**Our Expert :
Allen Levenson****Independent Consultant****About Our Expert:**

- Senior Partner at motormindz, Inc
- Head of Sales, Marketing & Brand Analytics, Chief Data & Analytics Office at General Motors Company (February 2019 – March 2023)

Allen Levenson is a trusted board member, consultant, and automotive industry expert with 30+ years of experience spanning OEMs, public dealer groups and technology vendors. At General Motors, he drove the adoption of data-driven advanced analytics to enhance decision-making and significantly improve sales and profits. In this role, he advised the Chief Digital Office, EV Operations, the Chief Marketing Office, Retail Sales and the 4 GM brands (Chevrolet, Cadillac, Buick, GMC). Currently, he advises automotive and mobility companies through roles at AMA, motormindz, and iSOCRATES, leveraging his expertise to help organizations thrive in a rapidly evolving industry.

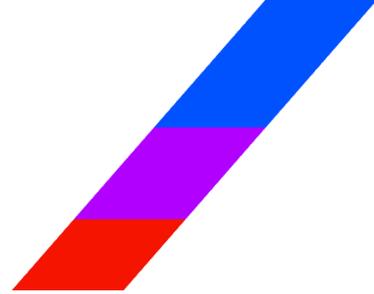
**Moderator:
Max Le Sieur****Founder & Managing Partner at Rosemont Legacy**

- Founder & Managing Partner at Rosemont Legacy
- MBA, Harvard Business School 2022
- Investment Banking Associate at BMO Capital Markets (07/2016 – 08/2020)

Expert Insights On:

- Growth rate for the Electric Vehicle category
- Factors impacting market growth
- Powertrains of the Automotive market and respective growth rates
- Autonomous driving and its relationship to the EV market
- Profitability and costs within the segment
- Risks of investing in the Electric Vehicle market
- The biggest gaps in North American charging infrastructure
- Impact of populist movements across the world
- State of China in the global market and their impact
- Expectations of tariffs and potential impacts
- Current state and outlook of the original large US OEMs

Introduction



Max:

Hi, Allen. My name is Max, and I'll be leading this call on behalf of VISASQ and Coleman Research today. As you know, the purpose of the discussion is to learn about the EV market, including key players and trends in the industry. Before we begin, I do want to remind you that we are in no way soliciting any material non-public information or any information that is confidential related to any company or organization that you are currently or have ever been affiliated with.

If you feel as though the answer to a question or a series of questions involves any non-public information, please tell me right away, and I'll take us in a different direction. Does that make sense?

Allen:

Yep, no problem whatsoever.

Max:

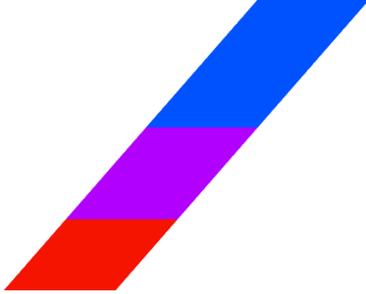
Okay, great. With that being said, would love to have you provide a very brief introduction, so if you don't mind just providing a short overview of your background and experience as it relates to the EV market.

Allen:

Sure. Let's see. I started my career as a consultant, worked with Bain and McKinsey, and started working in the automotive space back then. After coming up the world of sales and marketing, for the last 25 years, I have been in the automotive space. First, the chief sales and marketing officer with Asbury Automotive group, one of the six publicly-traded dealer groups in the United States. I spent a lot of time during that tracking overall industry. It was during the time when we were private and became public, so always needing to do the road shows with investors, and put out a lot of trends with growth in the industry.

So, that was when I started with that for about after nine years of that. For about eight years, I ran a smaller company that helps car dealers mine their customer database and do very targeted marketing, so again, got data-driven following the market. Then for five years, I was part of General Motors' chief data and analytics office, which was a new or centralized data and analytics function. My responsibilities there included helping the global marketing office, the sales office, the four brands in the U.S., Buick, GMC, Cadillac, and Chevrolet as well as the EV group utilize data and advanced analytics to drive decision-making.

Overview & Market Outlook



Allen:

For the last year or so, I have been consulting to the industry and spending a lot of time in both EVs connectivity, and so between all of them, I have, I think, a pretty solid understanding of the overall market, ICE vehicles as well as EVs, as well as hybrids. One of my projects I ran was my team was responsible for understanding penetration rates by different demographics, different people, all sorts of things to help provide guidance to our global marketing team, chief marketing team to help figure out with their advertising strategy. So between it all, I think I should be able to provide a pretty thorough understanding of where the market's been, where it is, and where it's likely to go.

Max:

Cool. Thank you for that. So, diving into the first topic we have on the agenda here, overview and market outlook. So, what's the way to think about the growth rate for the EV category, and how has it evolved?

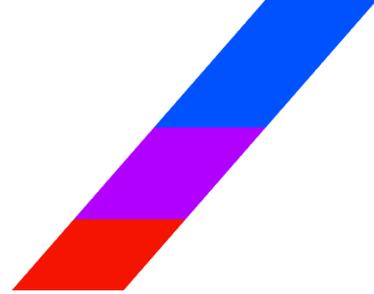
Allen:

Sure. I think by all measures, the EVs sold in the United States and the world for that matter has been an interesting journey, not only over the last couple years but for decades. People started literally 20, 30 years ago, and there's been a number of misstarts with EVs. Finally, the technology got to a point several years ago that it really looked like it was not only going to be here but the future with many people predicting literally the end of the ice age, if you will, and of internal combustion engines, and certainly a lot of people talking about 50% of all sales being EVs by the end of the decade.

So, it was fairly slow for quite a few years. Finally, last year, 2023 is when the industry and EVs took hold. Obviously, there was one player having success, Tesla prior to that, but last year was when it really started to take hold, and it looked like we had really hit that inflection point. We saw in 2023 about a 50% increase in EV sales versus 2022, whereas 2022 was about 5.2% of sales in the U.S. were EVs. In last year, it was about 7.6%, and, again, that's with a 52% growth rate. That said, that growth has slowed pretty dramatically this year. We can talk about in a minute why that is.

