



REWARD

REal World Advanced Technologies foR Diesel Engines

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Project partners:

- 1 - AVL - AVL List GmbH - AT
- 2 - REN - Renault SAS - FR
- 3 - VCC - Volvo Car Corporation - SE
- 4 - CRF - CRF SCpA - IT
- 5 - CNRIM - Istituto Motori – Consiglio Nazionale delle Ricerche (CNR) - IT
- 6 - JM - Johnson Matthey Plc - UK
- 7 - RIC - Ricardo Plc - UK
- 8 - SCF - Schaeffler AG - DE
- 9 - LMM - Le Moteur Moderne - FR
- 10 - DELPHI - Delphi Automotive Systems Luxembourg S.A. - LU
- 11 - UNR - Uniresearch BV - NL
- 12 - IFPEN - IFP Energies Nouvelles - FR
- 13 - VIF - Virtual Vehicle Research Center - AT
- 14 - CTH - Chalmers Tekniska Högskola - SE
- 15 - CTU - Czech Technical University - CZ
- 16 - UPVLC - Universitat Politecnica de Valencia – Motores Termicos - ES

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Publishable Executive Summary

In the framework of REWARD, one work package developed a new low NO_x combustion concept for a 1.6L diesel engine. This is a typical engine for B/C class passenger cars. The new development pursues a cost competitive efficiency approach with improvements from the engine cycle, gas flow, friction, cooling and aftertreatment system.

The base engine is the RENAULT 1,6L R9M. This was improved by the new combustion concept but also by new components and techno bricks such as a new charging and charge air cooling (flexibility & efficiency), revised EGR systems (high / low pressure), fuel injection and a new exhaust gas aftertreatment concept.

The initially pursued non-urea aftertreatment system concept was changed after extensive investigations (by Ricardo and JM) in the first period of the project to a dCSCTM + SCR concept (dCSC stands for “Diesel Cold Start Concept”, a trade mark of JM. It is a passive NO_x storage catalyst).

The demonstrator vehicle is based on a RENAULT Kadjar MY 2015. After integration of the revised engine and aftertreatment system in the vehicle the calibration was carried out on chassis dynamometer and by on-road tests.

Finally, an independent testing institute assessed the demonstrator vehicle. The following results could be achieved:

- The REWARD emission targets could be met in on-road RDE vehicle tests.
- The fuel consumption targets, which were derived from (RDE compliant) on-road drives with the baseline vehicle and carried out on chassis dynamometer under reproducible conditions, also could be met.
- In the WLTC, the NO_x targets could be met, however, at a fuel consumption improvement of 3.1% (referred to the baseline vehicle). The fuel consumption target in the WLTC was to achieve 5% improvement.