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 - Instituto 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
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Publishable Executive summary

Engine air-loop layout has been chosen in order to provide the best brake specific fuel consumption (BSFC) with today available boosting devices. Alternative configuration were rejected (only turbocharger boosting, super-turbocharged configuration) after performing large amount of 1D simulations. Simulation tools were developed and preliminary testing of engine-vehicle-road (route) interaction have been performed.

Deliverable D4.2 describes each air-loop configuration and compares the simulation results. The high sensitivity of two-stroke engine to boosting devices efficiency, scavenging quality and engine backpressure is shown and taken into account. Recommendations for air-loop configuration and specifications of boosting devices are presented.

Turbo-supercharger layout is recommended, possibly with variable transmission ratio for a supercharger or electrically assisted supercharger drive. WG turbine offers better overall efficiency of an engine.

The air-loop optimization should be repeated after results from single cylinder engine are available. Optimization of the whole powertrain is possible using newly developed optimization tool for driving along a pre-defined route.