



## **ELECTRIC VEHICLES**

# **BEYOND GASOLINE**

A mobility revolution is underway. Can vehicle manufacturers change without alienating current customers?

**BY JOE GUINTO**

**S**henzhen, China is an electrifying megacity. Its 16,000 buses went electric in 2017, and 99% of its fleet of about 22,000 taxis followed suit in early 2019, making up perhaps the world's largest all-electric vehicle fleets.

Shenzhen is already reaping the benefits—the city is quieter and has improved air quality, and its fuel consumption has dropped dramatically. This kind of shift is happening across China at a rapid pace: 99% of the 80,000 electric buses delivered globally in 2018 were destined for the country, according to Interact Analysis.

“If you look at the impact that that’s had on China, they have reduced their daily oil consumption by over 200,000 barrels,” Ryan Popple, CEO of American electric bus manufacturer Proterra, told CNBC in September.

China’s present is the world’s future, as the electric mobility revolution powers up. The shift is much slower in places like New York, where the transit authority had just 75 electric buses by the start of 2020. But the city has plans to add 500 in the next five years. California, the biggest vehicle market in the U.S., has mandated that all new buses purchased from 2029 onward be fully electric.

The global trend lines are clear: Battery-powered buses and trams have begun replacing outmoded gas-burning fleets around the globe at the same time that automakers—both new companies and legacy manufacturers—are boosting production of hybrid and all-electric vehicles. They have good reason to: 12 countries, including nine in Europe, have announced or proposed complete bans on gas-burning vehicles by 2040. (Norway’s ban takes effect in 2025.)

“The future of mobility is electric,” Ralf Speth, the CEO of Jaguar Land Rover, said last year.

Though gas-powered vehicles still domi-

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## "The future of mobility is electric."

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### THE TAKEAWAY

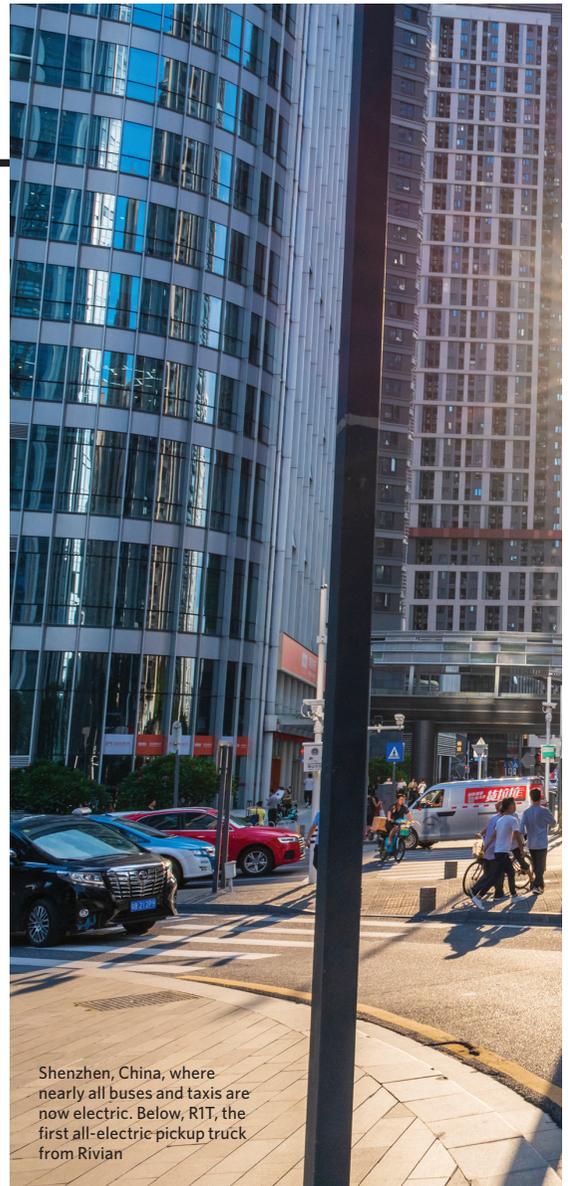
The long road to mainstream electric vehicles will come down to integration and infrastructure. Automakers are not only readying production facilities, but also investing heavily in their own battery technologies and charging stations. Yet realizing the industry cannot transform unless their customers do, automakers are pursuing a long-term strategy to gently push users into the future through paced innovation.

nate, longtime automakers are creating new all-electric divisions and investing in battery technologies. Some, like Volkswagen, have pledged to phase out their internal combustion engines in the near future. Meanwhile, some oil and gas companies are supporting these efforts, investing in their own battery capabilities and alternative energy sources.

"The electrification of transport is a global change that we are already experiencing in more than 35 countries," says John DeBoer, head of eMobility and the Future Grid Business Unit at Siemens, a leading developer of electric vehicle technologies. "Success in transportation electrification will require learning from the thousands of deployments and pilot programs that are now happening around the world."

### Carmakers Move On

The Leaf, the Bolt, the i3, the R1T, the Model Y, the Taycan, the Buzz, the e-tron—these are just a few of the hundreds of battery-powered vehicles that are already on—or soon coming to—the market, Bloomberg reports. Some of those vehicles are being introduced by new players like Tesla and Rivian, a Plymouth,



Shenzhen, China, where nearly all buses and taxis are now electric. Below, R1T, the first all-electric pickup truck from Rivian

Michigan-based company that is launching the R1T, an electric pickup truck, and the R1S electric SUV.

While Ford has invested a reported \$500 million in Rivian, the legacy Detroit automaker is busy developing its own fleet of all-electric vehicles, too. BMW, Volkswagen, Audi, GM, Porsche and Jaguar are at the front of the pack as well. (Jaguar Land Rover has pledged to offer electric versions of all its new models beginning in 2020.)

While Rivian and Tesla are building brand loyalty and new customers, legacy automakers have the added challenge of crossing into the all-electric future without leaving behind their current customer bases. The change to electric has been intentionally paced, allowing time for charging technology—perhaps the key to building consumer confidence in these vehicles—to become more easily accessible. Sorting out

Rivian's R1T electric truck



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how charging standards will integrate into charging station networks is another big challenge, involving regulators, landowners, vehicle makers and manufacturers. Siemens, which works with both electric vehicle makers and battery manufacturers, is pushing hard to develop standards that can drive the sector forward.

The company is trying to “accommodate and rationalize voltage ranges along with various data and IT security issues,” says Andrew Macleod, director of automotive marketing for Siemens Digital Industries Software. “Among the major objectives is how to future-proof charging systems given the pace of change in work on electric vehicles.”

The good news for automakers is that the electric revolution seems to be slow-rolling. Electric vehicles today have a paltry 3% market share versus gas-powered cars. In the meantime, automakers are remaking their

manufacturing plants, anticipating an eventual uptick in battery-powered vehicle sales.

“Although [an all-electric] future won’t happen overnight, GM is committed to driving increased usage and acceptance of electric vehicles through no-compromise solutions that meet our customers’ needs,” GM President Mark Reuss has said.

As automakers remodel their production chain, executives at major oil and gas companies are charting their own attendant transformation. Shell, for example, has acquired NewMotion, a Dutch company that operates one of Europe’s largest electric charging station networks. And in 2018, BP purchased Chargemaster, Britain’s largest electric vehicle charging company.

“The world is on an unsustainable path,” Bob Dudley, group chief executive for BP, told *The New York Times* in October. “We need a faster transition to a low-carbon energy system and a net-zero-emissions world.” **IQ**



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