2 MINS

BATTERIES NOT INCLUDED

Electric batteries might be just the ticket for powering short hops in the personal flying vehicles of the next decade, but what if you want to fly further? **Paul Sillers** reports

Going the extra mile? If so, hydrogen fuel cells – rather than electric batteries – could be the antidote to range anxiety, according to Singapore-based HES Energy Systems, which has revealed plans for a hydrogen-powered aircraft called 'Element One'.

Business Life caught up with the firm's sales manager for EMEA, Bertrand Gauthier, who says that after 12 years developing hydrogen propulsion systems for small unmanned aircraft, the company is cranking up its tech several notches to cater for the future of passenger flight: "From the experience we have in the remotely piloted vehicle market, we decided to start looking at aviation – trying to scale up this technology that we developed both on the fuel cell size and also the storage and fuel integration of the technology, and trying to find a way to implement that quickly."

Why hydrogen fuel cells? Hydrogen packs more punch, pound for pound, than lithium batteries, and could be the energy paradigm of choice for small airliners of the future. "Right now electric batteries deliver 200 to 250 watt hours per kilo, whereas with hydrogen fuel cells it's already between 400 and 1,500 watt hours per kilo, depending on how you store the hydrogen," says Gauthier.

The design concept behind Element One is to fly four passengers for 500km to 5,000km (depending on whether hydrogen is stored in gaseous or liquid form), offering a service performance that's "several orders of magnitude better than any battery-electric aircraft attempt so far," according to HES. To make it viable, the company envisages a network of "hydrogen-ready airports", and HES says it's "now in discussion with industrial-scale hydrogen producers to explore energy-efficient refuelling systems using renewable solar or wind energy produced locally".

"In terms of the business model," says Gauthier, "it's about decentralised air mobility. It makes sense in terms of the integration of renewable energies. We need to take that into account and it's something we want to put forward because we look at it as an entire chain – not just the airplanes flying. It goes with the infrastructure on the ground, which goes with power sources, local economies, etc. So we think it's important to look at the big picture before bringing a technology forward."

> Hydrogen could be the energy paradigm of choice for small airliners of the future

The premise of HES's system is that, once such infrastructure exists, refuelling Element One will take "no more than ten minutes" using a robotic hydrogen fuel cell swapping system. The company's focus is now on getting partnerships in place with entities that have the right expertise to take the concept through and beyond the design development process, with first flights slated for the middle of the next decade. According to Gauthier, "We're probably going to be flying the first Element One aircraft by 2025, so right now we're building the consortium to have the right people in the team – of course, HES won't be doing that alone. We know that we'll need partners that are specialists in hydrogen and in aeronautics and certification." ■

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Powering up
HES hopes to have its first hydrogen-fuelled Element One airplane in the sky by 2025