

Hydrogen Fuel Cells Are Losing The Battery Electric Car Race, But It's Only Lap 1

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Power to gas concept in nice morning light. Hydrogen energy storage with renewable energy sources - ... [+]

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Battery-electric cars have won the short-term race for green ascendancy, but the case for hydrogen fuel cells refuses to go away, even though its start date is receding into the distance, according to a report.

Meanwhile, defying conventional wisdom and the protestations of

politicians and environmentalists, the hated internal combustion engine (ICE) is still going to be an important contender on global roads, even by mid-century.

The report, "There's still hope for the fuel cell", from consultancy LMC Automotive, concedes short-term victory for battery electric vehicles (BEV) but points out some big built-in negatives that might undermine its long-term dominance.

LMC Automotive said range might be getting close to ICE cars, but long refuelling times represent a big negative to potential purchases of BEVs. Battery production sustainability is another hurdle that looks like lingering. For fuel cells, the magic bullet could well be the ability to use excess renewable energy from wind farms, solar, and hydro to produce hydrogen.

The trouble is, believers in hydrogen have a long time to cool their heels before claiming at least the possibility of victory.

"Our current view is that FCEV (fuel cell electric vehicles) will start to emerge in earnest from around 2035," said LMC Automotive analyst Sam Adham.

"This is when we estimate renewable energy infrastructure to be sufficiently developed and able to facilitate a holistic hydrogen economy, without the need for a vast and potentially damaging battery production industry. Hydrogen has many other applications besides transport. In the end, this may be what swings the pendulum in favor of fuel cells. After all, hydrogen still has a lot going for it, on account of it being the most abundant element in the universe," Adham said.

A recent report from IHS Markit expected a barely perceptible trickle of new fuel cell cars through 2030, with maybe about 500,000 FCEVs a year by

2032 marking the point of take-off. Despite the aggressive talk of some politicians demanding the end of ICE car production by the mid-2030s, sales will continue to defy these predictions. IHS Markit forecasts ICE cars plus mild-hybrids (gas engines much enhanced by electric powered components), will account for 70.6% of global production by 2030. LMC Automotive expects ICE cars to command a close to 50% global market share by 2030 and about 10% by 2050.



Hydrogen car concept

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Battery power has some environmental concerns. Mining for crucial metals like cobalt, lithium, nickel and copper often raises concerns about worker and environmental safety. Safe recycling is a challenge. Some experts question battery's carbon dioxide (CO₂) performance, saying big sedans

or SUVs with large batteries don't save much lifetime CO2 compared with ICE cars.

And some experts doubt the possibility of ever producing enough hydrogen from renewable processes.

In the report, LMC Automotive lined up the various merits and faults of BEVs versus FCEVs -

BEVs are good because –

They have momentum, world sales near 2 million in 2019

Basic charging infrastructure widely available

Wide choice of sedans and SUVs

Affordability is improving

BEVs are bad because –

Range often weak, charge time too slow

Prices still perhaps 50% too high

Promised battery breakthrough still awaited

Battery raw material supply may not be sustainable

Battery recycling very difficult, high in CO2

FCEVs are good because

Refuelling time quick, comparable to ICE

Technology proven, available

Energy capacity of hydrogen far greater than battery

Lower environmental impact from production

Power stacks refurbishable, 95% recyclable

FCEVs are bad because

Almost no vehicle availability; prices huge

Sparse refuelling network, hugely expensive to build

Costs greater than BEV because of low volume

The few available models powered by hydrogen fuel cells currently include the Toyota Mirai, the Honda Clarity and the Hyundai Nexo. Mercedes has put its fuel cell car project on hold while concentrating on the truck market in a deal with Volvo. BMW is working on the iNEXT hydrogen concept car, but says it has no plans yet to bring this car to market, saying the time is not yet right, nor the infrastructure in place.

The European Union (EU) is pushing a hydrogen program which will also be aimed at aviation and heavy industry. China has expressed an interest in developing the technology.



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U.S. investment researcher Energy & Capital reported that the Hydrogen Council, a global corporate outfit established to push the technology, reckons that by 2050, hydrogen will power more than 400 million cars and SUVs, up to 20 million trucks and 5 million buses. Hydrogen will provide 18% of the world's energy.

LMC Automotive said in the report commercial vehicles may be the first area of application for FCEVs because heavier vehicles aren't so well suited to battery power because of the huge battery weight involved.

"Despite the comparison made with BEVs, one must not see this as 'BEV vs. FCEV', but rather as 'ICE vs. ZEV' (zero emissions vehicle). If future mobility is to be zero-emissions, BEVs cannot be the only solution, and are not

suitable for all applications. Despite the colossal investment required to enable either powertrain, putting all your eggs in one basket is rarely a good idea, however tempting, when it comes to technology selection," Adham said.

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As a former European Automotive correspondent for Reuters, I've spent a few years writing about the industry. I will penetrate the corporate hype and bluster and find

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