

# NEW ENGINE SLASHES CO<sub>2</sub> EMISSIONS

IMPACT!

Engineering and Physical Sciences Research Council | Case study 17



↑ 15%

cut in carbon emissions from the HOTFIRE engine.

## A new car engine, developed with EPSRC support, boosts fuel efficiency and delivers a 15 per cent cut in carbon emissions.

The technology, that sprays fuel straight into the cylinders without needing to mix it with air, has attracted interest from major car manufacturers.

The award-winning HOTFIRE project is a collaboration between Lotus Engineering, University College London, Loughborough University and Continental Powertrain.

### IMPACT ON THE ENVIRONMENT

- Project HOTFIRE has developed affordable engine technology that can cut carbon emissions by 15 per cent.
- The engine's direct fuel injection and variable valve operation controls air intake without compromising efficiency.

### THROTTLING CARBON EMISSIONS

An industrial-academic collaboration between Lotus Engineering, University College London, Loughborough University and Continental Powertrain, supported by EPSRC, has led to the development of a concept car whose engine sprays fuel directly into the cylinders of a petrol engine rather than using a fuel/air mix. The system gives a fuel efficiency boost of 15 per cent without loss of power.

### Collaborative boost

According to Mike Kimberley, chief executive officer of Group Lotus Plc: "Project HOTFIRE is an excellent example of an industry and academic partnership producing world-class research for the benefit of the environment and the car buyer." He adds that the technology is affordable and has already caught the interest of the car industry, which is keen to lower emissions.

### Direct injection

In a conventional petrol engine, when the throttle in a car is closed, the air intake is partly closed off and the engine has to work harder to pull against a partial vacuum. The HOTFIRE system avoids these so-called throttling losses by directly injecting fuel into the engine cylinders and at the same time controlling air intake using variable valves. This means the amount of air sucked into the engine to allow internal combustion can be varied without reducing efficiency.

### Award-winning efficiency

The 15 per cent reduction in carbon emissions, the affordability of the technology, and its environmental potential have already won it the automotive category at The Engineer Technology and Innovation Awards 2008.

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