

## PRESS RELEASE

# DIESEL VEHICLES: THE NEWER, THE CLEANER

Industry opinion by the Association for Emissions Control by Catalyst (AECC)

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Today's press is full of news on diesel vehicles. Some information is technical; some based on emotions. As a technical association, AECC would like to review technologies increasingly used to make diesel vehicles clean.

The key message is: the newer the diesel vehicle, the cleaner; a new clean diesel is very different to older diesels. Diesel technology has evolved dramatically, especially with regards to its environmental impact. Modern, clean diesel cars combine a fuel economy and CO<sub>2</sub> advantage with near-zero emissions of ultrafine particles and nitrogen oxides, including NO<sub>2</sub>, providing the foundation to meet European air quality objectives. Air quality modelling indicates that new clean diesels allow EU air quality targets to be achieved; upcoming regulation ensures all new diesels will have significantly reduced real-world emissions. Any incentive encouraging replacement of older diesel with newer diesel vehicles will positively impact both climate and air quality.

Diesel cars today emit 15% less carbon dioxide (CO<sub>2</sub>) per kilometre than equivalent gasoline-powered vehicles. For that reason, they contribute to the CO<sub>2</sub> target car manufacturers have to meet in 2020 and beyond to mitigate greenhouse gas emissions from road transport.

Beside greenhouse gas emissions such as CO<sub>2</sub>, which impact climate change, all internal combustion engines emit pollutant emissions, in particular particulate matter (PM) and nitrogen oxides (NO<sub>x</sub>). If untreated, these harmful emissions have direct impact on human health and our ecosystem.

Since the early nineties, the EU has introduced increasingly stricter emissions limits for vehicles through a series of 'Euro' standards. The Euro 1 to 4 standards were increasingly stringent but did not require particle or NO<sub>x</sub> aftertreatment devices to be fitted to diesel cars. These older diesel cars are now contributing significantly to the air quality challenges European cities are facing.

Diesel technology has been and continues to be improved. European vehicle manufacturers and their suppliers lead in the development of diesel engine technology. The new generation of diesel engines is made up of a three-part system: highly efficient engine, ultra-low sulfur diesel fuel and advanced emissions control system<sup>1</sup>.

Technologies for removal of pollutants to meet the latest emissions limits in the real-driving environment are already available. The Health Effect Institute (HEI) concluded in 2015 from a comprehensive examination of emissions and health effects studies that, thanks to dramatic improvements in emissions, no significant health effects, especially cancers, have been demonstrated with modern diesel engines fitted with appropriate emissions control technologies<sup>2</sup>. Therefore, the concern raised in 2012 by the World Health Organization (WHO), who classified untreated diesel exhaust emissions as carcinogenic<sup>3</sup>, has been addressed by minimizing as much as possible diesel exhaust emissions to help improve the quality of the air we all breathe.

Mr Dirk Bosteels, Executive Director of AECC, said "*Diesel Particulate Filters (DPFs) were first introduced on some diesel cars 17 years ago. Since the implementation of the Euro 5 standard in 2011, 100% of new diesel cars in the EU have been fitted with a DPF. These filters remove 99.9% of the particles coming from the engine, including the smaller ultrafine particles. State-of-the-art DPFs use a wall-flow technology which operates from the engine start-up, virtually eliminating ultrafine particles from modern diesel car tailpipes*<sup>4</sup>."

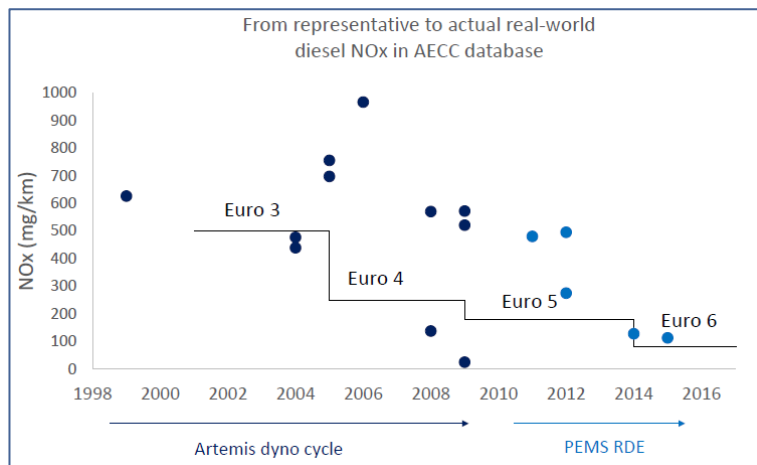
"*Since September 2015 the latest and most stringent standard, Euro 6, requires the addition of deNO<sub>x</sub> exhaust aftertreatment systems such as Selective Catalytic Reduction (SCR) and NO<sub>x</sub> traps to further reduce and control tailpipe NO<sub>x</sub> emissions of diesel cars*", Mr Bosteels continued.