So, where I think everyone finally felt we're there and we've hit that inflection point, and we're now on our way to that 50% of sales, it slowed. So whereas we had a 52% increase in 2023 versus 2022, in Q3 of this year, sales only increased 11% with about 8.9% market share.

Overview & Market Outlook



Max: Got it.

Allen: So, now that's nothing to sneeze at. That's still an increase, and 11% isn't horrible, but it is quite a bit different than 50%, and I think certainly a lot less than what everybody was expecting.

Max: Let's talk about the factors, the bullish factors, and then we'll talk about the slowdown after. So, what are the factors driving the growth primarily?

Allen: Okay, sure. If you don't mind, Max, I just want to add one qualifier.

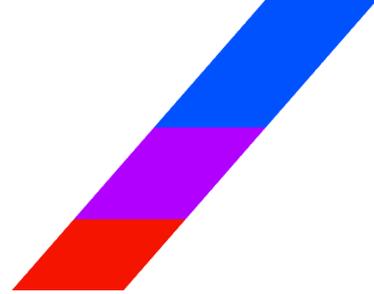
Max: Sure.

Allen: I think everybody should be thinking of what we're talking today primarily is full EVs. Do keep in mind that... That's the one where everybody projected the main growth. Let's keep in mind there are two other powertrains that you need to be thinking about. One is less important is the plug-in hybrid, and that's one that comes with dual engines. It's got a gas engine. That on average gets, each one's a little different but call it about 25 miles... Excuse me, that has an electric engine that can get about 25 miles on pure electric, and then after that, the gas engine is there to get you up to a range of, call it, 350 or 400 miles. That's a nice offering for people that drive back and forth to work five miles a day, and so they're never needing to go into the gas.

Those, however, have never been significant. People that like them like them, but that's only about 2% market share. The other one that we do need to be thinking about is what's just called the hybrid engine. You may think of it the original one to come out with that was the Prius, and that one, there's no gas engine. It's not a plug-in, though it regenerates... Excuse me, it goes on gas, but it regenerates from breaking and such. So, there is no plug-in aspect to that. Those have been the big winner, and those are accounting for actually a little bit greater market share even though there's far less models out there than the full EVs somewhere in the order of around 10% this year.

So, part of the answer when we talk in a minute about what's impacting the growth, particularly not being as fast, is that there's been a lot of growth in that hybrid technology.

Overview & Market Outlook



Max:

Got it.

Allen:

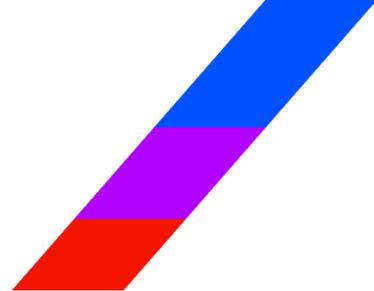
Going back to your question now, so just with that in the background on full EVs, which is really the one getting all the attention and people think is likely someday to be the leading powertrain, a number of factors that have driven it up, one is just a vast proliferation of models out there. Today, nearly every OEM has brought models out on the market, and again, several years ago, it was literally Tesla and then just a handful of folks, so less than 10% market share amongst all the others. Today, General Motors has now got quite a few models, Kia, Hyundai quite a few models. Ford's got several, Volvo, Audi.

I will say there's a couple that have been slower to the game. Nissan, Stellantis, Mazda, Subaru, a little bit slower. Toyota has been the big winner with the hybrid technology. They've been at it forever, and they really invested heavily. As a result, they've just been incredibly strong. Honda is, well, a little bit in between. So again, what's driving it up? One is the proliferation of models. Two is pricing. In the early days, EVs had a very significant price premium over ICE vehicles. It was just a newer technology that really weren't at scale yet, and so that just scared a lot of people even if there was a perception of a lower cost of ownership, because the cost of electricity being less at least today than the cost of gas.

While that has hurt, what's driven it up is pricing has come down, and as there's been a proliferation of models, pricing has come down. This year, in fact, there has been enormous incentives from virtually every OEM. Tesla's had to cut-price pretty significantly on all their models over the last year or two. An average day supply of vehicles that OEMs like to have as 60 days is considered a 60-day supply of vehicles is considered pretty normal and healthy. Today, we're running somewhere in that area for ICE vehicles, but we've been running well over 100-day supply for a lot of the EVs.

So as a result, there has been very significant incentives from almost all the manufacturers. Obviously, you have to talk about subsidies. There's been a variety of both federal and sometimes at the state level incentives for people to either buy or lease an EV. The most common one has been this \$7,500 per vehicle. That's changed at different times over the last couple years. You were allowed so many of those by manufacturer, and then once you had sold that many, that manufacturer no longer got it. It was brought back by the Biden administration in a different way about a year or two ago, but it was more based on where the vehicle was manufactured. If it had primarily U.S. content, it qualified for the full 7,500, a variety of things, but that's been a very big driver.

Overview & Market Outlook



Allen:

Third is the range. There has been this enormous thing called range anxiety, people concerned about how far that vehicle can go, because filling it up if you will, charging it is not the same as just going to a gas station, which you can find pretty much anywhere in the country or the world for that matter. So, a lot of the early EVs were getting somewhere in the first 75-mile range. Then over the last couple years, the 250 to 275. These days, you're starting to see quite a few that begin with a three and in some cases a four. That's now starting to give people a little bit more comfort that they can drive and find a charger somewhere within that timeframe, that mileage frame.

So, that certainly has helped. Then I think the last piece is the charging infrastructure. I'm going to talk about that as both on the good side and why it's driven growth, and on the bad side, why it's still kept us away. The charging infrastructure is getting better each month. There are more level three chargers, which are the fast chargers, and there's been a lot of focus from OEMs, from governments, from different companies. There's more level two which you might have at the mall or at your home, and that has helped.

