

The Nikola Tre fuel-cell truck will have a range of up to 1,200 km (depending upon configuration)

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IN IT FOR THE LONG HAUL

Platinum-based fuel cells are making zero emissions a reality for commercial fleets looking for long-term, sustainable solutions

Trucks are a crucial part of today's global supply chain. However, the transport sector currently has an overwhelming reliance on fossil fuels – 92 per cent according to a recent report by the International Energy Agency.

While gasoline and diesel engines are not set to be phased out anytime soon, and are themselves benefiting from 'cleaner' technologies, viable zero emissions transportation options are becoming a necessity in the drive to meet decarbonisation targets and tightening emissions standards.

Owners and operators of long-haul commercial fleets looking for fossil fuel-free alternatives with zero tailpipe emissions are increasingly recognising that platinum-based hydrogen fuel cell electric vehicles (FCEVs) are the technology that best meets their needs. FCEVs offer the range required by heavy duty vehicles like trucks that battery electric vehicles (BEVs) simply cannot offer.

In a BEV, the size and weight of the large battery needed to power such a heavy vehicle compromises both range and payload, whereas the FCEV has only a modest battery that is continuously recharged by the fuel cell. Of course, fuel cells share many of the characteristics of a battery: silent operation, no moving parts and an electrochemical reaction to generate power.

However, unlike a battery, fuel cells do not necessitate lengthy recharging stops to 'refuel'. FCEVs are equipped with space-efficient hydrogen storage tanks that can be filled up quickly.

In a platinum-based fuel cell, electricity is generated through an electrochemical reaction by combining hydrogen and oxygen, with heat and water as the only by-products. Molecules of hydrogen and oxygen react and combine using a proton exchange membrane (PEM) which is coated with a platinum catalyst, and there is no combustion.

Growing momentum for fuel-cell trucks

Deployment of platinum-based fuel cell vehicles in the haulage sector is not just dependent on the reliability and availability of makes and models.



Toyota's FCEV truck combines the Kenworth T680 Class 8 model with its fuel cell electric technology

It also requires access to hydrogen refuelling infrastructure – ideally supplying hydrogen from ‘green’ sources. It is therefore not surprising that ‘captive’ fleets, such as buses or shorter-range delivery lorries, have been especially quick to take on board this new technology, able as they are to provide refuelling points in depots or other convenient hubs.

Manufacturers including Nikola, Toyota, Hyundai and Daimler are at the forefront of fuel-cell truck production and recent developments have seen momentum grow. Start-up Nikola begins production on its fuel-cell models next year.

Nikola FCEV trucks will have a range of 500 km – 1,200 km depending upon model and configuration. In the US, it is anticipated that by

2028 Nikola vehicles will have access to a network of 700 refuelling stations using hydrogen from renewable sources that is to be rolled out by Nikola as part of its commitment to developing the long-haul FCEV truck market.

Meanwhile, Toyota has recently entered into a partnership with Kenworth Truck Company to produce fuel-cell trucks for the Californian market with a range of more than 300 miles under typical driving conditions. This follows Toyota’s successful trial of Class 8 fuel cell drayage trucks at the Port of Los Angeles. The trial was part sponsored by the California Air Resources Board, as part of its Zero and Near-Zero Emissions Freight Facilities Project.

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