

## **YOU CAN IGNORE REALITY, BUT YOU CANNOT IGNORE THE CONSEQUENCES OF IGNORING REALITY.**

### ICE vs Electric

By BRYAN PRESTON

Depending on how and when you count, Japan's Toyota is the world's largest automaker. According to *Wheels*, Toyota and Volkswagen vie for the title of the world's largest, with each taking the crown from the other as the market moves. That's including Volkswagen's inherent advantage of sporting 12 brands versus Toyota's four. Audi, Lamborghini, Porsche, Bugatti, and Bentley are included in the Volkswagen brand family.

GM, America's largest automaker, is about half Toyota's size thanks to its 2009 bankruptcy and restructuring. Toyota is actually a major car manufacturer in the United States; in 2016 it made about 81% of the cars it sold in the U.S. right here in its nearly half a dozen American plants. If you're driving a Tundra, RAV4, Camry, or Corolla it was probably American-made in a red state. Toyota was among the first to introduce gas-electric hybrid cars into the market, with the Prius twenty years ago. It hasn't been afraid to change the car game.

All of this is to point out that Toyota understands both the car market and the infrastructure that supports it perhaps better than any other manufacturer on the planet. It hasn't grown its footprint through acquisitions, as Volkswagen has, and it hasn't undergone bankruptcy and bailout as GM has. Toyota has grown by building reliable cars for decades.

**When Toyota offers an opinion on the car market, it's probably worth listening to. This week, Toyota reiterated an opinion it has offered before. That opinion is straightforward: The world is not yet ready to support a fully electric auto fleet.**

Toyota's head of energy and environmental research Robert Wimmer testified before the Senate this week, and said: **"If we are to make dramatic progress in electrification, it will require overcoming tremendous challenges, including refueling infrastructure, battery availability, consumer acceptance, and affordability."**

Wimmer's remarks come on the heels of GM's announcement that it will phase out all gas internal combustion engines (ICE) by 2035. Other manufacturers, including Mini, have followed suit with similar announcements.

**Tellingly, both Toyota and Honda have so far declined to make any such promises.** Honda is the world's largest engine manufacturer when you take its boat, motorcycle, lawnmower, and other engines it makes outside the auto market into account. Honda competes in those markets with Briggs & Stratton and the increased electrification of lawnmowers, weed trimmers, and the like.

Wimmer noted that while manufactures have announced ambitious goals, *just 2% of the world's cars are electric at this point*. For price, range, infrastructure, affordability, and other reasons, buyers continue to choose ICE over electric, and that's even when electric engines are often subsidized with tax breaks to bring price tags down.

The scale of the switch hasn't even been introduced into the conversation in any systematic way yet. According to FinancesOnline, there are 289.5

million cars just on U.S. roads as of 2021. About 98 percent of them are gas-powered. Toyota's RAV4 took the top spot for purchases in the U.S. market in 2019, with Honda's CR-V in second. GM's top seller, the Chevy Equinox, comes in at #4 behind the Nissan Rogue. This is in the U.S. market, mind. GM only has one entry in the top 15 in the U.S. Toyota and Honda dominate, with a handful each in the top 15.

**Toyota warns that the grid and infrastructure simply aren't there to support the electrification of the private car fleet. A 2017 U.S. government study found that we would need about 8,500 strategically-placed charge stations to support a fleet of just 7 million electric cars. That's about six times the current number of electric cars but no one is talking about supporting just 7 million cars. We should be talking about powering about 300 million within the next 20 years, if all manufacturers follow GM and stop making ICE cars.**

**Simply put, we're gonna need a bigger energy boat to deal with connecting all those cars to the power grids. A LOT bigger.**

But instead of building a bigger boat, we may be shrinking the boat we have now. The power outages in California and Texas — the largest U.S. states by population and by car ownership — exposed issues with powering needs even at current usage levels. Increasing usage of wind and solar, neither of which can be throttled to meet demand, and both of which prove unreliable in crisis, has driven some coal and natural gas generators offline. Wind simply runs counter to needs — it generates too much power when we tend not to need it, and generates too little when we need more. **The storage capacity to account for this doesn't exist yet.**

We will need much more generation capacity to power about 300 million cars if we're all going to be forced to drive electric cars. Whether we're charging them at home or charging them on the road, we will be charging

them frequently. Every gas station you see on the roadside today will have to be wired to charge electric cars, and charge speeds will have to be greatly increased. Current technology enables charges in “as little as 30 minutes,” according to Kelly Blue Book. That best-case-scenario fast charging cannot be done on home power. It uses direct current and specialized systems. Charging at home on alternating current can take a few hours to overnight to fill the battery, and will increase the home power bill. **That power, like all electricity in the United States, comes from generators using natural gas, petroleum, coal, nuclear, wind, solar, or hydroelectric power according to the U.S. Energy Information Administration.** I left out biomass because, despite Austin, Texas’ experiment with purchasing a biomass plant to help power the city, biomass is proving to be irrelevant in the grand energy scheme thus far. Austin didn’t even turn on its biomass plant during the recent freeze.

Half an hour is an unacceptably long time to spend at an electron pump. It’s about 5 to 10 times longer than a current trip to the gas pump tends to take when pumps can push 4 to 5 gallons into your tank per minute. That’s for consumer cars, not big rigs that have much larger tanks. Imagine the lines that would form at the pump, every day, all the time, if a single charge time isn’t reduced by 70 to 80 percent. We can expect improvements, but those won’t come without cost. Nothing does. There is no free lunch. Electrifying the auto fleet will require a massive overhaul of the power grid and an enormous increase in power generation. **Elon Musk recently said we might need double the amount of power we’re currently generating if we go electric. He’s not saying this from a position of opposing electric cars. His Tesla dominates that market and he presumably wants to sell even more of them.**

Toyota has publicly warned about this twice, while its smaller rival GM is pushing to go electric. GM may be virtue signaling to win favor with those in power in California and Washington and in the media. Toyota’s addressing reality and its record is evidence that it deserves to be heard.

**Toyota isn't saying none of this can be done, by the way. It's just saying that so far, the conversation isn't anywhere near serious enough to get things done.**