



Battery-run sports car could speed up end of petrol engine

With soaring fuel prices and punitive laws looming, electric vehicles look attractive

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Parking his sports car alongside other executives' Audis and BMWs in Richard Branson's grand estate in Oxfordshire last month, Jeremy Leggett - the last person you would describe as a petrolhead - had just made history. The chief executive of Solar Century and former Greenpeace activist had become the first person in the UK to test drive the revolutionary Tesla sports car, powered entirely by electricity.

He had driven up from London one evening last month for the business awards event at Branson's home with Rosie Boycott, a former editor of both the Daily Express and Independent. The first time he overtook a car on the motorway, Leggett asked his companion to tell him if he was driving too fast. 'No you're not, dear,' Boycott replied, 'just make sure you get us there in one piece.'

With the car doing 0-60mph in just four seconds, you can't blame her nervousness. About 650 Tesla roadsters will be made this year, at a cost of \$100,000 (£50,500) each. The car, which can travel 225 miles before it needs to be recharged, is challenging the accepted wisdom that electric cars are no match for their dirtier petrol- or diesel-powered rivals.

With the soaring cost of petrol - witness the latest protest by road hauliers last week - the attractions of finding an alternative to the internal combustion engine are growing. Environmental regulations are also increasingly discriminating against conventional cars.

The government is already under pressure to stage another U-turn over its plans to retrospectively tax older cars that pollute more. In Europe, MEPs are hammering out the details of a new law that if approved will force car makers to cut the carbon emissions of their new models by about a fifth from 2012 or face massive fines. So faced with soaring costs and swingeing regulations, are the days of the conventional engine over?

Car makers are working on myriad new technologies to reduce the reliance on petrol and diesel, and offer competing claims as to why their chosen technology is superior to their rivals'. Broadly speaking, these can be split into three categories: electric vehicles, hybrids that combine electric power with another source, and those powered by hydrogen fuel cells.

Only the first two categories are available in car showrooms now, and in tiny numbers. According to the car manufacturers' trade body the SMMT, last year just 397 pure electric cars, such as the G-Wiz, were sold in the UK, less than 0.02 per cent of the total. Hybrids, like Toyota's Prius, notched up about 16,000 sales or 0.6 per cent. Analysts estimate that as the technology becomes cheaper, hybrids could make up about 14 per cent of total new car sales by 2012.

The Prius hybrid teams a petrol engine with an electric battery that powers the car at low speeds. At high speeds and with fast acceleration, the Prius's petrol engine kicks in. As a result, the Toyota has far lower emissions than other mid-range cars. But critics point out that smaller conventional cars have lower emissions than the Prius, which needs to be larger to accommodate the engine's extra weight and so consumes more fuel.

The big car makers are working on 'next-generation' hybrids. GM is developing the Chevrolet Volt, run entirely on electricity but with an internal combustion

engine that recharges the battery. It hopes to start large-scale production within five years. Cost is a big issue however: charity WWF estimates that a battery system for these 'plug-in' hybrids costs about \$10,000 more than one for a conventional dual-fuel system.

Further away, despite the initial success of the G-Wiz car and the emergence of the Tesla, is the mass roll-out of pure electric cars. Fossil fuels give a car more range and higher speeds than even the most advanced batteries, which are heavier and need to be recharged more regularly than a tank needs to be refilled with petrol.

Electric cars also need a network of charging points, which doesn't yet exist on any large scale. The vast majority of electric cars are sold in London, as it is the only city in the UK to have installed charging bays on the street and in car parks. Steve Hartridge, managing director of GoinGreen, which distributes the G-Wiz in the UK, admits: 'The roll-out of the G-Wiz in the UK has to be gradual.'

Even further away from commercial development are cars that are powered using hydrogen fuel cells. They face two big problems: one is the vast amount of energy required to make hydrogen. The other is the lack of a hydrogen infrastructure to charge cars' fuel cells.

Analysts say that the conventional gasoline engine will be phased out over the next 20 years and replaced by 'plug-in' hybrids, clean diesel engines and electric cars. Graham Smith, president of the SMMT and Toyota Motor Europe's senior vice-president for external and environmental affairs, denies that the internal combustion engine will disappear 'any time soon'. Paul Newton, analyst from Global Insight, cautions: 'There is no doubt that we are approaching a tipping point, but it is very early days.'