EVs, Mid-Summer, 2022

By John Benson

July 2022

1. Introduction

This has been a challenging but good year for road-going electric vehicles (EVs) so far as I start to write this paper. These EVs are definitely continuing to increase their volume and diversity, as we covered in other recent posts on this subject, briefly described and linked below:

EVs - Early Summer, 2022: *This post will continue to explore my ongoing theme, and mainly focus of the low end of the EV Market, including exploring how we might get to $25K EV. Section 3 will look at two mid-range EV crossovers that are emerging from a familiar partnership. The last sections of this post will explore fleet electrification by a major utility and others.*

https://energycentral.com/c/ec/evs-early-summer-2022

EVs, Late Spring, 2022: *I started collecting information for this post shortly after I completed my last post on this Subject in March. However the one thing that I didn't have is a main theme. In mid-April I found one, or actually decided to continue with one that I started at the beginning of 2022.*

My theme is the continued staking-out submarkets in the U.S. Electric Vehicle (EV) Market. This is a complex market that includes both the final assemblers of EVs, EV-component manufacturers, and charging infrastructure developers.

https://energycentral.com/c/ec/evs-late-spring-2022

In this post I will describe the ramping of EV production and diversity, and look to the future: what 2023 and later should bring us.

2. Moving EVs to the Mainstream

To move to the mainstream for the road-going vehicle market, EVs need 4 things:

1. Selection: Every significant market-segment must be covered by viable EV designs that meet the other three requirements below. These are described in the next section.
2. Value: EVs must offer much more value than alternative (read: internal combustion vehicles). The greater the value for each segment, the faster the demand will ramp. The current price of gasoline greatly boosts EVs performance in this metric.
3. Support: Each segment must have all of the supporting services it needs in order for EVs to function as well as the alternative. This includes EV Supply Equipment (EVSE, a.k.a. chargers), maintenance, and rebates for early adopters.
4. Production: Production volume of EVs for each segment must continue to ramp up to achieve comparable volumes as compared to the alternative for each segment (at least 25% of overall sales).

Below we will examine what I feel are each significant market segment for road-going EVs, and comment on how quickly each is likely to ramp up.

3. Road-Going EV Market Segments

The markets below are generally divided into two groups: those that are primarily addressing a need by individuals or families, which I will call "Personal EVs," and those that address the needs of businesses, which I will call "Commercial EVs." Although a given design might cross-over from its primary group to the other, the EV manufacturers will mainly focus on each segment's primary group. Thus we will only cover both groups below if there are two substantial markets (for instance "Light-to-Medium Trucks").

I will also use "first generation" and "second generation" in describing EV designs. First generation EV's are largely based on earlier internal combustion (IC) designs. Second generation designs are at least somewhat optimized for an electric vehicle.

3.1. Personal Economy EVs

The good news here is that we addressed the currently available EVs in my last two posts, and those posts are described and linked in the Introduction to this paper. Some of the designs currently in this market are first generation (Hyundai KONA Electric and Kia Niro EV), and one design is second generation (Nissan Leaf). All of these are arguably the mythical $25K EV (read the above linked posts for details).

Also note that the Chevy Bolt has a price in the same range as the above vehicles, but since they have sold more than 200,000 Bolts, the $7,500 federal tax credit has expired for these (and Tesla). Also, Chevy has had really serious problems with Bolt's batteries, and stopped production for a time. The EVs mentioned in the above paragraph still are eligible for the federal tax credit.

The problem with $25K EVs is that they have very low margins, and thus the manufacturers will probably not ramp production to meet demand any time soon. Also the federal tax credit will expire over the next couple of years (mostly driven by volume). It is hoped that more advanced designs can keep the price below $30K without this credit. Perhaps these designs might come from other manufacturers.

3.2. Personal Mid-Size EVs

This is the heart of the EV "car" market, and includes both traditional sedans (like the Tesla Model 3) and cross-over SUVs (like the Tesla Model Y and the Ford Mach E). I would consider the price point for this segment to be in the range of $40K to $60K (base price, without federal or state rebates / credits and before tax, license or EVSE).

