CORE –CO2 Reduction for long distance transport

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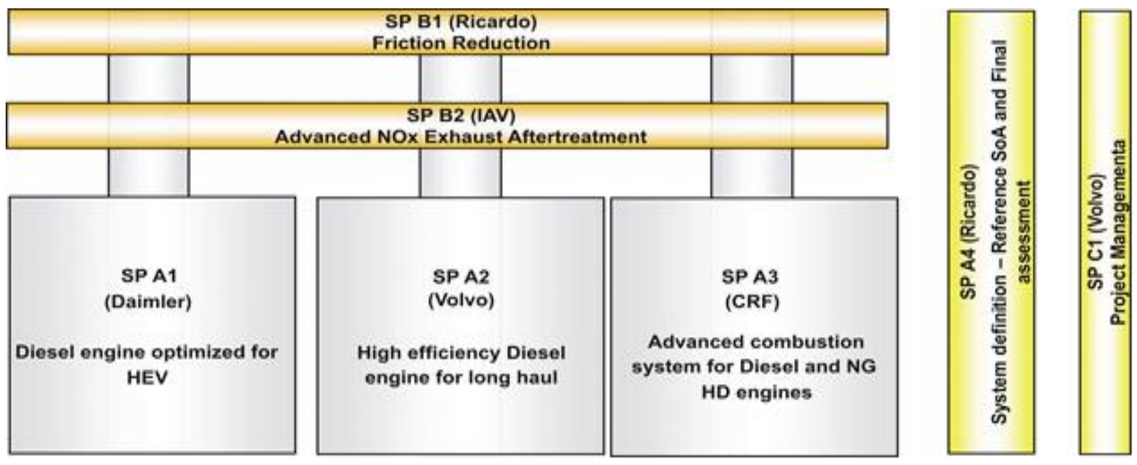
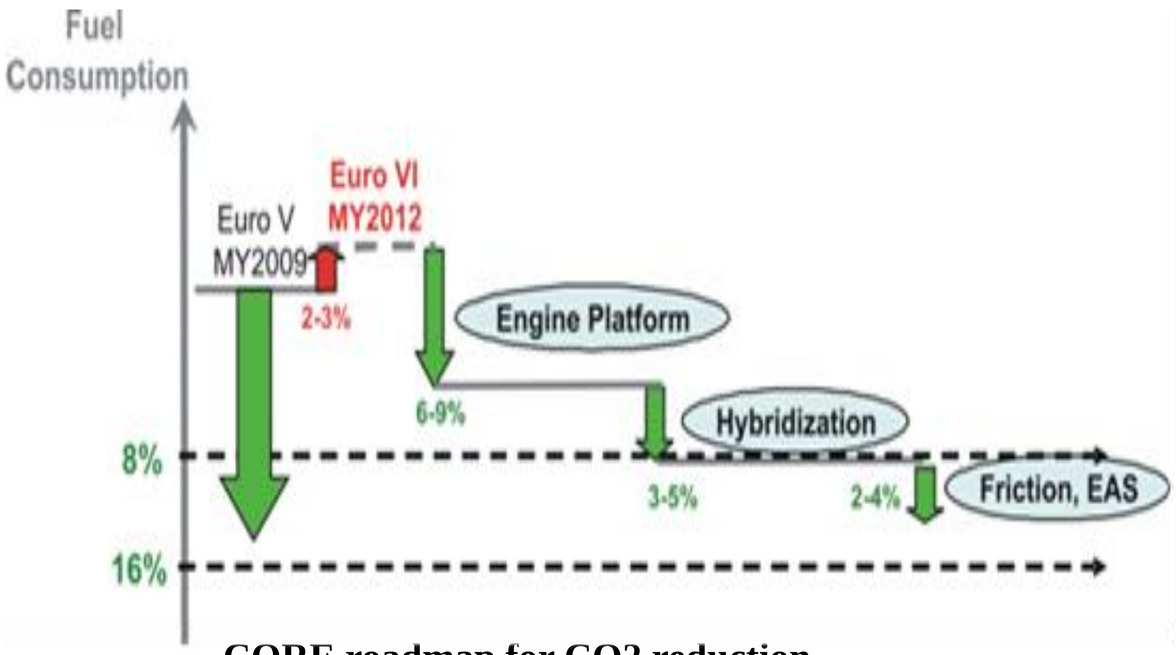
Introduction

