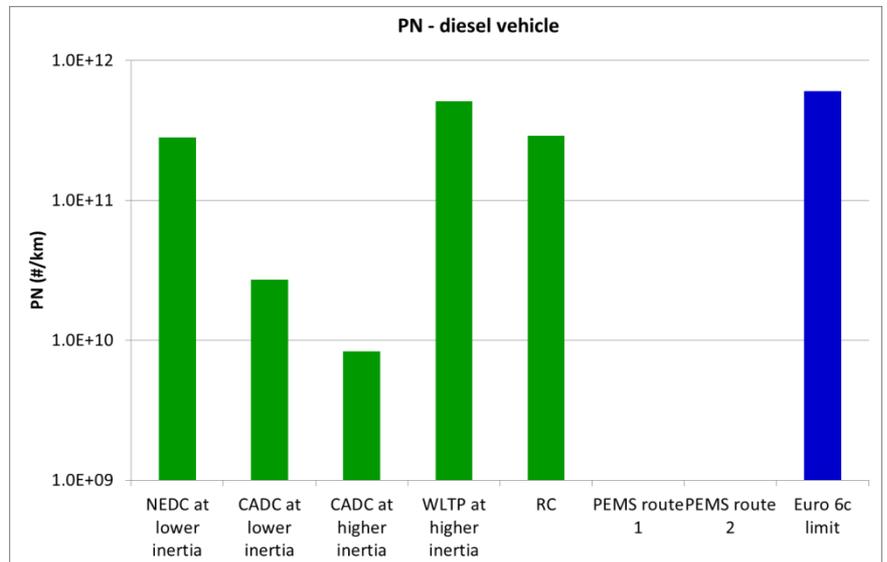
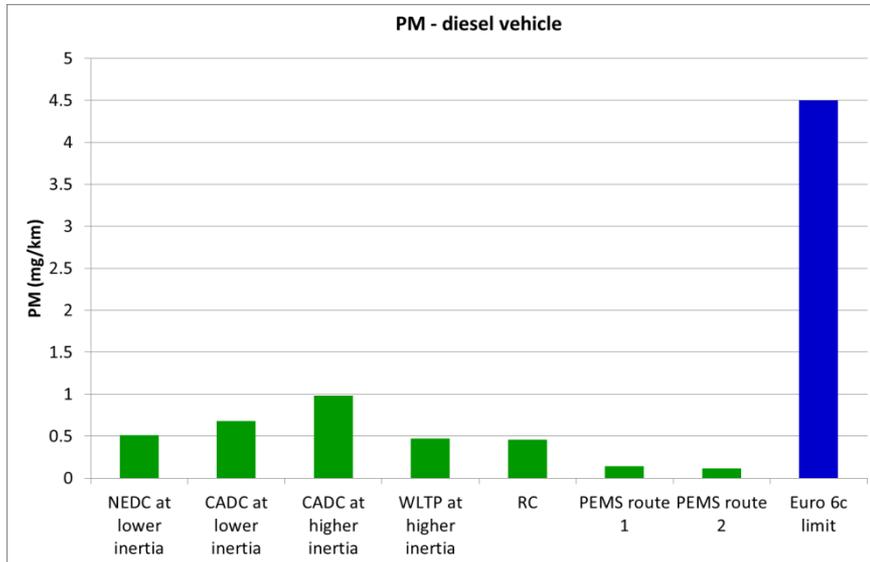