The current market for these are dominated by three manufacturers:

Teslas accounted for 61% of all EVs registered in the U.S. in April, the latest month for which data is available. [1]

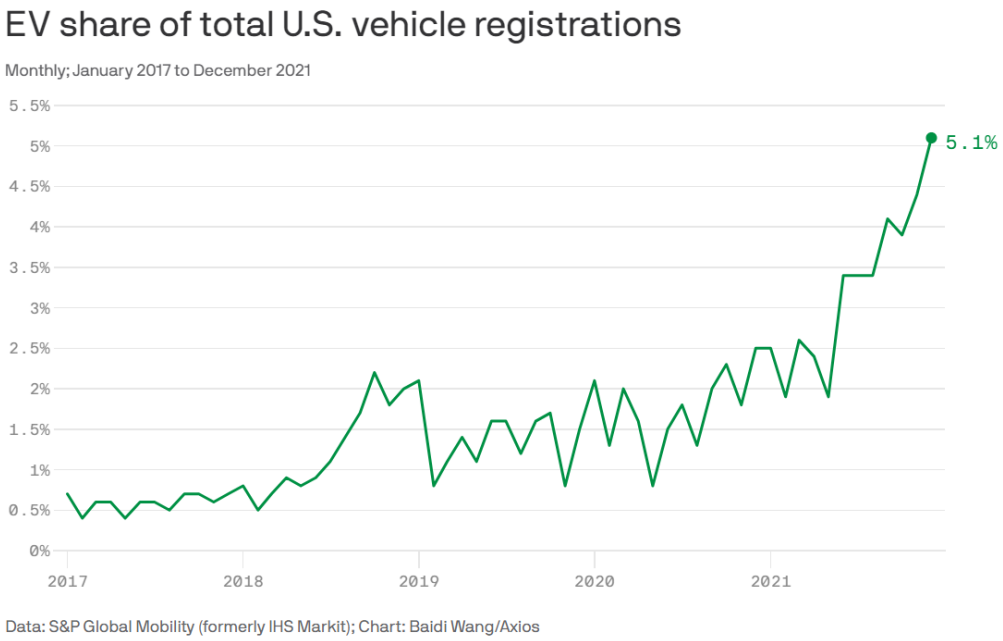
The next closest were:

- *Ford (8%),*
- *Hyundai (6%) and Kia (6%) (both owned by Hyundai)*

[1] Joann Muller, AXIOS, "Tesla's in the lead as U.S. electric car sales get supercharged," June 27, 2022, https://www.axios.com/2022/06/27/tesla-electric-vehicle-ev-sales

Note the Ford EV car sales are currently dominated by the Mach E, which is in this segment, as are a large majority of the Teslas (by number sold). Hyundai/Kia has recent entries in this market, but they have just started ramping.

The following chart (from the above reference) shows the long term growth trend for EVs as a percentage of overall vehicle registrations:



Numerically (by numbers of EVs), this segment currently dominates and will dominate EV sales for the next several years. *Notable launches are coming soon from Honda, Jeep, BMW and others.*

"It will depend a huge amount on the specifics of the product, including the price and the monthly payment," Tom Libby, S&P Global Mobility tells Axios. If GM is able to launch a (Chevrolet) Equinox for under $30,000, that would be competitive."

What to watch: EVs' share of North American vehicles is accelerating and could hit 28% by 2028, and 59% by 2035, per consulting firm AlixPartners.

3.3. Personal Light to Medium Trucks

This segment is a major one for conventional (IC) vehicles but not yet for EVs. *…With 200,000 reservation holders tapping toes in line, dreaming of dusting gasoline trucks, we may take the Ford F-150 Lightning as an example, illustrating just how badly many Americans wanted an electric pickup. So many that even Ford was caught off guard, and is racing to double Detroit production to 150,000 annual units by next year. Darren Palmer, Ford's vice-president for electric vehicle programs, told me Ford also aims to roughly triple Mustang Mach-E production, to 150,000 yearly. That's what happens when EVs go from short-range, compromised econoboxes to fully-realized marvels that make gasoline versions seem nearly obsolete, in everything from performance, pollution and NVH to ownership costs for fuel and maintenance.*[2]

[2] Lawrence Ulrich, Road & Track via MSN, "The Electric Car Industry Has a Supply Problem", June 30. 2022, https://www.msn.com/en-us/autos/news/the-electric-car-industry-has-a-supply-problem/ar-AAZ2Xdz

Demand for the Lightning, Palmer acknowledges, "has shocked everyone," with Ford cutting off further reservations for now.

