

### MAHLE Powertrain CNG Demonstrator Vehicle



25% CO2 Emissions Benefit

Improved Low-End Torque

Up to 400km Driving Range

Gasoline engine downsizing is already established as a proven technology to reduce the carbon dioxide emissions of automotive fleets. Additionally, alternative fuels such as natural gas offer the potential to reduce significantly both tailpipe carbon dioxide emissions and other regulated exhaust gas emissions without compromising the driving performance and the driving range.

The fully optimised engine demonstrated significant measured improvements in peak thermal efficiency (+14%) and CO2 emissions (-50% at peak power) whilst maintaining the same outputs as the original gasoline engine (120 kW and 286 Nm).



>> CNG DI-3 Engine

- Vast experience in alternative fuel combustion processes
- Specific engine design considerations & knowledge
- Continuous advanced research activities
- Use of in-house baseline engine for back-to-back comparison
- Application of proven control systems for bio-fuel engines
- Full development of alternative fuelled engines & vehicles
- Understanding of relevant fuel storage issues

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### MAHLE CNG Demonstrator Vehicle

In comparison to a standard production gasoline engine (1.4 litre TSI) with similar power and torque outputs, the MAHLE CNG equipped demo vehicle has achieved a reduction in CO<sub>2</sub> emissions from 154 g/km to 115 g/km based on the NEDC cycle. Even greater benefits were seen at higher loads and higher power outputs, making CNG highly relevant as a solution to deliver real-world fuel consumption and emissions benefits for end consumers and under the new RDE / WLTP test cycle conditions.

The MAHLE CNG demonstrator vehicle has clearly shown that cars equipped with an engine designed specifically to run on CNG can be both fun to drive and very efficient.



>> CNG Demo car on chassis dyno

#### CNG optimised engine

Engine layout:	3 cylinders in line
Bore/stroke:	83.0 / 73.9 mm
Displacement:	1200 cm <sup>3</sup>
Compression ratio:	13.3:1
Fuel system:	CNG DI and Gasoline PFI
Nominal power :	120 kW
Nominal torque :	286 Nm (BMEP, 30 bar)
Peak cylinder pressure	180 bar
Turbocharger	VTG-TC



>> MAHLE CNG Engine

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