

# Fuel Consumption improvement of a LCV diesel engine by conventional measures, targeting post Euro 6 emission compliance

Within the EU-funded Horizon 2020 “dieper” project (Diesel engine efficiency improvement and Particulate number Reduction), the authors are working to develop a Light Commercial Vehicle (LCV) demonstrator to enable emissions of 50% of Euro 6 limits and a >80% reduction in particulate numbers including in the 10-23nm range. A fuel economy improvement of >5% is also required.

The baseline vehicle was measured at project start (2017) and the improved vehicle will be measured again the end of the project (2019).

The project includes engine subsystem modifications and related new control functions. The subsystems to be developed are engine friction, combustion / fuel injection, turbo-charging & charge air cooling, exhaust gas recirculation, coolant system and engine after-treatment.

The after-treatment system to be screened on engine test-bed consists of a dCSC™ (diesel Cold Start Catalyst), an SCRf, with a urea doser and mixer to be fitted in between the dCSC™ and SCRf, and an underfloor SCR. Analysis of this system indicates the project targets of 62.5 mg/km NO<sub>x</sub> should be achievable for both total trip and urban phase even under most challenging RDE conditions.

For CO<sub>2</sub>, the 2017 limit is 178 g/km, corresponding to 6.8 l/100km (NEDC) or an average engine efficiency of 30%. In 2020, the real average mass of the vehicle will change from 1706 to 1834 kg. The specified limit at the new reference mass is 147 gCO<sub>2</sub>/km, which corresponds to 5.6 l/100 km (NEDC). The paper describes the baseline situation and improvement steps to reach the target. Hybridization and electrification are excluded from this project.

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