For more information on the Ford F-150 Lightning, see section 6.2 in "EVs, Late Spring, 2022" described and linked in the Introduction.

But there's a problem: A looming shortage of lithium-ion batteries that threatens to make EV lines even longer, frustrate would-be buyers, and delay the transition from fossil-fueled transportation to cleaner, radically more-efficient means. It's a disconnect between automakers' rosy projections of EV sales and supply-chain reality; a Red Sea gap worthy of Charlton Heston, with no sudden miracles in sight. And it has everyone from Elon Musk to Rivian's R.J. Scaringe sounding alarms, or suggesting things may get worse before they get better.

"We just don't have the manufacturing capacity to match the demand," says Venkat Srinivasan, director of the Collaborative Center for Energy Storage Science at Argonne National Laboratory. "And even if we had a magic wand, we don't have the mines and materials to supply these things, so there's a long-term materials challenge."

On the topographic surface, it might look like automakers have this stuff covered: The Department of Energy counts at least 13 new gigafactories scheduled to rise on our soil by 2025, with about 300 gigawatt-hours (gWh) of new capacity, nearly all in the union-spurning American South. That would be five times today's 60 gWh capacity, with fast-rising EVs now holding about 4% of the new-car market.

Ford alone expects to add 60 fresh gigawatt-hours in North America by 2025 — equaling today's total U.S. output — and 140 by 2030, including joint-ops facilities with South Korea's SK Innovation (SKI) in Tennessee and Kentucky. GM is readying its first Ultium-branded battery plant with South Korea's LG Energy Solution in Ohio, with more to come in Tennessee and two other locations. Stellantis, Volkswagen and Toyota are laying groundwork for their own energizing battery operations. That 300 gWh estimate doesn't even include Tesla's factory in Austin, from which Musk hopes to speed deployment of Telsa's large-format cylindrical cell — the long-awaited 4680, so named for its dimensions — to power its next-gen cars. Tesla, far ahead of the curve to manufacture its own batteries, says it has plenty to support current production, at least until the tardy Cybertruck demands more capacity from Panasonic or other partners.

On May 2, the White House announced it would kick in $3.1 billion to support companies building new battery factories or retrofitting old facilities (plus $60 million for battery recycling), part of the Bipartisan Infrastructure Law passed last year. The Biden administration is targeting 50 percent of new cars to be EVs by 2030. Several automakers are also chiming in with their own ambitious, possibly unrealistic targets for transitioning from internal combustion to electricity.

That's because experts don't see the math adding up. Especially because, as experts like Rivian's Scaringe warn, a U.S. supply chain for batteries must basically start from scratch.

Srinivasan calculates that converting all new cars in America — figure 17 million in a good sales year — to electric drive would require more than 1,500 gWh a year in batteries. That's figuring a 90 kWh pack on average in each car. (The Lightning and Rivian each stuff about 130 kWh into their long-range packs, and a Hummer gobbles up 200 kWh, enough to power three smaller cars.) As things stand, America would need to

boost capacity by a factor of 25 to get there. Using the administration's 50-percent target for 2030 would require 750 GhW, more than double the nation's total projected capacity in 2025 — and that's assuming every last cell would go into EVs. Grid battery storage, which will compete with EVs for capacity, may need 500 gWh or more of its own. Better get cracking…

From the above, it sounds like everyone is on board to solve the battery problems, but let's examine this a bit more.

For the next several years all EVs will need to use Lithium Ion batteries. Although there are other designs under development, most are either alternative lithium chemistries or similar other chemistries.

There are currently four dominant alternative lithium-ion chemistries:

- LFP ($LiFePO_4$ or Lithium Iron Phosphate)
- NMC ($LiNi_XMn_YCo_ZO_2$ or Lithium Nickel Manganese Cobalt Oxide
- NCA ($LiNi_XCo_YAl_ZO_2$ or Lithium Nickel Cobalt Aluminum Oxide)
- LG Chem's new NCMA (Nickel Cobalt Manganese Aluminum, which has the highest nickel content)

LFP is the least expensive chemistry as its component materials are very common and widely available. By the way, this includes lithium, which is used in all other "lithium chemistry" batteries. Thus LFP will be used in the EVs where low battery price is the most important consideration, especially in this and the prior two segments.