I guess the last piece of that would be the speed at which a vehicle charges that technology while still not where it needs to be. It's still not at that 10 minutes call it the equivalent of filling your car up with gas. It is getting better so that in 30 minutes, you can get in some vehicles as much as 75% of the full range. So, those are all things that have been good over the last couple of years that have been driving EV sales up.

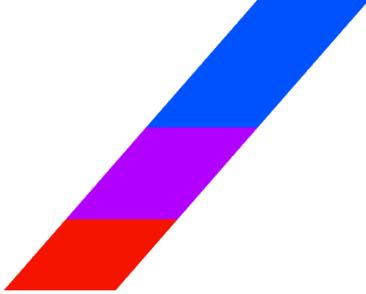
Max:

Got it. Super helpful. What about the slowdown?

Allen:

Okay, so what's kept it from happening? Well, one is, I just mentioned it, the range, but what I mean by that is... I'll also say the charging infrastructure as well, which are related. Obviously if there was a great fully complete charging infrastructure and speed of charging, then you wouldn't need as much range. What's happened is most people that are buying EVs are happy with them. Generally speaking, the vast majority like them. They like the experience of not having to put gas in their car.

Overview & Market Outlook



Allen:

The folks that really do great with it, they have a charger at their house, so they just plug it in at night. If you don't have a charger at your home, or live in a house where you have access to a charger, and you therefore need to rely on the public network, that's a very different ownership experience. Obviously, those that have a second vehicle in the house, that's likely an ICE internal combustion also makes for a much easier driving experience. So if you are going to go on that long trip, you don't need to worry, and you can take your ICE vehicle, but that's not everybody.

So, while most people have been pleased, there have been some bad stories out there, and you hear anecdotes somewhat frequently. I was driving here from... I'm in southeast Michigan in Detroit up to the Traverse City, and needed to get off, and there were apps that show you where you can go when you get to the mall, and the charger doesn't work, or there's somebody in the charger using it, and they've been there... They're in shopping, and they've been there for an hour, and then you go try and find another one, and the handshake, if you will, between your vehicle and the credit card that you need to put in doesn't always work, so the software.

There was a pretty major story that got a lot of press last year when the weather got very, very cold in Chicago for an extended period of time. The driving range could dissipate as much as 50% we were seeing in some vehicles. So, everyone was waiting in line. There were huge waits. They were running out of charge while waiting in line, and just some pretty bad experiences. So, that obviously scared away a lot of people. Again, that time to charge still isn't there yet. I think where you'll start to see major growth is when we get to ranges over 400 miles, a fairly significant charging infrastructure. It's easy to plug in and get access. It's quick, and then I think you'll start to see those penetrations really take off.

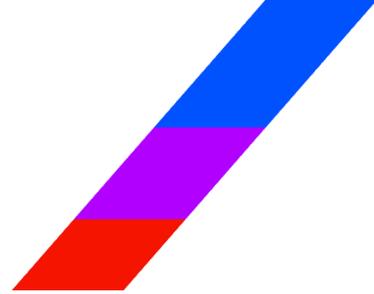
Max:

Got it. That's helpful. Okay, one more very quick question on this topic, and then I'm going to move us along to technological innovation. When we talk about the EV market, what geographies are we referring to?

Allen:

When you say what geographies, I mean, each part of the world does have EV sales. The penetration rates are varying dramatically from place to place. Within the U.S., not surprisingly, you see much greater penetration in the coasts. Folks that are interestingly more liberal, and again, my team ran a project on this, have a much higher propensity to drive EV. So, you're seeing much higher in the coast and in the major cities where, again, there's greater infrastructure versus out in more rural areas where people need to drive further.

Technological Innovation



Allen:

Beyond that, if we're at that 6 to 7% range, excuse me, 8%, 9% on full EVs, China on the other hand, and I think that was one of the topics you wanted to discuss later, has seen enormous growth, and there's been huge focus. Obviously, they've had pollution issues, and there's been enormous governmental subsidies and focus. They're somewhere in the order of 30 to 40% of their vehicles sold this year for EVs. Europe is in between the two. Then there are certain countries like Norway that have really gotten behind it that are much higher. So, it's all over the boards across the world and across the country.

Max:

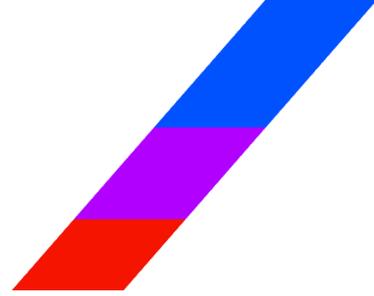
Okay, that's super helpful. That's exactly what I was looking for. Okay, moving on to technological innovation, and I want to be careful not to conflate this conversation too much with self-driving technology. Obviously, well, at least for a beginner like me, it seems like one of, if not the leader in the category is Tesla. Tesla is a leader in EVs but also in self-driving technology, and then you add someone like Waymo. That's also EV and self-driving. So, can you just help us characterize the importance of self-driving technology as applied to EVs, and where it's helpful to separate the two, and where it's helpful to speak of the two as one?

Allen:

Sure. No, it is a good question, and it can get a little bit confusing. You're right. We don't want to conflate two somewhat separate issues, although there are ties. So, I guess the first thing to keep in mind is when we talk about autonomous driving EVs, there are five levels, and an advanced just cruise control, adaptive cruise control is level one. When we talk full, full autonomy, no steering wheel, no driver, and that vehicle can work in all situations without monitoring any issues, that's a level five. The full self-driving that I think you alluded to, which by the way, that's a term that Tesla uses, that's their brand name, is only a level two of driving.

