

# Debate: Dr Bruno Pollet

## Do you agree that the future of fuel is in cleaner combustion?

**No**

### **Dr Bruno Pollet FRSC**

Fossil fuels are a finite resource – this much we know. Vehicles relying on petrol or diesel powered internal combustion engines (ICEs), which have been our primary mode of transport for more than 100 years therefore also have a limited lifespan.

In December 2008, the Climate Change Committee and DECC recommended a minimum 34% cut in GHG emissions by 2020, with a 42% cut in the UK. In the UK, indigenous primary energy resources are diminishing while demand is increasing. North Sea oil and gas have peaked and are in decline.

Our desire to use vehicles will not suddenly evaporate when oil and gas reserves are exhausted, so we need to urgently develop the next generation of sustainable fuels.

This move towards greener fuels is also an increasingly significant part of government policy with the committed to a substantial increase in renewable energy over the next decade as a major part of its programme to reduce carbon emissions. Currently 1.8% of energy used in the UK comes from renewable sources. The UK Government aims to increase this to 15% by 2020 in line with EC proposals.

Hydrogen fuel cell technology meets the requirements of a new generation fuel in almost every respect. Firstly and most importantly the application of fuel cell technology is emission free (in fact the only emission from a hydrogen fuel cell vehicle is water).

Secondly hydrogen fuel cell technology can already be used effectively in a wide range of vehicles as well as domestic applications (Combined Heat and Power – CHP). There is more work to be done at a scientific level in refining the technologies to make them more efficient and more cost-effective, but putting hydrogen powered fuel cell vehicles onto the road.

Finally hydrogen is an immensely abundant natural fuel source that can be captured from a number of sources including domestic waste using modern methods.

There have been remarkable advances in developing more efficient diesel and petrol engines that produce fewer emissions. Nevertheless this technology can never be emission free and has a finite lifespan tied to the availability of fossil fuels.

Despite the progress that has been made in hydrogen fuel cell technology we still face challenges in developing effective methods for generation and delivery. For hydrogen to be a green fuel it needs to be produced in a sustainable way. There is little value in producing hydrogen from fossil fuels, which although feasible, would be ecologically unfriendly. There are methods for green hydrogen capture from fuel waste and using solar panels but these are largely being used on a very small scale.

The second obvious challenge is that of developing a distribution network. The range of hydrogen fuel cell vehicles is already impressive (300-400 miles) but the technological developments in vehicles needs to go hand in hand with the development of a refuelling infrastructure. This is an area where investment and direction from central government could make a significant difference and would bring the UK in line with Germany and Scandinavia who are already investing in this technology.

The current focus is on the development of Hydrogen and Fuel Cell technologies and their associated supply chains that offer significant quantitative improvements in: a) lowering costs (by a factor of 10-100) and significantly improving reliability, durability and performance for the stationary, transport and portable markets; b) addressing the challenges related to hydrogen generation, storage and utilisation; and c) the acceleration of Hydrogen and Fuel Cell technologies deployment to various markets such as cars and buildings.

Those working in the field recognise the challenges to the widespread adoption of hydrogen fuel cell vehicles as a standard method of transport, nevertheless hydrogen fuel cells represent the greenest and most practical solution to the fuel crisis we are currently facing."