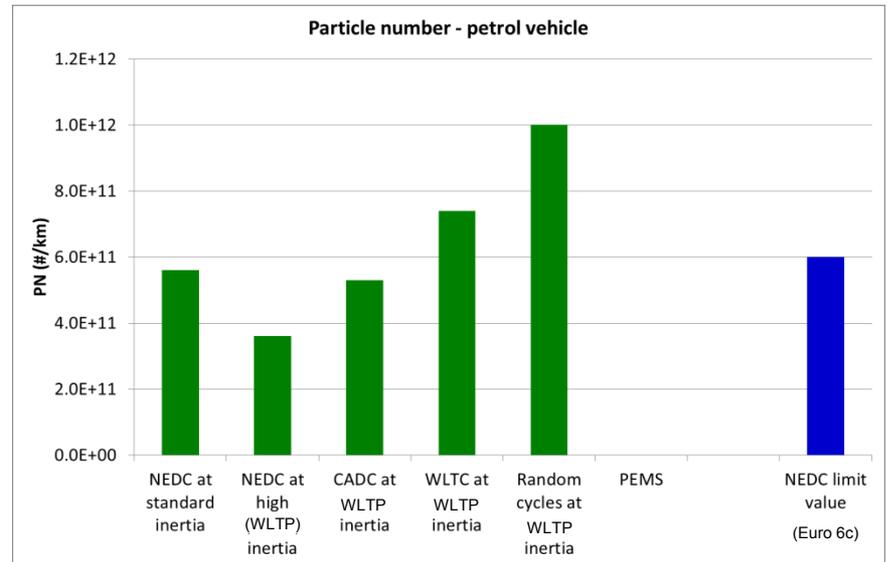
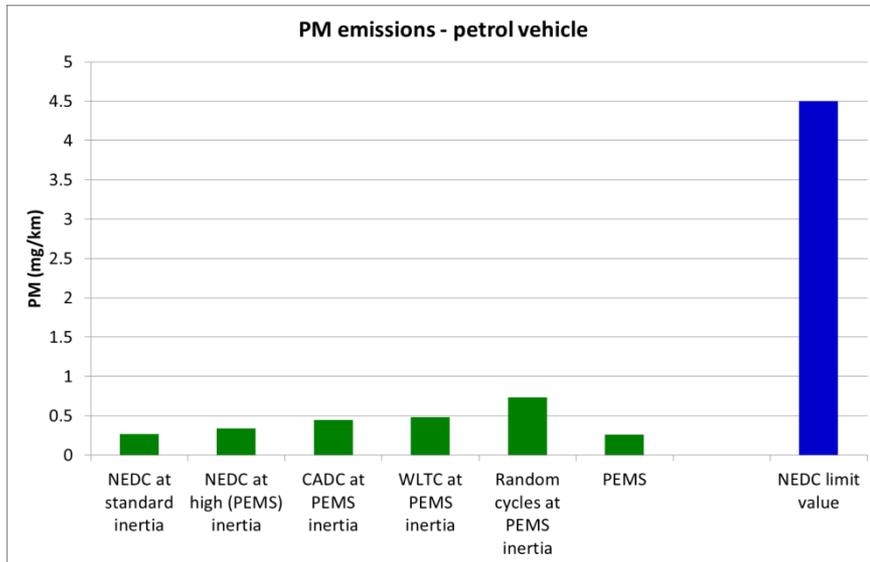


