

# PRESS RELEASE



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## **Achieving RDE NOx compliance in urban driving is possible, at a price, says Ricardo**

**A range of aftertreatment technology options are available to automakers seeking to achieve compliance with the impending EU Real Driving Emissions (RDE) regulations – according to the results of a Ricardo research project to be presented today at the SIA Powertrain international conference and exhibition being held in Rouen, France**

Future RDE emissions legislation and fleet average CO<sub>2</sub> targets represent a challenge for automakers wishing to provide cost-effective light duty diesel vehicles. But while the costs of implementation can be significant, a range of technologies is available which, applied in a combination and manner appropriate to needs of the vehicle, can deliver compliant performance in terms of both NOx and CO<sub>2</sub>.

Ricardo has previously reported on a simulation environment set up to enable the study of engine and after-treatment technology over RDE cycles, incorporating post-processing with the EMROAD and CLEAR tools. In the paper published today, Ricardo reports on the use of this simulation environment to further explore the challenge and capability of LNT-based solutions. Solutions were also tested on an engine dyno, providing steady-state test results to help understand the mechanisms involved, and provide input data for the simulation.

While the vehicles on which the research was based were representative of current production models at the more aggressive end of the downsizing spectrum in terms of engine capacity and output, but modelled with a future three cylinder 1.5 litre diesel engine. The drive cycles to which they were subjected exceeded the finally adopted RDE boundary conditions in the motorway phase, but nonetheless provide a useful indication of performance. The research shows that RDE legislation represents a significant challenge for light duty diesel manufacturers, and will require large steps in the



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application of existing technologies. While known technologies were shown to be capable of appropriate NOx control, they come with downsides to other product attributes, notably cost, reductant fill frequency where applicable, and ultimately, fuel consumption.

It is expected that application of exhaust thermal management to improve urban phase NOx control will see the combination of low pressure cooled EGR together with an oxidation catalyst and actively dosed combined SCR/DPF (SCRf) as an acceptable solution for both C-segment and SUV products. For premium applications where inter-service reductant fill would be unacceptable – or where two-stage boosting adds to the complexity of exhaust temperature control – the combination of LNT and actively dosed SCR is likely to be attractive.

“The introduction of RDE regulations in Europe represents a very significant challenge, particularly for those automakers offering light duty diesel products,” commented Ian Penny, managing director – engines business, Ricardo. “However, as the results of the research that we are publishing today demonstrate, this is a challenge that can be met in a cost-effective manner through the application of a combination of aftertreatment technologies appropriate to each vehicle type. We are pleased to be sharing the results of this work at the SIA Powertrain international powertrain conference – results that demonstrate that the requirements of RDE regulations can be met in future, light duty clean diesel products.”

In addition to the paper presentation, Ricardo is also exhibiting at the SIA powertrain conference. Notable amongst the exhibits will be the ADEPT concept vehicle, combining low-cost 48V, mild-hybrid technologies with the aim of reducing 1.5L Diesel C-segment CO<sub>2</sub> emissions by a further 15-20 percent, and showing a clear pathway to 70g/km. The ADEPT project is led by Ricardo in partnership with CPT, Ford, EALABC, Faurecia, the University of Nottingham, RedDeer, and Provector, and is supported by Innovate UK. Also on display is the Doosan DL06 Tier 4 final engine, which uses the Ricardo patented Twin Vortex Combustion System and achieves US Tier 4 final – Stage IV emissions with EGR and SCR, but no requirement for a DPF.

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**NOTES TO EDITORS:**

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