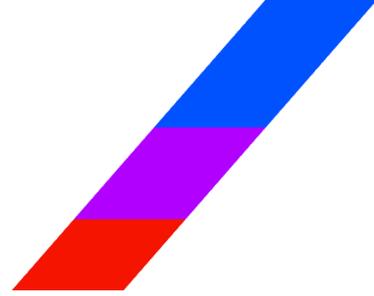
Many of the OEMs refer to it as hands-free driving, and you still have to be very alert. You have to keep your eyes on the road, and it only works on a percentage of the roadways across the country. You are correct that Tesla has probably the most vehicles on the market with that level two autonomy, but there are quite a few others. General Motors, Super Cruise has been around for quite a while. Many people actually say it's a better technology. Ford now has one. A number of the Germans have it. So, there are quite a few. By the way, most of those are on ICE vehicles. You don't need to have an EV to have even level two autonomy.

Technological Innovation



- Allen:** That said, it is much cheaper given the EVs are basically supercomputers on wheels. It is lower cost. So, you will start to see more and more of EVs having level two and then eventually level three. It looks as though just about any vehicle that's being worked on today to have a Waymo or a Cruise or Tesla's true full self-driving vehicle level four, level five, those will all be on EVs. So, that's where the tie is. For whatever it's worth, I'll just state I personally don't love the Tesla referring to it as full self-driving, because it really isn't.
- Max:** Yeah, because it's a misnomer.
- Allen:** Yep. Yep. Yep. That's the link between the EV and autonomous vehicles.
- Max:** So, is part of the penetration of EVs due to this technological advancement? Like, to the extent some of the EV penetration is driven by Tesla, and Tesla has or had an advantage with regards to driving help, could part of the penetration that you described earlier across markets be due to technology or not really because ICE vehicles also have the technology, and therefore it must be... It's like it's really easy penetration.
- Allen:** I would say if you asked people who have been buying Teslas in great quantities, volume, for the last five years, the vast majority would not mention full self-driving as the reason for buying an EV or a Tesla. In fact, they've struggled to sell that at the rates they'd like. I worked at General Motors who was early player with Super Cruise, very well rated by customers but still has just not been the penetration at all that they'd hoped. People like it, but it's expensive to offer. It uses a lot of data and a lot of transmission of data and technology.
- It's limited number of roads. So, it's a nice to have. I would not at all say it's the main driver. The only caveat I would say is there is a small segment of customers out there who really do like it. People that are on long drives frequently for work or whatever, they do find in their on highways that are part of the system, they do like it. So, there is definitely a segment out there, but I would not say that's the driver, if you will.

Investment Opportunities & Risk



Max:

Got it. So for the purpose of this conversation, we should think about self-driving technology as one dimension across which OEMs that offer EVs are competing, but it's not the main driver for adoption of these new vehicles.

Allen:

Absolutely. If you think of major trends in our industry in the automotive space, EVs is a major trend. AVs autonomy is really a separate entity where many people think the world is moving. Again, the last piece I just alluded to and I think is important is if and when we do get to mass adoption of autonomous vehicles, even at level four, those will all be on EVs at least today with the current technology. So, if that ever does take off, that should have major implications on EV market share. Again, think of that future world is likely to be... If we can truly get to level five or even level four with great confidence, ownership of vehicles would drop dramatically.

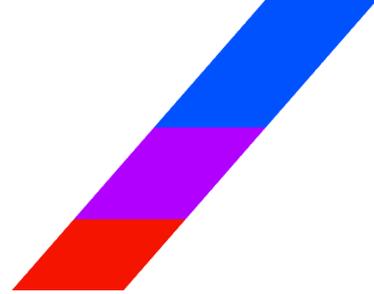
You would walk out of your house, and just plug into your phone and say, "I'm going to work. Send me a small car," versus tomorrow, you're going with the kids somewhere, and you say, "I need a minivan," and all those show up within a minute's time. If we get to that level that there is full autonomy, and there is car sharing and ownership drops, that could have a pretty big implication on EV penetration. But, the truth is we're not there yet. Waymo is probably the furthest along, and as you've probably seen, they are testing now in San Francisco and Phoenix.

I think they recently added a couple other cities. Cruise, a little bit. So, there are growth happening, but we're still a number of years away from that. Even this level five, I don't know, it's getting that last... Getting 99% on autonomy seems very achievable. That last 1%, getting the vehicle to be able to figure out some of these major, major issues, is turning out to be pretty problematic.

Max:

Got it. Super helpful. So, I don't want to get sidetracked too much into the AV conversation, so I'm going to move us along into risks and opportunities within EVs. So from a business perspective, how is the margin profile different for electric vehicles, and are there different profitability or business model considerations when it comes to EVs relative to ICE vehicles?

Investment Opportunities & Risk



Allen:

Sure. The most important thing to keep in mind in the automotive space industry is scale is hugely important. These factories are large. There's a lot of fixed costs, a lot of people. So, the ability to churn out two, 300,000 vehicles out of a factory, keeping that thing running 16 hours a day, in some cases, three shifts, 20 hours, 24 hours a day. When you can start doing that, you can really get economies, and bring your costs down. The flip side of that is with any vehicle, whether it's EV or otherwise, as you're starting to build, you have much higher cost structures.

Then, so just with that in mind, right now, EVs are still a relatively new, low penetrations, and the only OEM who has managed to attain scale has been Tesla. Tesla is literally the only OEM who to date has managed to make money selling EVs. Obviously, that will change over time as you start to see others getting to 200,000, 300,000 volumes out of one particular model and one factory. But to date, we haven't seen that. So, the losses across literally every other OEM have been enormous often in the order of tens of thousands of dollars per vehicle sold. The Ford broke out their whole EV business from their core ICE business, and that thing has been losing billions of dollars.