NOx emissions

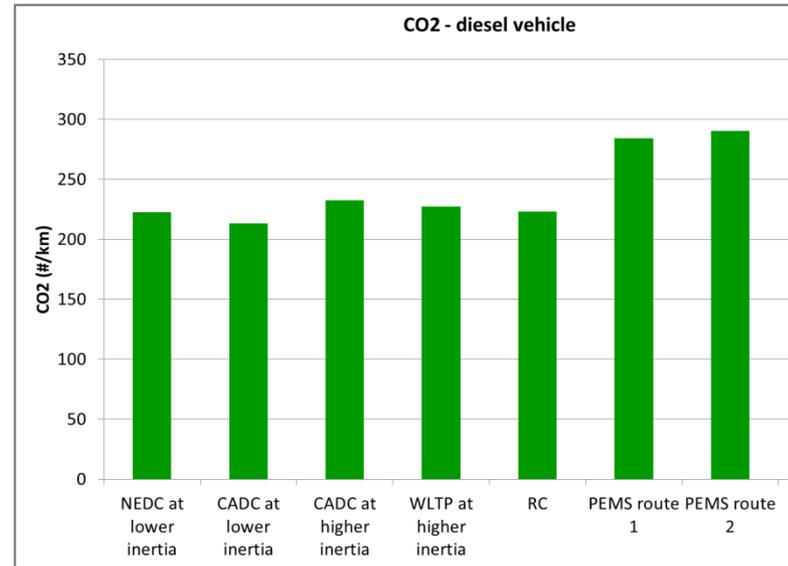
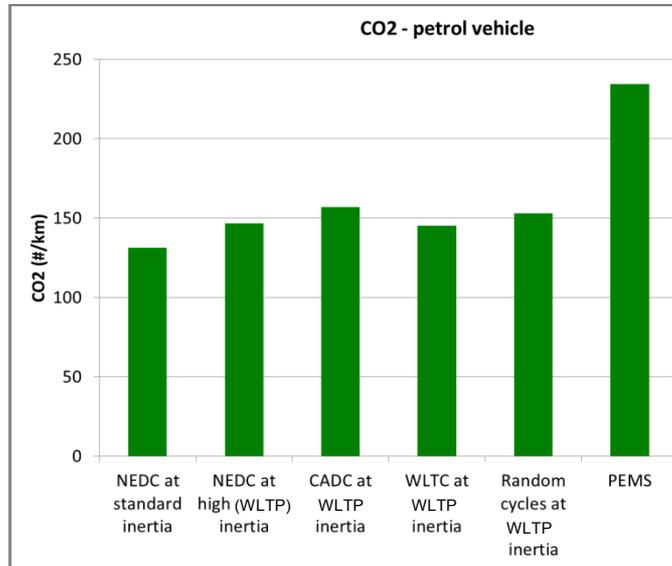


- For both vehicles the NOx emissions over the complete PEMS route were higher than those on any of the cycles.
- Nevertheless, for the petrol vehicle all chassis dyno results were below the NEDC limit for Euro 5/6, and even the PEMS emissions were still below 75mg/km.
- For the diesel vehicle, though, all results except the NEDC exceeded The Euro 6 limit, with the PEMS results as high as 500mg/km.

PM & PN emissions



CO₂ data



- The results indicate the effect of the higher inertia for WLTP, which appears to be more significant than the cycle itself.

Summary

- The two vehicles tested met the current CO and HC limits on-road and on all the chassis dyno cycles.
- For NOx emissions, the diesel vehicle exceeded the Euro 6 limit on all but the NEDC (with WLTC very close to the limit). On the PEMS routes NOx emissions were up to 500 mg/km.
- PM emissions for both vehicles readily met the limit values both on chassis dyno and in PEMS testing.
- The diesel vehicle met the PN limit on all tests. The petrol vehicle met the Euro 6b limit on all tests, but did not meet the Euro 6c limit on Random Cycles or WLTC. *Note PN was not measured on PEMS tests.*
- CO₂ data indicate the effect of the higher WLTP inertia.

Outlook

- AECC is active in both RDE and WLTP-EU working groups and supports the Commission's developments, including PEMS PM-PN.
- Further vehicles are being evaluated.



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Who are AECC and what do we do ?

AECC is an international non-profit scientific association of European companies making technologies for engine exhaust emissions control.

The members of AECC are companies operating worldwide in the research, development, testing and manufacture of key technologies for emissions control.

Their products are the ceramic and metallic substrates for catalysts and filters; autocatalysts (substrates with catalytic materials incorporated or coated); adsorbers; filter-based technologies to control particulate emissions from diesel and other lean burn engines; and speciality materials incorporated into the catalytic converter or filter.

Catalyst-equipped cars were first introduced in the USA in 1974 but only appeared on European roads in 1985 and in 1993 legislation forced their use on cars. Now more than 275 million of the world's 500 million cars and over 85% of all new cars produced worldwide are equipped with autocatalysts. Catalytic

What are the emission control technologies?

Exhaust gas contains carbon monoxide (CO), hydrocarbons (HC), nitrogen oxides (NOx) and particulate matter (PM). The main technologies used to treat exhaust to remove harmful gases and particles are:

- autocatalysts
- adsorbers (traps)
- filters

There are more details on the technology pages.



Thank you for your attention