NMC, NCA and NCMA all use nickel and cobalt which are expensive (especially cobalt), but have a lower weight and higher capacity than LFP. The new NCMA (a.k.a., GM's Ultium Battery) is able to reduce the cobalt content by about 70%, and may offer the most bang for the buck (and weight) of any of these three, for now.

However, there may be a fifth member to the "Popular EV Battery Club" in the next couple of years:

High-manganese batteries being eyeballed by Tesla and VW would also use less nickel and zero cobalt: They appear affordable: According to analysts at Roskill Information Services, in London, a lithium nickel manganese oxide chemistry could reduce cathode costs by 47 percent per kilowatt-hour relative to nickel-rich designs. That has VW mulling manganese as a potential fit for mainstream models. LFP for bottom-rung vehicles or markets, and bespoke high-performance packs for the likes of Porsche Audi, Bentley, or Lamborghini.[3]

… That's despite the dispiriting history of the first (and only) EV to use a high-manganese battery, the original Nissan Leaf, beginning in 2011.

… As a cathode material, manganese is abundant, safe, and stable. But it has never approached the energy density or life cycle of nickel-rich batteries, Venkat Srinivisan of Argonne Laboratories cautions. Buyers of early Nissan Leafs might concur: Nissan, with

[3] Lawrence Ulrich, IEEE Spectrum, July 2022 Issue, "Manganese: The Secret behind Truly Mass-Market EVs?" https://spectrum.ieee.org/manganese-ev-batteries

no suppliers willing or able to deliver batteries at scale back in 2011, was forced to build its own lithium manganese oxide batteries with a molecular jungle-gym-like "spinel" design. Those energy-poor packs brought just 24 kilowatt-hours of storage and a 117-kilometer (73-mile) driving range. Even that piddling storage and range rapidly degraded, especially in the southwestern United States and other searing climates, leaving customers howling. (It didn't help that Nissan avoided a thermal-management system for the battery.) A "Lizard" battery in 2014 with a modified manganese chemistry boosted capacity to 40 kWh, but still suffered short life spans.

At Volkswagen's live-streamed "Power Day" in March—a seeming hat-tip to Tesla's "Battery Day" spectacle—CEO Herbert Diess set off his own Muskian frenzy by announcing VW would build a half-dozen gigafactories in Europe by 2030, with a total of 240 gigawatt-hours of capacity. VW is already building EV factories in Tennessee and China. VW, despite its EVs outselling Tesla in Europe, is under intense competitive pressure from Tesla, and in the Chinese market where VW underperforms. The global giant is determined to cut its battery costs by half in entry-level models, and by 30 percent in mid-priced cars.

To get there, VW unveiled a versatile "unified cell" that can use multiple chemistries in a standardized prismatic design. Diess said about 80 percent of VW's new prismatic batteries would spurn pricey nickel and cobalt in favor of cheaper, more-plentiful cathode materials—including potentially manganese.

3.4. Commercial Light to Medium Trucks

Right now this market is pretty tiny but one manufacturer is pushing it forward rapidly, Ford. I covered this in sections 2.3 and 2.4 of the post described and linked below:

Electric Trucks & Buses, Early 2022: *This post covers the latest truck, bus and other news from Ford, GM, Daimler, Tesla, Rivian, The U.S. Government and the Santa Clara Valley Transportation Authority (VTA). The latter is installing a solar-powered microgrid to power its fleet of electric buses.*

https://energycentral.com/c/ec/electric-trucks-buses-early-2022

There are several firms that are receiving EV light trucks and delivery vans and expecting many more: Most notably:

Rivian says it's still on track to produce 25,000 vehicles in 2022. The company reiterated the prediction in a statement it shared on Wednesday. Rivian said it built 4,401 R1T trucks, R1S SUVs and Amazon delivery vans at its factory in Normal, Illinois and delivered 4,467 vehicles during fiscal Q2...[4]

While 4,401 vehicles is a modest tally, it is an improvement for Rivian. In the first three months of the year, the startup built 2,553 cars. Just as noteworthy is that the company managed to scale production while facing many of the same issues that have slowed its competition…

[4] Igor Bonifacic, Engadget via Yahoo Life, "Rivian says it's still on track to produce 25,000 vehicles despite production woes," July 6, 2022, https://www.yahoo.com/lifestyle/rivian-on-track-to-produce-25000-vehicles-in-2022-233943952.html

Increasing production capacity will be critical to Rivian's survival. In addition to an approximately 71,000 vehicle preorder backlog, the company has a 100,000 van order it needs to fulfill for minority owner Amazon…

See image below from Design News:

Also see "EVs - Early Summer, 2022" (linked in the Intro) sections 4 & 5.

