

# Abstract

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**Title:** Spray Guided Turbocharged Engine for Future CO<sub>2</sub> Reduction

**Conference:** FISITA 2008

**Date:** 14.-19.09.2008

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Based on the well-known TurboDISI concept FEV has consequently developed a further evolution called "**S**pray **G**uided **T**urbo" **SGT** engine, which shows significantly improved performance and fuel consumption data. The turbocharged engine was improved using a spray guided combustion system with central injector location and piezo injector technology. Detailed design changes regarding cooling system performance and higher mechanical loads were introduced, so that a significantly higher specific power output is achieved. The concept layout was realized using FEV's specific CAE methodology (CMD process) as well as single cylinder investigations. The ECU software is based on an in-house control system library and is used in an open rapid prototyping hardware, which can be extended to individual customer needs.

Finally an outlook of future gasoline powertrains in the field of stoichiometric and lean burn combustion concepts is shown. Additional fuel consumption reduction potential will be achieved by introduction of high load EGR, use of alternative fuels and hybrid functionalities. It can be concluded, that the CO<sub>2</sub> targets of the EU of 130 g/km in the NEDC can be achieved with a mid-class passenger car.