European prosperity depends on a strong and competitive transport sector, and its contribution to wealth and integration is steadily growing. At the same time the transport system of Europe faces significant challenges in order to become sustainable in the long term.
With the aim to address these challenges the project CORE was started. CORE is a European founded project within FP7. The consortium consists of 16 partners from truck manufactories , automotive industries and universities; Volvo, CRF, Chalmers, Daimler, Federal-Mogul, Univ. Hannover, Honeywell, IAV, Johnson Matthey, JRC, Metatron, POLIMI, POLITO, Rhodia, Ricardo and Umicore.
The project has a duration of 4 year, with start January 2012 and end December 2015. The total budget is about 17 MEuro, with approximately 50% founded by European Commission.
CORE is divided into six sub-projects, three focusing on different engine and powertrain technologies, two cross sub-project with focus on friction and EATS, and a final assessment sub-project



Objectives

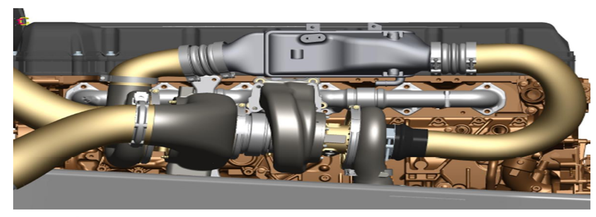
The objective is to demonstrate a substantial reduction of CO2 emissions, 15% improved fuel efficiency compared to a EURO V engine and at the same time fulfilling EURO VI emission legislation.
By using novel technology combined in flexible engines with a high level of precise control, performance advantages will be achieved with improvements in emissions and fuel consumption.
It is envisioned to achieve 6 to 9% in the sub-projects, see diagram, with different engines, powertrains and fuel approaches. The hybridization of the powertrain will contribute with an estimated 3 to 5% fuel economy improvement. Additional 2 to 4% of fuel economy improvement is attributed to friction reduction of the combustion engine and energy efficient exhaust gas aftertreatment systems and operation.