Max:

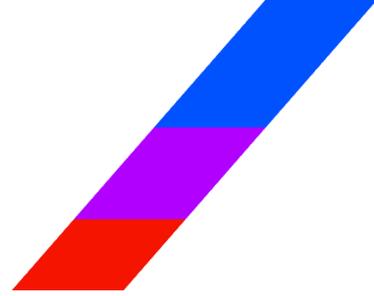
Allen, on this point, what would you say is the breakeven volume? What is the level... You mentioned 200, 300,000. Is that the level per model per company where scale starts to make sense, roughly speaking, in your opinion?

Allen:

It's hard to give an exact answer, because it's a little bit a function of exactly how many models that you can have running on a lot of shared technology. So, General Motors, for example, has built out what they call their Ultium battery platform, and they're sharing that platform across a lot of EVs. So, when they start to get to three, 400,000 across a number of different models, across Cadillac, Chevy, GMC, then they'll start to see their costs come down, and their investments that they've made. They, by the way, have said that they are starting to get to that stage.

They're probably the second OEM to get there. I would say Hyundai Kia would be next. So, they are moving in the directions, and might in fact start to get to profitability in 2025 on their EVs. But again, just as an example, many of these EV pure plays have come and gone already. Lucid, Polestar, and Rivian have "made it," and that they're still around. Rivian has had some degree of sales in the order of 60, 70,000 vehicles. Rivian has lost \$30,000 plus on every vehicle sold. So, that just gives you a sense. Again, they're the number two in market share.

Investment Opportunities & Risk



Max: Why are they so expensive? What's happening in the cost structure? Is it just the fixed costs are so high to build out that "platform" that's reusable in all these vehicles?

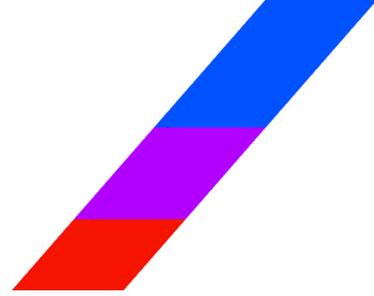
Allen: I mean, it's a couple of things. One, it's just, yes, it's a new platform. The batteries are new, and you're needing to build very significant battery factories, and invest very heavily in the technology. So, there's just a lot of upfront costs. Again, coming back to my comment, when you're selling these things in 10 thousands and 15 and 20 and 30, that's just not enough until you start getting to 100, and 200, and 3,000. So, new technology... Also, the chemicals that go into them, the lithium and some of these other rare minerals have become fairly costly as mining sources get better, or right now they've gone in the reverse direction as there's been a lot of people trying to scoop up access to supply.

So, you've got those issues. Ultimately, when you have gotten through that investment, upfront investment, and you're getting to volume, there is a good likelihood you will see higher margins, because these vehicles do have less parts. They don't have all of the filters and a lot of things. So, the sense is you can get to a point, and they will that they should become profitable and actually have a lower cost to build. But again, we've just got to get to scale to get there.

Max: Got it. What are the biggest risks if someone was looking to invest in an EV company or even an OEM looking to invest in building out an EV platform? What are just the risks to investing in EVs generally? You mentioned a few companies earlier that are still around. There's obviously some that have gone bankrupt and come and gone, like you said. What are those risks that are particularly difficult for this category?

Allen: As with any transformative technology, they do ultimately end up being just that transformative, but it takes a while to get there, and there are a lot of winners and a ton of losers along the way. I mean, if you think of the internet, that completely transformed our world, but there were hundreds of thousands of companies that came and went bust, and a small number of Amazons who have made it. So, as with any newer technology, you have that. In this case, you have a fairly significant infrastructure requirement that is somewhat out of your control, and that's the charging infrastructure.

Investment Opportunities & Risk



Allen:

So in addition to needing to invest in your own vehicles and your own connected vehicle connectedness and your own chargers, your own batteries, you also do need that whole charging infrastructure, and no one OEM can drive that. So, there have just been a ton of companies that have come about into that space, and quite a few that have already left in the charging infrastructure. Interestingly, one of the other major transformative technology out there these days is AI and GenAI. That actually could have a major impact, because the cost of electricity. Originally, the theory was electricity was plentiful and lower cost than gas.

Right now, there are concerns that we aren't going to have enough electricity to fuel all of the AI needs coupled with if you have 20, 30, 40% of the EVs on the road. So, that could actually drive up the cost of driving an EV. Obviously, there's a lot of infrastructure investment happening there, but again, that's out of the control of many of these companies that might be coming. So, the truth is in order to be successful, you need access to capital. Right now, the IPO market has been very difficult, particularly in the mobility space. A couple of years ago, anything with EV or AV was able to get funded, but that world has not materialized as expected, so that's been very difficult.

As a result, the VC world has become much more difficult given there aren't as many exits, so just the overall access to capital. What could happen with chemicals and minerals, particularly in different governments and some that might not be as friendly to the United States? That could have an impact, how we think about China, government regulations, having a new party in power. All of these things are risks that you need to think about as you're investing in this space.

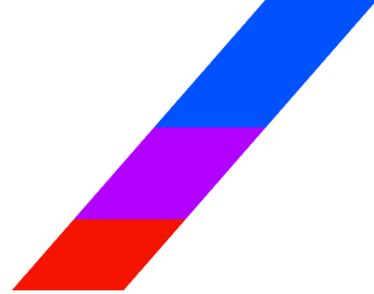
Max:

Okay. So, I want to touch on China and tariffs in a bit. Before that, what is your opinion with regards to what needs to happen with charging infrastructure to improve the outlook for EVs? What is the biggest gap, or what are the biggest gaps in charging infrastructure? Let's maybe focus on North America for this question.

Allen:

Okay. It does vary dramatically from different parts of the world. Norway and China have invested much more heavily. In the U.S., a couple of things. One, we just plain need more. It's as simple as that. There need to be more public chargers, and there also need to be more home chargers and therefore at a lower cost, and just get those out there. That is happening. I think any new home built in certain states have to have a charger built in, and it's much, much lower cost to build it versus retrofitting. Can be thousands of dollars to retrofit one into your home.