3.5. Commercial Heavy Trucks

First some new news on the Tesla Semi. This is still scheduled to start production in 2023, but every once in a while a new prototype pops out of the limited production Semi factory in Reno (see excerpt below). Other major truck manufacturers are making heavy trucks, but all of those are first generation designs. The Tesla Semi is the only second generation design that I believe will make it to mass production (I'm still not convinced that Nikola will survive). This is a very important product for Tesla, everyone that is concerned about climate change, and hopefully will be important for its buyers.

During the Cyber Rodeo event last April, Elon Musk noted that 2023 would finally be the year when Tesla would start producing the Semi. Continuous testing of the all-electric Class 8 vehicles on public roads suggests that this might definitely be the case.[5]

Unlike in previous years when Semi sightings were few and far between and the vehicles were sighted seemingly in random parts of the United States, recent videos of the vehicle seem to be quite focused in areas related to PepsiCo's Modesto facilities. PepsiCo is one of the Tesla Semi's customers, and several Megachargers have already been installed on the company's Modesto site.

A few days ago, a new sighting of the Tesla Semi was posted online. But this time around, it was not just one Semi that was spotted on the road. This time, the sighting

[5] Simon Alvarez, Teslarati, "Twin Tesla Semi updated prototypes sighted testing on freeway," July 11, 2022, https://www.teslarati.com/twin-tesla-semi-sighting-rare-video/

involved twin Tesla Semi units, both of which were sporting the company's updated designs for the all-electric Class 8 truck.

EV enthusiast Timothy Williamson, who shared the video of the two Semis, noted that he sighted the trucks as he was headed west on Highway 80 near Donner Lake. Considering the direction that the vehicles were heading, several commenters on the EV enthusiast's post suggested that the twin Tesla Semis could be heading to PepsiCo's Modesto site.

The Tesla Semi may arguably be one of the company's most delayed products in its lineup today, but it is also one with the most potential for disruption. The trucking market is vast, and it is also responsible for a notable amount of emissions per year. As such, the deployment of the Tesla Semi could contribute to the transportation sector's transition into the sustainability era.

As per Tesla's website today, the Semi will be fitted with four independent rear motors on its rear axles. It is also designed to be extremely energy-efficient, consuming less than 2 kWh per mile. Tesla estimates that Semi customers could achieve savings of up to $200,000 per year. The vehicle is offered in two variants — a 300-mile version that is expected be priced at $150,000 and a 500-mile variant that's expected to be priced at $180,000.

Also, recently the Semi has been seen doing a job for its parent company:

Tesla has always said that it would be its own best customer when it comes to the Tesla Semi, and it is already putting the few electric trucks it has to good use.[6]

We have seen the automaker use its Tesla Semi electric truck to deliver Model 3 vehicles to customers in the past.

Now Tesla shared footage of using the electric truck to deliver pre-assembled Superchargers at the Laguna Seca racetrack in California:

Earlier this year, we reported on Tesla using pre-fabricated Supercharger stations to accelerate the deployment of the fast-charging stations.

In one case, Tesla managed to deploy a new Supercharger in just eight days thanks to delivering the chargers in a pre-fabricated system with both the charging stalls and cabinets on concrete footings.

Also, it's interesting that the automaker is building a station at the Laguna Seca racetrack.

The track is popular with EV owners and especially owners of performance Tesla vehicles in California who can't push their vehicles to their limits on public streets.

Tesla owners have often used the racetrack as a benchmark for the top performance versions of the electric vehicles, like breaking the EV record with the Model S Plaid last year.

---

[6] Fred Lambert, Electrek, "Tesla uses its electric semi truck to deliver Superchargers to Laguna Seca racetrack," June 30, 2022, https://electrek.co/2022/06/30/tesla-semi-electric-truck-deliver-superchargers-laguna-seca-racetrack/

It will be super useful to have a fast-charging station at the track since electric vehicles perform best when they have a high state of charge.

