From Smoke to Water: How Toyota Engineers in California are Helping to Clear the Air with Hydrogen

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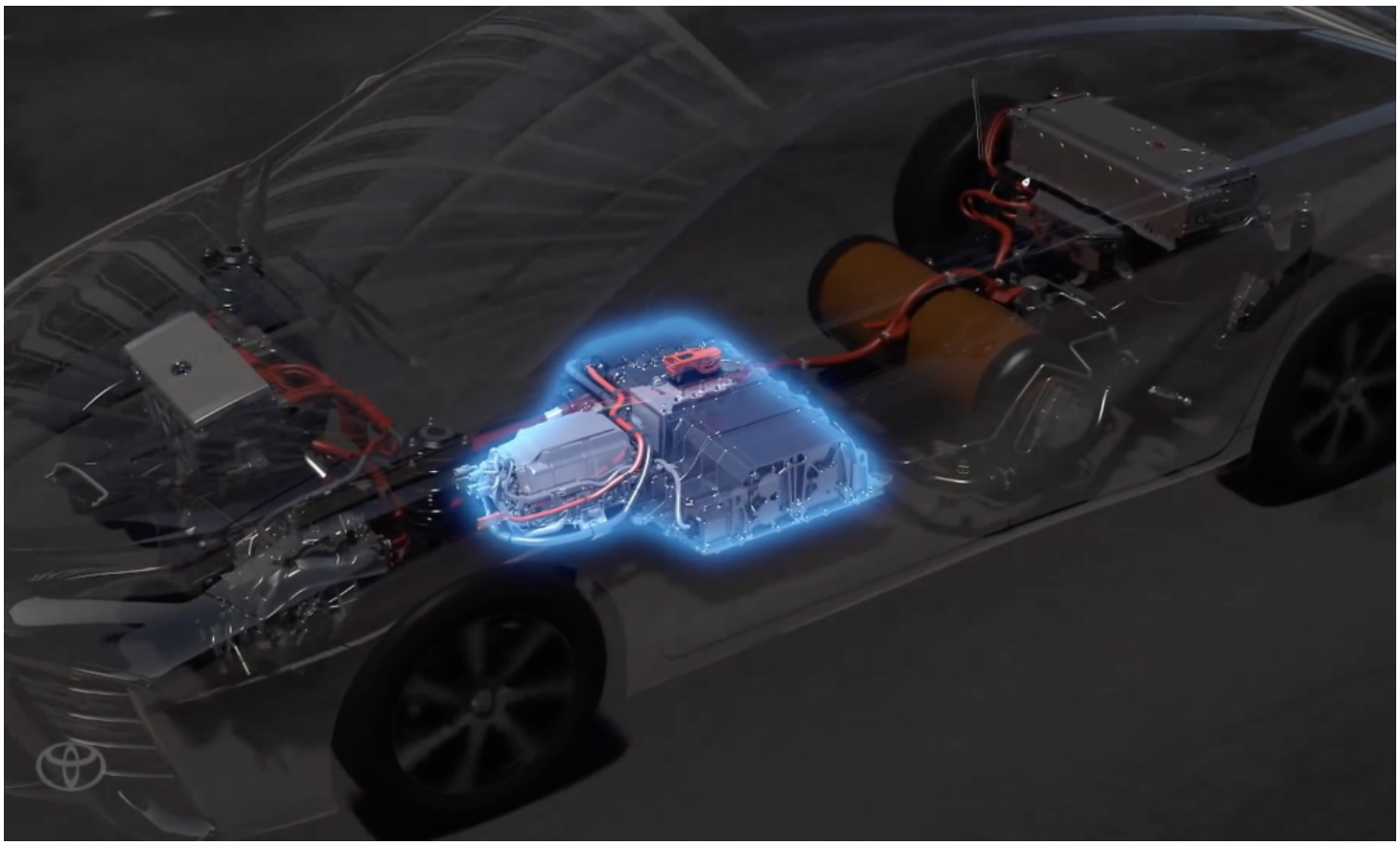
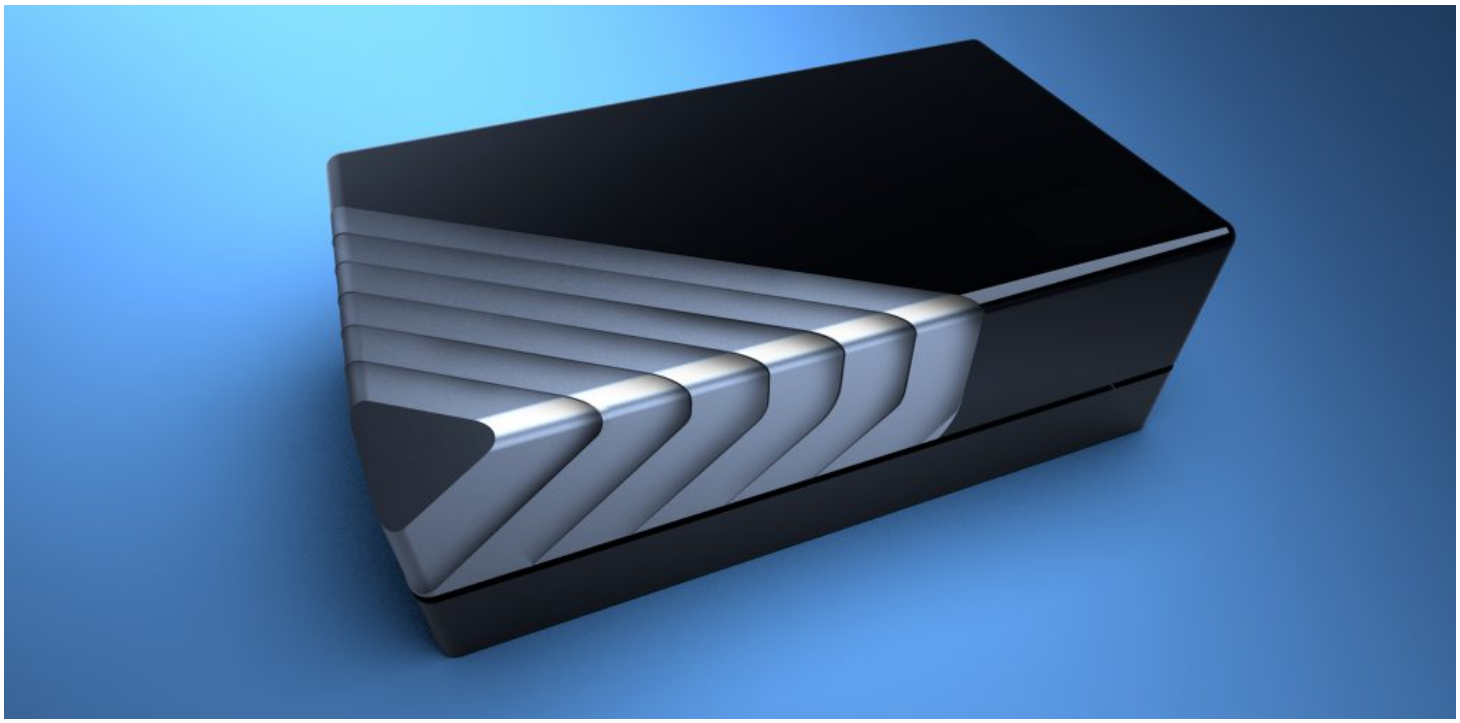