Investment Opportunities & Risk



Allen:

So one, we just need more. Two, we need a much more reliable network. If you think about ones that are at the malls and all that, there's nobody that's really responsible for upkeep on those. Whereas if you go into the local Exxon gas station, if one of their pumps is out, they're going to fix that thing immediately. That's their business. Whereas, the mall owner may or may not be thinking about it. They may have a third party running it. So, much greater reliability needed. Third, we need to figure out and have some technology that helps with the rules and the process for charging.

What I mean by that is we still haven't quite figured out how long a person can keep their car at the mall, and then go shopping, and after 20 minutes, what happens? If their car is 70% charged, how do you find them, and do you tow that vehicle? You pull into the Hilton hotel at night, and the customer plugged in at 10:00. It's now midnight. They're full, but they're not getting up till 6:00 or 7:00 in the morning. As I mentioned before, that handshake needs to get better. Tesla in particular, since it was a closed network, all of their vehicles, they were always known to be the most reliable, the most uptime, and the easiest, just pull in and fill.

Eventually, we'll get that way that your car will pull up, and it'll be connected to some major networks. You won't need to do a thing. The charger will immediately recognize your vehicle as you're pulling in. Your credit card or account will be on file, and there will be none of those issues in the handshake. Then again, the last piece that I mentioned before that relates to the infrastructure is the speed that both the vehicles, and that can take a charge, and the chargers being able to do it. Again, once you start to get to closer to 10 minutes for a pretty significant charge so that there really isn't a significant difference versus today, then I think you're going to see penetrations start to move at that more rapid rate than we're seeing today.

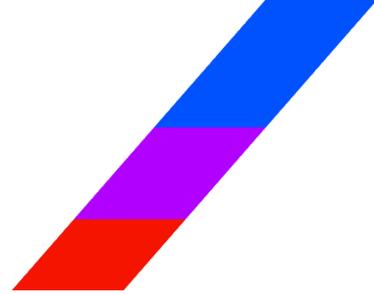
Max:

Got it. That's helpful. Is there a concern that the grid in the U.S. is not ready for the demand implied by converting energy used in ICE engines into electricity?

Allen:

Absolutely. As I mentioned before, as you may recall, our electric grid infrastructure is not terrific, particularly in certain parts of the country. If you remember Texas with heat waves having issues, and so I think a lot of people would say, "We have a somewhat strained system as is today," and you then add on top of that all the demand from AV as well as crypto, which is also very energy intensive, and we might have issues. Now, the only adverse to that is one of the major areas of focus is being able to manage the charge from a vehicle to either power your home or to power the grid.

Investment Opportunities & Risk



Allen:

It's called the V to H, which would be to home, or V to G, which is to the grid, and the theory being that your vehicle, let's say it holds 400 miles a range. You get home at 5:00 from work, and you plug in to get it ready for the next day. Well, that might be a pretty high demand time as people are getting home and cooking. So rather, if let's say that car has got 300 miles of range, literally pull 100 miles worth out of it, and put that onto the grid to use for people's homes, and cooking, and then at 2:00 in the morning while they're asleep, then power that vehicle up. If you can start doing that, you don't need to build that next electric power plant.

There's a lot of people and companies focusing on that. Right now, again, it's new. You're needing to work power company by power company. The technology isn't there yet. Not a lot of vehicles or home chargers have that two-way charging yet, but that can be a real positive once we get that up and running well.

Max:

Got it. That's super helpful. Okay, one more thing on the risks. I didn't hear you mention this, but what about the advent of populist movements across the world from an election, democracy perspective? Does the industry expect that to dampen the appetite for this liberal, green initiative that is EVs, or not really? Is it more about the economics and the practicality of the charging infrastructure, the speed at which it charges, and it making sense for people's wallets?

Allen:

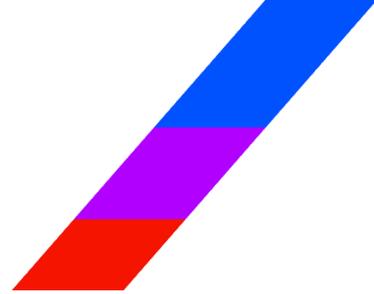
Right. I mean, I would say it is a, the answer is yes, it's important. No question about it. B, I would say it's more the latter, the economics than the politics of what's green. I think there are still plenty of people out there who do believe that saving our climate and our world for our future generations is important, and regardless of who's in power isn't going to matter to them regardless of what he or she is espousing. That said, the focus from those governments on building the EV infrastructure very much ties into the economics of it. So today, that \$7,500 subsidy has been hugely important to "propping up sales."

Without that, let's say we're running at 9% in calendar year of sales 2024. I don't know how much less it would be without the subsidy, but it would not shock me if it was 30, 40, 50% less. There is talk certainly in the United States about that subsidy going away potentially entirely.

Max:

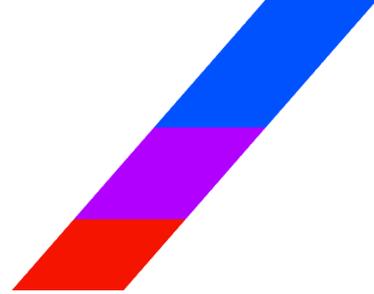
Got it.

