

Electric Vehicles

Riversimple steers Rasa hydrogen car prototype to public trials

Car to be offered on mobile phone-style contract with monthly fee and mileage tariff



The Riversimple Rasa hydrogen-powered prototype

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by: **Andy Sharman**, Motor Industry Correspondent

The early blows in the [hydrogen versus electric \(http://next.ft.com/content/b52aa5a6-6439-11e4-bac8-00144feabdc0\)](http://next.ft.com/content/b52aa5a6-6439-11e4-bac8-00144feabdc0) car battle may have been landed by the likes of Toyota and Tesla but a tiny start-up from the Welsh town of Llandrindod Wells has joined the fight.

Riversimple Movement is taking its hydrogen fuel-cell project — now 15 years in the making — to the next stage with the unveiling of its first production-ready, road-legal prototype and the start of a public trial.

In the autumn, about 20 people will have the

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chance to drive away a carbon-fibre Rasa, which may look slightly kooky with its rear-wheel spats and butterfly doors but packs four electric motors and can travel for 300 miles on a single fill-up.

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“We’re not targeting the ecological market. We want it to look good,” says Hugo Spowers, who founded the company in 2001.

Riversimple is charting a difficult course. Toyota, the world’s biggest car manufacturer, has made hydrogen fuel-cell technology its [big bet \(http://next.ft.com/content/a2d9151e-7427-11e5-a129-3fcc4f641d98\)](http://next.ft.com/content/a2d9151e-7427-11e5-a129-3fcc4f641d98), launching the £66,000 Mirai at the end of 2014. The technology is meant to offer the environmental benefits of electric cars with fast refuelling time and long driving range.

But many in the motor industry doubt that it can become a dominant fuel source. Hydrogen vehicles — essentially electric cars with gas tanks — face increasingly strong competition from more conventional zero-emission cars such as pure electrics powered by lithium-ion batteries and plug-in hybrids.

Early-adopters of hydrogen cars also have few options when it comes to filling up. The UK has just 14 hydrogen fuel stations — not all of them accessible to the public — though the government is funding 12 more.

The first production models, such as the Mirai and the Hyundai ix35, retail for around twice the average price of a new car because of the high cost of the fuel-cell stacks — which create electricity out of hydrogen and oxygen.

Critics also point out the low energy efficiency of fuel cells versus lithium-ion batteries. This means

the cars need to carry lots of gas, says Mr Spowers. The Mirai, for instance, has two fuel tanks.

Riversimple has tried to bypass these constraints by designing an aerodynamic two-seater that weighs just 580kg — about half a conventional small car.

The Rasa employs four in-wheel motors that can recover more than 50 per cent of the kinetic energy from braking — far higher than with normal regenerative braking systems. That energy is fed into supercapacitors that provide the bulk of the power for acceleration, meaning the car can get by with a small 8.5kW fuel cell stack and a single, 1.5kg tank of hydrogen without compromising performance.

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Hugo Spowers, Riversimple

The
Rasa
has its

constraints. It is tiny and the top speed is only 60mph, though this can be reached in a punchy 10 seconds.

But the Rasa has been made for a specific purpose — it is a local car, designed to operate in a 25-mile radius around a single hydrogen station. The 300km range is considered a week's fuel rather than a potential single trip.

Not only is Riversimple building a car from scratch using a technology that is unproven at the mass-market level. It is trying to do it at the equivalent "total cost of ownership" of a basic, diesel-

powered Volkswagen Golf, Europe's best-selling car.

It says this would not be possible by simply offering the car for sale. So it will offer mobile phone-style contracts — a flat monthly fee for the car plus a mileage tariff — that run typically for one to three years.

Mr Spowers says the business model works because carmakers typically only capture around 40 per cent of the lifetime revenues from a car.



Riversimple's model, however, projects a 15-year lifetime and sees the company taking potentially all of the revenues, because the service contracts include fuel, insurance and maintenance.

"Everything is channelled through us," says Mr Spowers, though the company has yet to decide on a specific tariff.

Riversimple is now talking to the Welsh government about building a small factory capable of 5,000 units a year — which would make it a tenth of the size of the UK's biggest plant, Nissan in Sunderland.

The company has a €2m grant from the European Union to support the trial and help fund a refuelling point.

The Rasa was named for the blank-slate approach the company says it is taking to carmaking. Parts are chosen not on the basis of how cheap, light or powerful they are but how they will affect the business model.

This includes the carbon fibre shell, which may make the car expensive to produce but results in a lighter product, meaning a smaller fuel stack with less fuel demand.

“One investor told me this was the first time he’d seen a car built for a business model rather than the other way round,” says Mr Spowers.

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