And now for what might have been the first time, the charging station to charge electric vehicles was delivered by an electric vehicle: the Tesla Semi electric truck.

See image below:

The following earlier posts are on the first generation heavy electric trucks that are being produced. Note that section 3.2 in the post described and linked immediately below contains listings of heavy EV trucks that qualify for a State of California incentive. The listings also contain vocational trucks, medium trucks and hydrogen fuel cell trucks. Section 3.3 of this post has a subsection on each manufacturer.

Electric Trucks and Buses in California: *This paper is much longer that I like to post, but I thought it better to leave it together rather than splitting it. It is not just for my normal reader, but also for stakeholders of private and public organization that are involved in the title subject. Mostly in California, but also outside of our state.*

This post will take a deep dive into California requirements and incentives for medium and heavy electric trucks, buses and related technologies, and look at why California is doing this. This paper will also dive into truck and bus manufacturers and their products. And finally, we will review U.S. federal incentives for electric trucks and buses.

https://energycentral.com/c/ec/electric-trucks-and-buses-california

Section 2 of the post described and linked below contains a detailed description of medium and heavy trucks and their manufacturers, except the last subsection contains information on a major logistic / fulfillment / warehousing hub.

Electric Truck & Bus Update, Part 1: Trucks: *The subjects of this post are starting to emerge, and it should be interesting to see these markets develop. A major consideration, especially for electric utility professionals, is that the vehicle types covered in this post take a huge amount of energy to recharge them. Also many of these*

vehicles will perform recharging en masse. This will be at logistic/distribution centers for trucks. These facilities are currently not prepared for the massive load increase as their vehicles transition to electric operation. Since logistic centers tend cluster around major highways and urban perimeters, the electric transmission and distribution networks in these areas will also need upgrading.

This post is on the progress to date of the medium-to-heavy truck and markets. We will also look at one area that has become a major logistic / distribution / fulfillment hub – San Joaquin County California.

https://energycentral.com/c/ec/2021-electric-truck-bus-update-part-1-trucks

3.6. Personal Luxury Electric Vehicles

This is the most profitable segment of the EV "car" market on a per vehicle basis, and includes both traditional sedans and SUVs (like the Tesla Model S, Volvo C40 Recharge, Audi e-tron, Porsche Taycan and BMW iX). I would consider the price point for this segment to be in the range of $70K to $120K (base price, without federal or state rebates / credits and before tax, license or EVSE). Note that your author considers any "car" with a base price significantly over $100K to be silly, and not something a normal person would buy.

The volumes are much lower in this segment verses Personal Mid-Sized EVs. I believe Tesla's Q2, 2022 Sales for these respective segments is indicative: *16,162 units of the Model S and Model X flagship vehicles were delivered, while the Model 3 and Model Y accounted for 238,533 deliveries.*[7]

Even through the above are global results, I believe a roughly 10:1 ratio of Mid-Size to Luxury vehicles-delivered will hold in the U.S. for at least the next few years.

3.7. Commercial Medium & Heavy Buses

First of all note that the above Commercial Light to Medium Truck segment includes medium buses, since these are generally based on Step and Panel Van chassis. Also, both the Medium Truck and this segment include School Buses, even though this market has a separate channel.

See "Electric Trucks and Buses in California" linked in section 3.5. This post provides a good description of Heavy Buses, their incentives in California, federal incentives, and the bus manufacturers.

4. Other Related Subjects

The following subsections contain some information that is related to the above markets.

4.1. BYD

The title company is a very unique one. First of all it is a major player in the Global EV market. From "Electric Trucks and Buses in California" referenced and described in section 3.5:

[7] Joey Klender, Teslarati, "Tesla Q2 2022 results: Record production month in face of supply chain and Shanghai shutdown," July 2, 2022, https://www.teslarati.com/tesla-q2-2022-production-and-deliveries-results/

BYD manufactures electric buses in the U.S. China and Europe, and is (mostly) a U.S. company although its roots (and largest market) are in China. Last year BYD indicated that it had sold 1,000 buses in the U.S. BYD builds battery-electric buses and coaches at BYD's 550,000 square foot manufacturing facility in Lancaster, California.[8]