Key Industry Players



- Allen:** Then as well, how much focus or effort the government puts on building out that charging infrastructure, the Biden administration has invested a decent amount, not nearly as much as some other countries on building out that infrastructure.
- Max:** Got it.
- Allen:** The last piece I should mention is there have been rules saying the guidelines, not guidelines, rules on any given OEM needs to have a certain percentage of their vehicles being vehicles that are safe for the world and low emission. If they don't have that, they've had to pay penalties. So, there's been this whole carbon offset world that has been out there for companies that aren't hitting their targets, their requirements, needing to buy these carbon offsets primarily from Tesla. So again, if those go away, that also will have an impact. So, there's no question that... Let's just say for the next four years in the United States, we very likely we will see lower overall EV penetration than we would have had there been a democratic administration in power.
- Max:** Got it. Okay, appreciate that. Moving on, Allen, to our last topic for today's key industry players, and where I want to start is China. What's happening in China with regards to EVs? Why is the penetration being so much higher? Have they been just better at advancing the technology? Have they copied technology, and your perspective on what's happening there? Then from there, I want to lead into tariffs.
- Allen:** Okay, so interesting. China has been starting to build vehicles for several decades now. I remember going to the Detroit Auto Show in, call it, 2004, 2005, 2006, and I remember seeing the first Chinese vehicle. It was downstairs, which was where they put a lot of the random vehicles. it was just incredible what just a piece of crap. I remember the seats were made out of what looked like a bird's nest material of bamboo. It was nothing. Then the Chinese started inviting other companies to manufacture there as part of JV's. So, BW, GM, Ford, Stellantis all started partnering and building vehicles there.

Key Industry Players



Allen:

That did lead to the learning and the technology transfer to China so that they were starting to learn from some of the best in the world, and now had that capability. Around 2009, the Chinese government realized while they're gaining and learning that they would never be able to "beat" the rest of the world in internal combustion technologies. So, they decided to set their sights on EVs, and they have put in place enormous government subsidies on not only to the manufacturers of EVs, to all of the component parts, and to really the entire infrastructure. All these different players have been able to get subsidies, and it has been a huge success.

By any measure, Max, you would have to say that the Chinese have leapfrogged the U.S. being able to offer now low cost, much of it driven by subsidies, low cost EVs that have very respectable range, very strong technology. Interestingly, one of the third major trend in our industry besides EVs and AVs is connected vehicles and connectivity. They have also made huge progress on connectivity. So, between all of it together, they have built a very solid number of vehicles in technology at a seemingly whether subsidized or not low cost to the rest of the world. What that does allow them to do is to get to that scale that I mentioned earlier, which is just so crucial in our industry.

Max:

Got it. That's really helpful. So, it sounds like if I have to summarize, it is early investment, an active decision to skip over competing on ICE as a dimension and going straight to EVs, and therefore they've reached the critical scale faster.

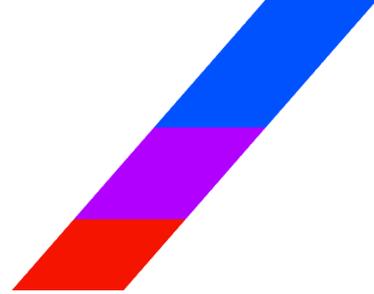
Allen:

I think that is the case, and they have come up with some just really strong technology. Again, don't forget, they've learned how to build vehicles as well over the last couple of decades. Interestingly, I drive a Buick Envision. A couple years ago, it was the only Chinese-manufactured vehicle sold in the U.S. Today, they're, I think... Lincoln has one, and there might be a third. That's it. Now, they might go away. I know you wanted to ask about tariffs, but I have to tell you that the vehicles are very solid and drive beautifully.

Max:

Got it. So, let's move on to tariffs, because it's obviously a hot topic right now. It seems like they have or they will have an impact on the market. So, as just an insider, can you describe where we're at with tariffs? What is the goal of these tariffs, and what are the expected impacts in your perspective?

Key Industry Players



Allen:

I think it's a fair statement to say, particularly in the United States, there is enormous, enormous concern about China, and honestly being able to take over the automotive industry based on the current leadership that they have in the technology, and on the cost side and on connectivity. So, there is very significant worry starting maybe six or so months ago. You may have read recently that Bill Ford drove a Chinese vehicle for six months, and said, a, he didn't want to give it back, and b, that we have a lot to be worried about. So, as a result, there are folks, a, just talking about, "Will we just not allow Chinese vehicles to be sold here due to national security?"

Particularly when you have all that connectivity, the same thing is the issues with TikTok and others. Can Chinese-owned companies be part of Chinese government, and collect data on folks and their driving behaviors and habits? So, one is before you even get to tariffs is will there be regulations that bar China from being able to sell any vehicles in the United States, or open up plants here? B, the second way is do you just put enormous tariffs? Right now, certainly, president-to-be-elect Trump has said that he will have very significant tariffs. Unclear how long that will last. At very large levels, I'm not sure anybody really knows.

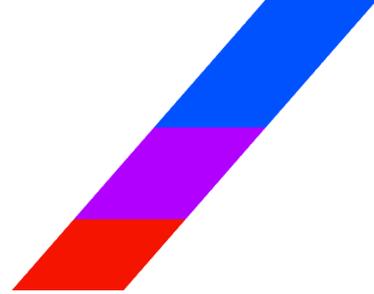
Generally speaking, water reaches its level, and companies do figure out a way in. There's a lot of talk about China building in Mexico, which is obviously part of North America, and has a low cost structure. From that, can they get into the U.S.? So, the answer is I don't think anybody really knows. This is all very hot in just the last couple of weeks since our election ended, but no question, major concerns from a lot of different people that certainly without tariffs or without rules, barring folks here that there...

Whereas, 30, 40 years ago, the Japanese came, and then they started building in the U.S., and gained significant share. Then the Koreans came, and then they started building in the U.S., and gained significant market share. You could certainly say China could be next and particularly in this area of EVs.

Max:

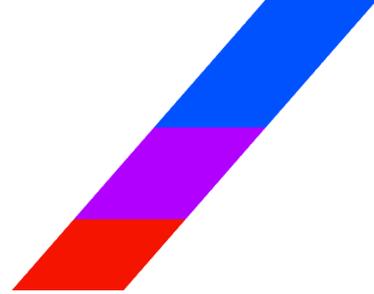
So, are tariffs likely to accomplish that goal of allowing the domestic industry to catch up, or in the history of car OEMs, is that not work, or is that a proven and effective strategy?