The difference between the exhaust of a diesel engine and the emissions from a hydrogen fuel cell is literally night and day. Most diesel engines used in industrial equipment and stationary generators spew thick black smoke while hydrogen powered fuel cells emit nothing but pure water.

The difference is startling, and it’s a big reason why a team of engineers at Toyota Research and Development in Gardena, Ca is working on technology that will give numerous companies the option to ditch diesel and go green.

At the core of the California team’s research is hydrogen fuel cell technology pioneered by Toyota engineers in Japan. Over two decades in development, Toyota’s fuel cell technology debuted in the 2015 Mirai sedan, the first production car to use a hydrogen fuel cell to power its electric drive motors.

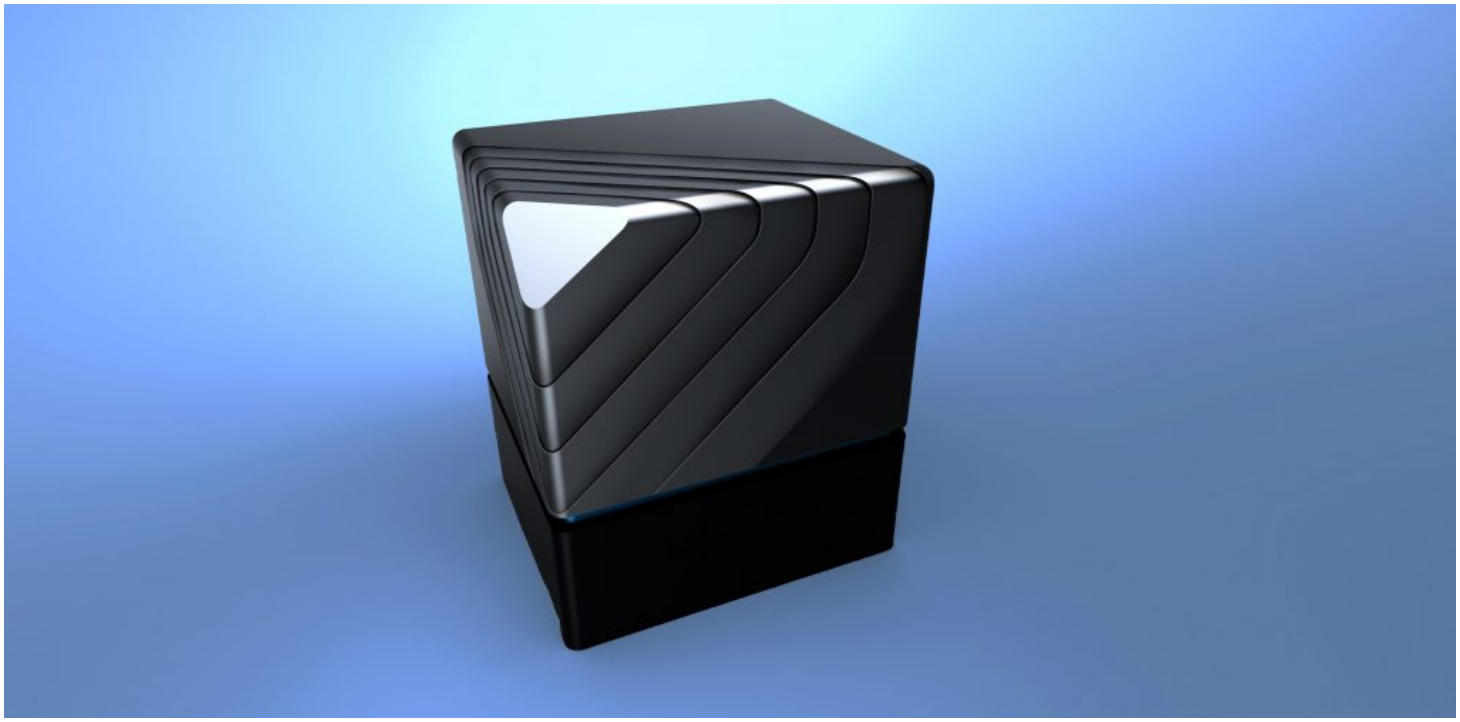


Now, that same technology is being adapted for industrial use with the introduction of the Hydrogen Drive modular system. The technology is complex, but the idea behind Hydrogen Drive is simple – package nearly everything you need to create clean, emissions free electricity into a standardized kit that can provide power to various mobile platforms or act as a stationary generator.

It's not quite as simple as attaching a few pipes and wires, of course, so the engineering team in Gardena is working closely with potential customers to assure that the Hydrogen Drive system meets their expectations.

"We're the only Toyota R&D facility in the U.S. that has a fuel cell system test bench, so we're able to see firsthand how this system performs under a variety of conditions," said Daniel Folick, a senior engineer at Toyota Research and Development. "Using this information allows us to both validate the system's capabilities and simplify its integration for our potential customers."

Those customers include companies like port operators that move cargo containers on-and-off ships, onto railcars or into port storage facilities. These movements require a wide range of specialized equipment, most of which is currently diesel-powered.



“The Hydrogen Drive kit gives these companies a clear path toward converting their fleets from diesel-power to zero-emission fuel cells,” said Folick. “We’re not only offering a compact and flexible system, we’re using our expertise to help integrate these systems into already existing vehicles to make them as reliable as they are clean.”

Toyota has been working to bring emissions-free fuel cell technology to the industrial sector since 2017. It started with Project Portal, a Class 8 semi truck that utilized fuel cell components borrowed directly from the Mirai. Since then, Toyota’s fuel cell technology program has expanded to include a port utility vehicle in Long Beach and a stationary power generator in Japan.