BYD, the China vehicle and battery maker backed by Warren Buffett's Berkshire Hathaway, said on Sunday sales of new energy vehicles more than tripled in June to 134,036 from 41,036 a year earlier, underscoring the popularity of EVs in the world's largest auto market. [9]

The company's sales in the first six months of the year soared by 315% year-on-year to 641,350 EVs, shaking off industry disruption from Covid-related lockdowns in Shanghai. BYD's sales in June also topped May's 114,943…

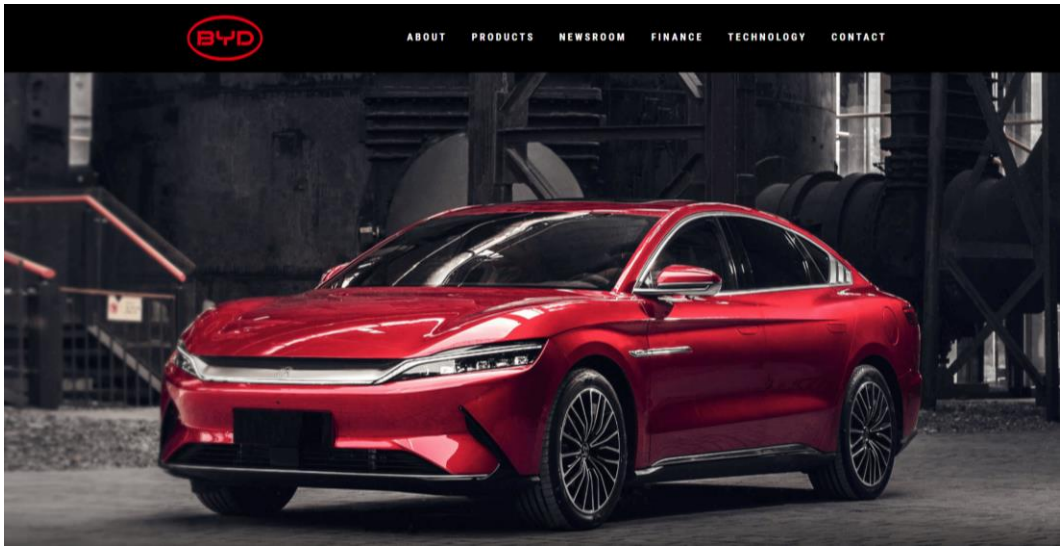
BYD's overall business is more diversified than its rivals – it also makes handset components and photovoltaics. Among its customers are Dell, Apple, Xiaomi and Huawei.

Note that BYD probably has better control of its supply chain for electronics than other road vehicle manufacturers.

Section 3.1 above indicates: "*It is hoped that more advanced designs can keep the price below $30K without this credit. Perhaps these designs might come from other manufacturers."*

BYD just might be one of those manufacturers. To date they haven't sold EV "cars" in the U.S. However, the just went live with the site linked below, with the home page image below that. Note that they BYD sites below have occasionally been unavailable.

https://en.byd.com/auto/



BYD North America also sells a variety of different medium and heavy trucks, but I believe that these are imported from China.

[8] BYD Buses, https://en.byd.com/bus/

[9] Russell Flannery, Forbes, "Warren Buffett-Backed BYD's EV Sales More Than Tripled In June," July 3, 2022, https://www.forbes.com/sites/russellflannery/2022/07/03/warren-buffett-backed-byds-ev-sales-more-than-tripled-in-june/

4.2. VinFast

VinFast, an electric carmaker backed by Vietnam's richest man, opened six showrooms in California on Thursday as the newcomer tries to muscle into a US market dominated by Tesla Inc.[10]

The showrooms are VinFast's first outside of Vietnam. It plans to eventually open more than 30 in the state and elsewhere to sell directly to American consumers. US deliveries are due to start in the fourth quarter, Chief Customer Officer Craig Westbrook said in an interview at a new showroom in Santa Monica, just around the corner from a Tesla store in the same mall a few blocks from the beach.

Two VinFast electric vehicle models will initially be available for reservation at US stores: the VF 8, a mid-size SUV that starts at $40,700, and the VF 9 SUV, priced from $55,500. The cars were on display Thursday in the atrium of the Santa Monica mall and the showroom there, which is less than half of the size of Tesla's. The event attracted a crowd of shoppers, and Korean-American K-pop star AleXa performed on stage…

VinFast, a unit of conglomerate Vingroup JSC, was founded by billionaire Pham Nhat Vuong in 2017 and started making gas-powered cars in 2019. The company, which says it has about 73,000 reservations for its EVs globally, has a factory in Hai Phong in northern Vietnam and is the country's only homegrown carmaker…

Author's comment: After the Vietnam War many Vietnamese migrated to California. They established large communities in my state, and have been key in the U.S. building strong business-relationships with Vietnamese firms in recent years.