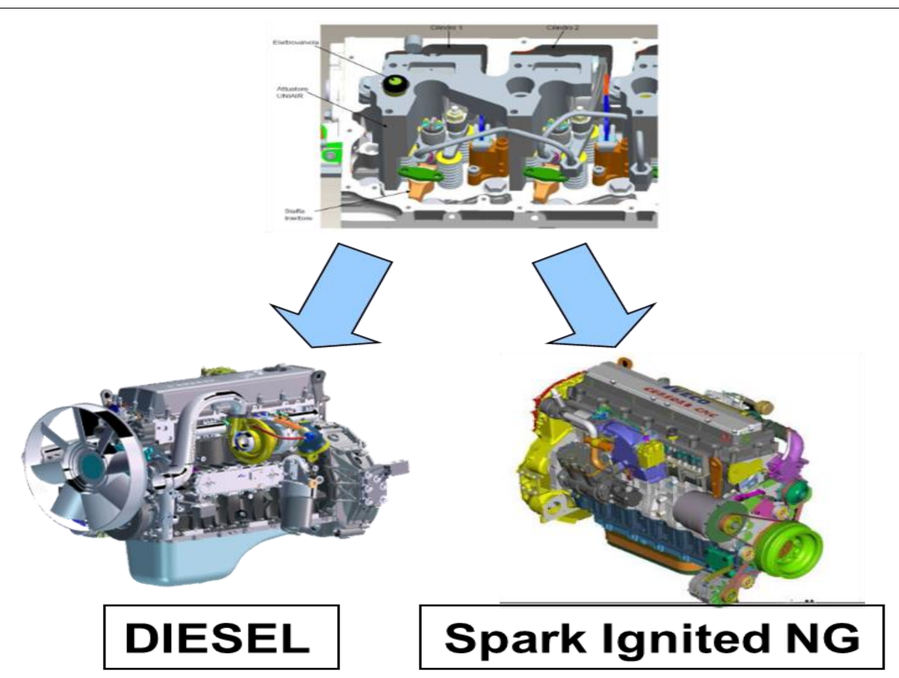
CORE roadmap for CO2 reduction

Results

Current status of achieved results shows a good potential towards the targets of improved fuel efficiency. Performed engine simulation and first engine tests in steady state operation indicate fuel improvements close to the target for the engine platform. Major contribution to obtain this improvement is derived from new matched high efficient turbosystem in combination with variable valves.

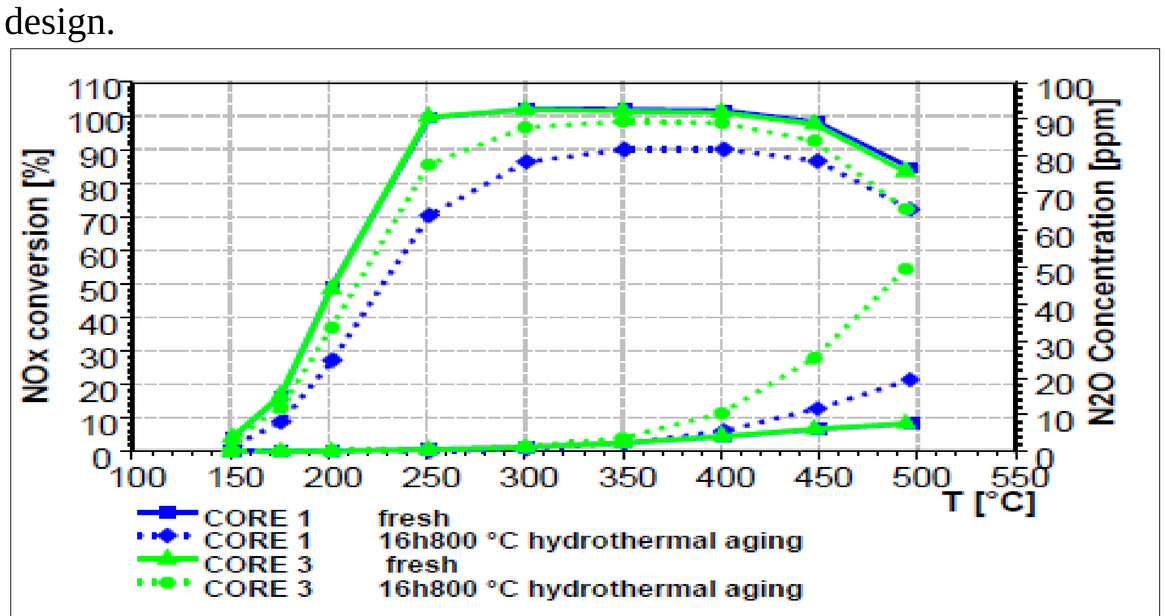


New design of two stage turbo applied on the engine



VVA technology is applied both on diesel and NG engine

For the aftertreatment system, low temperature performance of the SCR system has been improved by novel coating of Cu-zeolite formulation. Novel particulate filter has obtained lower backpressure is by new design.



Improved low temperature performance with new SCR coating

Conclusions

The project is on its course towards the objectives, however challenging work remains in order to fully reach the targets in all steps, and to prove these figures in a transient duty cycle operation on the engine concept.
Find future results on the webpage: www.co2re.eu