Shortcomings in ensuring that emissions, particularly diesel NO<sub>x</sub> emissions, were controlled not only in the vehicle test laboratory on a specific drive cycle but also under real-world operating conditions became widely acknowledged.

AECC has been measuring off-cycle emissions of vehicles for more than a decade (see chart). First it was on the Artemis test cycle, which is more representative of real-world driving than the regulatory test cycle. Since 2012 it has then been with on-road tests where the vehicle is fitted with a Portable Emissions Measurement System (PEMS).

Diesel vehicles tested confirm that real-world performance did not always improve at the same pace as the Euro 3 to 5 NOx limits but overall a downwards trend is observed.

The Euro 6 standard has now been upgraded to account for Real-Driving Emissions (RDE) which will make sure deNOx aftertreatment technologies are used to their full potential, decreasing vehicle NOx emissions still further. This comes into effect from September 2017 onwards.



The EU automotive industry and its supply chain have continued to further improve emissions control of diesel vehicles and a number of Euro 6 diesel cars are now available on the EU market with very low real-world tailpipe emissions. In 2015 AECC contracted the consulting engineering company Ricardo to measure real-world emissions of a Euro 6 diesel rental car<sup>5</sup>; particles and NOx emissions were measured with a PEMS when the car was driven on a mix of urban, rural and motorway roads. Both particles and NOx emissions were below the Euro 6d limits showing clean diesel is already available to buy. Emissions Analytics, via their Equa index<sup>6</sup>, or ADAC, via their EcoTest<sup>7</sup>, provide lists of diesel models that are already clean and meet the Euro 6 NOx limit in the real-world. The list of Emissions Analytics shows 19 diesel car models with low real-world NOx emissions (A or B ranking).

This is only a start; with mandatory RDE requirements implemented as of September this year, all diesel cars will have to comply with more stringent regulation during real-driving. Technology for emissions control is available and clean diesel car models are available on the market. A lot is and will still change on the emissions of diesel cars.

Decisions on which vehicles are allowed or not to drive in cities should not just rely on the name of a technology – in this case “diesel” – but need to be based on the pollutant emissions that these vehicles produce. Only then will they contribute to accelerate the clean-up of the vehicle fleet and help improve urban air quality and lower CO<sub>2</sub> emissions.

More information and results from numerous emissions test campaigns are available from [www.aecc.eu](http://www.aecc.eu).

References:

- <sup>1</sup> [www.cleandieselttech.eu](http://www.cleandieselttech.eu)
- <sup>2</sup> [www.healtheffects.org/publication/executive-summary-advanced-collaborative-emissions-study-aces](http://www.healtheffects.org/publication/executive-summary-advanced-collaborative-emissions-study-aces)
- <sup>3</sup> <http://publications.iarc.fr/Book-And-Report-Series/Iarc-Monographs-On-The-Evaluation-Of-Carcinogenic-Risks-To-Humans/Diesel-Exhaust-2012>
- <sup>4</sup> [www.aecc.eu/wp-content/uploads/2016/08/110629-AECC-presentation-ETH.pdf](http://www.aecc.eu/wp-content/uploads/2016/08/110629-AECC-presentation-ETH.pdf)
- <sup>5</sup> [www.aecc.eu/wp-content/uploads/2016/08/150618-Integer-conf-AECC-RDE-Program-presentation-final.pdf](http://www.aecc.eu/wp-content/uploads/2016/08/150618-Integer-conf-AECC-RDE-Program-presentation-final.pdf)
- <sup>6</sup> <http://equaindex.com/equa-air-quality-index/>
- <sup>7</sup> [www.adac.de/infotestrat/adac-im-einsatz/motorwelt/ecotest\\_feinstaub.aspx?ComponentId=290529&SourcePagelD=6729](http://www.adac.de/infotestrat/adac-im-einsatz/motorwelt/ecotest_feinstaub.aspx?ComponentId=290529&SourcePagelD=6729)

Note for editors:

AECC is an international non-profit scientific association of European companies operating worldwide in the research, development, testing and manufacture of key technologies for emissions control. Their products are the ceramic substrates for catalysts and filters; catalysts (substrates with catalytic materials incorporated or coated); adsorbers; filter-based technologies to control engine particulate emissions; and speciality materials incorporated into the catalyst or filter. Members’ technology is integrated in the exhaust emissions control systems of cars, commercial vehicles, buses, non-road mobile machinery and motorcycles in Europe. More information on AECC can be found at [www.aecc.eu](http://www.aecc.eu).

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