VinFast,.. announced it received a $1.2 billion incentive package from the state of North Carolina to support its plans to build a manufacturing plant at Triangle Innovation Point in Chatham County.[11]

VinFast currently builds the VF8, a mid-size electric SUV, and the VF9, a full-size electric SUV.

The incentive package includes a job development investment grant of $316 million over 32 years, state appropriation of $450 million, to cover site preparations, road improvements, and additional water and sewer infrastructure, community college training worth $38 million, a Golden Leaf Foundation grant of $50 million, and $400 million in incentives from Chatham County. Additionally, VinFast said it has received hundreds of millions of incentives from commercial organizations in the State of North Carolina, which is excluded from the government budget figure.

The funds join an investment of about $2 billion in the first phase of VinFast's US manufacturing plans. The plant is designed to produce 150,000 electric vehicles each year.

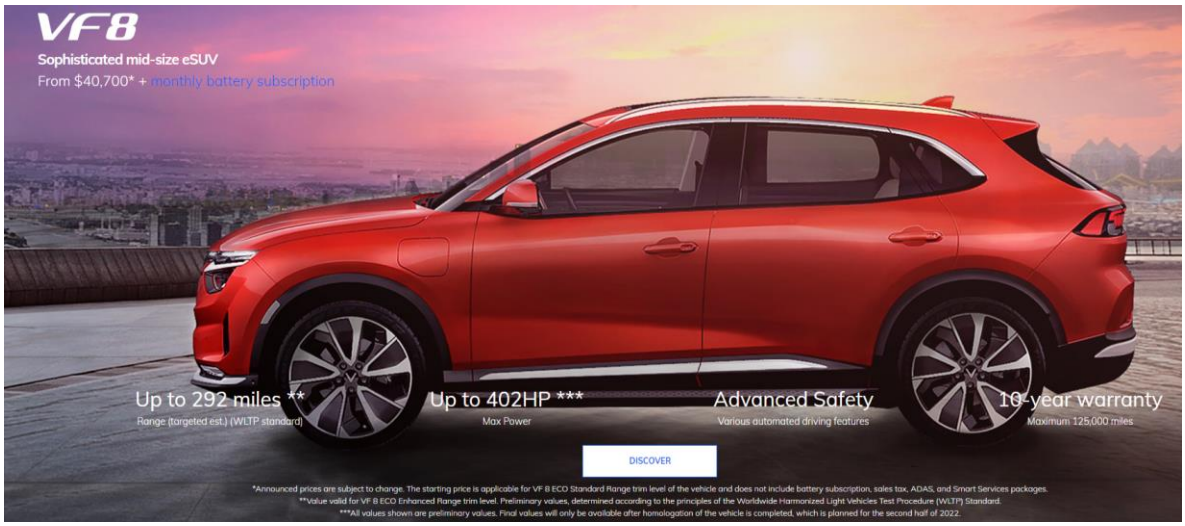
---

[10] K. Oanh Ha and Nguyen Kieu Giang, Bloomberg News, "VinFast Opens First EV Showrooms on Tesla's California Doorstep," 2022, https://www.bnnbloomberg.ca/vinfast-opens-first-ev-showrooms-on-tesla-s-california-doorstep-1.1792340#

[11] Ryan Kennedy, PV Magazine, "VinFast receives $1.2 billion incentive package to manufacture EVs in North Carolina," July 14, 2022, https://pv-magazine-usa.com/2022/07/14/vinfast-receives-1-2-billion-incentive-package-to-manufacture-evs-in-north-carolina/

The facility will cover 2,000 acres, and will be divided into two major production lines, one for electric car and bus production, and the other for ancillary industries for suppliers. The facility is expected to bring thousands of jobs to North Carolina once it is completed.

See the image below. Their web-sites are linked below that.



https://shop.vinfastauto.us/en/en_US/VF-8.html

https://vinfastauto.us/