

THE
ECONOMIC
CLUB OF
CHICAGO

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On February 6, the Club held its annual Auto Show Media Preview luncheon, this year featuring Cody Thacker, head of electrification at Audi of America. After delivering remarks, Mr. Thacker joined by Club Second Vice Chair Mary Louise Gorno for a moderated Q&A.

Below are excerpts from the conversation:

On the current market and projected figures for electric vehicles...

“It took a full five years to sell the first million electric vehicles [EVs]. After that, it took a year and a half, and then 10 months, and then six months, and then under six months. Today, there's been over 7 million EVs sold across the globe, truly astronomical number, given that in 2011, no market existed. By the end of 2020, we expect we'll reach the 10 million mark. Now we're to a point where a million EVs will be sold across the globe every four months, and this is just the beginning, it only accelerates from here. Let's take a look at the US in particular, and where we compete in the premium segment. [...] I pulled these particular numbers from Bloomberg New Energy Finance, it's predicting that EVs will take a 60 percent share of the US market by 2040. If you multiply that across the size of the industry, that's 9.7 million EV sales per year in the US by 2040.”

On the consumer barriers of entry regarding EVs...

“One is cost. EVs still carry a significant price premium over their combustion engine counterparts. Second is range. Consumers expect, and fairly enough, that their EV will get equivalent range as a combustion engine vehicle. Third is charging. There is a serious need for public charging infrastructure to be deployed more widely in the United States. And fourth, is a topic that I'll call apathy. Which is, we want to think that people are driven by environmental considerations when making a vehicle purchase, but the fact of the matter is, they're simply not.”

On the barriers to EV adoption on the producers side...

“Not all of the barriers to EV adoption are on the consumer side. We as OEMs [Original Equipment Manufacturers] also have a much more complex ecosystem that we're navigating that has to be solved before EVs can go mainstream. Here's the status quo – a really simple formula. For the vehicle to interact with its ecosystem, we just need to know two things: fuel type, is it gas or diesel? [Second] What's the octane rating? Then the vehicle perfectly bolts into its ecosystem. Tomorrow, this is the ecosystem that we have to navigate. Lots of stakeholders, lots of nodes, lots of communication protocols, lots of things to potentially go wrong. And bedfellows that we've never had to talk to before utilities, homebuilders. I only put this up to scare you with the complexity but done right, if all of this talks, the EV ownership experience will be markedly better than fueling the vehicle that you know today.”

On EV developments that are a cause for hope...

“First, public charging station infrastructure. Today, there's a site called alternative fuels data center, where you can see real time, how many public charging stations are coming online. I checked this

morning, so latest stats, 24,000 charging stations in the United States with 76,000 charging outlets. To give you context, there's 168,000 gas stations the United States today. So public charging infrastructure is catching up and catching up fast. What we're seeing is a lot of the newly deployed equipment is reaching higher and higher charging speeds. Second, is battery price. If you look back to 2010, so just 10 years ago, the average price-per-kilowatt hour at the pack level for batteries was nearly \$1,200. [...] Today, at the pack level, battery prices are about \$156 per kilowatt hour. In just 10 years, there's been an 87 percent reduction in battery pack cost. We expect by the end of 2020, at the pack level, [it will be] \$135 per kilowatt hour. Where things really get interesting is if you look out to 2023 to 2025, you hit this magical threshold at \$100 per kilowatt hour. At that component price for the battery pack, you can then offer an electric vehicle that's at price parity with its internal combustion engine counterpart.”

On the significance of price parity between EVs and internal combustion engines...

“Then you will have two vehicles on the showroom floor for the consumer to consider. You have the electric vehicle, instant torque, incredibly high horsepower, very attractive zero to 60 times, quiet ride, low cost to own and operate, and is great for the environment. And next to it for the same cost, the combustion engine counterpart, that you have to go to the fuel station to fuel. You can't fuel it at home, pollutes the environment, comes with higher cost to own and operate. At that point, I think the market reaches its tipping point and the conclusion of the average buyer will almost always be that the EV is the way for me to go.”

On driving habits among Americans and “range anxiety”...

“If you look at actual consumer behavior, in the United States, people drive about 30 miles per day. If you asked an Audi SUV owner today, ‘How much do you drive?’, they actually get very close to this. They'll say, ‘About 30 miles.’ But if you ask an EV driver, ‘How much do you drive?’, they'll overshoot it and they'll say, ‘50 miles.’ What that's reflecting, in numerical form, is range anxiety. It's that people who are new to EVs have range anxiety, which is very real, and has to be addressed. Just a week or two ago, AAA published a study which I think is our best glimmer of hope yet. Nearly 100 percent of 40,000 respondents in their survey said that they would buy an EV again. Which says that they're having a really great experience. In the AAA study, they found that people who have range anxiety are typically non-EV owners. Once you become an EV owner, the range anxiety disappears. How I would make sense of that is to say, what you realize is probably what your actual daily driving habits are. When you only drive 30 miles per day, a vehicle with 200-250 plus miles of range then becomes very practical for your lifestyle. [...] If you look at the National Household travel survey, 98% percent of trips in the United States are under 50 miles. So, it is indeed a rare occasion where you're traveling more than 50 miles.”

On mobility as a service and how that will impact the automotive industry...

“Now we've gone from the Ubers and the Lyfts of the world, to more creative mobility as a service offers. Scooters, bikes, all sorts of transportation options that you can now subscribe to. The glaring stat here that's quite amazing to see, is there are now 1.3 billion global users of digital ride-hailing services. Mobility as a service over the last 10 years has been proved out, and will continue to gain share over the next 10 years. That's when we see electric vehicles and connected vehicles cement themselves in the marketplace.”

On what to expect in development in the coming decades...

“In 2030s autonomy takes root. To give you a sense of the testing that's already happening in California, 3.6 million miles of autonomous road testing has already happened and that's a small fraction of total

testing. Most of it is happening in a virtual environment. Then lastly is where we hit the mobility singularity sometime in the 2040s. That's where these aggregated, connected, autonomous, electric platforms with high utilization arise little to no labor cost, very low maintenance cost and the price of transportation plummets for the consumer.”

On what will define success in the automotive industry of the future...

“The horse that wins in this race is the horse that figures out how to have this shared platform with very low operating costs that can span any number of consumer uses and that's available on demand, so that private vehicle ownership is less of a need. If you can crack that, you've got a big stake in that \$7 trillion industry that's emerging.”