Key Industry Players



- Allen:** Yeah, there have been... I'm not an expert in it. There have been some tariffs, particularly on large pickup trucks, which has been the one area that the domestic three have managed to have enormous, enormous leadership, and they have retained that over the years. Part of that might be a function of the tariffs on those vehicles. So, again, I wish I knew more. I think it's called the chicken something, and there's a story to how it came about. So, I wish I knew more, but that, I do believe, has played a role in at least allowing the domestic three to continue to hold significant leadership in that space.
- Max:** Got it.
- Allen:** So, you could argue if that's any indicator. A, it could keep them at bay, and B, with the way you asked the question was appropriate, could it keep them at bay at least long enough for us to catch up and then build scale and economies? So, it might work.
- Max:** Got it. Okay, super helpful. Final question here, Allen. I know we're running out of time, but the original large OEMs domestically in the U.S., where are they at with regards to their EV platforms? Are they competitive? Are they really far behind? Is it important to characterize them differently, because they're at different stages? Help us understand where they are at within the space.
- Allen:** Sure. I mean, overall, most of the "legacy OEMs," before we hit EV, they've had a good couple of years. 2022, 2021, '23 have been good years given their work, quite frankly all of the shortages, from Covid and then the chip shortages. As a result, inventories were low, and when inventories are low, vehicles sell more quickly, and they sell without incentives, and therefore, that's good for the dealers and very good for the OEM. So, all of the OEMs have had a pretty good last couple of years. That said, 2024 is turning out to be a very different year.
- By the way, the OEMs have been cyclical since the beginning of time, and usually tied to the economy, but not always. They'll have some good years and some not as good. It certainly looks as though things are starting to turn for them, both overall, and a part of that being their need to invest in other powertrains like EVs. What's happened, by the way, is they've been using the profits that they've been generating from their ICE vehicles to pour that into EV development thinking that's the future. Now, it's gotten really interesting, because hybrids, as I mentioned before, have been all the rage, and that's what customers seem to want.

Key Industry Players



Allen:

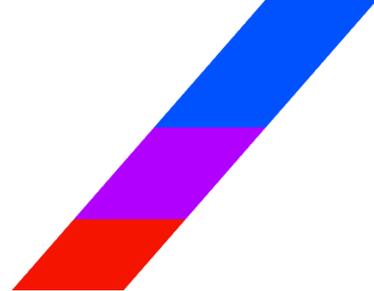
By the way, you can get 650, 700 miles of range out of a hybrid vehicle, and they still have that EV kick at the beginning. So, they're fast. They're smooth. So, now, all the OEMs are coming back and trying to either bring back hybrids that they might have stopped, or that they might have in different parts of the country but don't have in the U.S., or build them from scratch. Then the other issue is most of the OEMs had stopped investing, or many of them had stopped investing in future ICE development. Don't forget, it takes five or seven years to bring a new model to market. Given a lot of the OEMs, Cadillac, Volvo, Jaguar, a lot of them had said they were going to be full EV by the end of the decade.

They all stopped putting any development in ICE vehicles. Well, now that we're seeing the slowing in EVs, they're all doubling back and bringing out the next versions in an ICE. So, they're needing to invest in ICE. They're needing to invest in hybrid, and they're needing to still keep investing in EV. So, between all of that, coupled with we're now getting into a time where things are starting to slow a little bit, interest rates are high, their cash flows aren't quite as strong. Specifically, of the domestic three, GM has been the strongest and is in the best place today. A, driven by having probably the deepest portfolio in the large profitable SUVs, and two, they're probably a little further along in their EV development, so they might...

They're starting to get more out there, and getting closer to scale. Ford would be next. Obviously, they still have the number one selling vehicle. The F-150 pickup is still strong, and they've got some decent hybrid vehicles out there. They've had some measure of success with their EVs, but still not as much as GM. Stellantis is really struggling. They've been very late to the game on both hybrid and EV. Right now, their vehicles are just going through a little bit of a dry stage. Jeep, which has been an enormously profitable brand for the last 20 years, is losing a little bit its panache.

Next, if you go to Europe, right now, all of the European companies are starting to struggle. VW, Mercedes, BMW, the premium category has been very strong for years, for decades. That's slowing a little bit, particularly as a lot of those customers are the ones that are looking at some of these high-end EVs, even the small ones from companies like Lucid and all that. So, they're seeing a little slowing there, and again, all the same issues of having to invest in multiple powertrains. They've got very high cost structures, particularly those that manufacture in Germany. So, there's a lot of issues there.

Key Industry Players



Allen: The Japanese, no question that they've been the strongest. Toyota, who really invested heavily since the beginning in hybrid, has been the big, big winner. The day supply of a hybrid is like something 10, 15 days. So, they're just selling those all at full price, and gaining market share. Honda's probably not quite as strong, but been okay. Subaru has just been a... They've not been in EVs, but they've just been a slow and steady company. Mazda has come back after a couple of years. They've got a nice little brand image, not through EVs. Their EV is coming. They've got a hybrid that's just out.

So, that gives you a little bit of a feel. Nissan, I should have mentioned, is really struggling on their EVs. They were an early player with the Leaf, but it was probably a little too early, only about 50 miles of range early on.

Max: Got it.

Allen: They've just been struggling to find a place, at least in the U.S. market. Then lastly, Kia Hyundai have been very strong. They've done well with their core ICE vehicles. They've actually had some pretty good success, and have arguably some of the best EVs on the market. They've also got some hybrids. So, Korea has been doing well also.

Max: Nice. Allen, thank you so much for your time. I think this is a great place to cap the conversation. Thanks for spending a few more minutes with us today. Listen, I can't think of a better person with whom to have this conversation. This is exactly the kind of insight we were looking for. Thank you so, so much for taking the time, and please enjoy the rest of your day.

Allen: You bet. Thanks, Max. Appreciate it.

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