# Electric Trucks & Buses, Early 2022

*By John Benson*

*February 2022*

## 1. Introduction

My last post on EVs is described and linked below.

***Tesla, Early-2022:*** *Although the next few months should be interesting for the title manufacturer, in the first month of the New Year there will probably be little to report, so this should be a short post.*

https://energycentral.com/c/ec/tesla-early-2022

The last text in the above post was my comment on Tesla's changing priorities:

*As Tesla has grown into a giant, there have been many challenges that almost killed it. I don't believe Elon has the appetite for another. Whether this is a return to sanity or simply an older, more mature approach for the (still) most aggressive, fastest growing EV- (etc.) maker remains to be seen.*

By delaying rollout of the Cybertruck and Semi until 2023, Tesla has opened the door for, respectively, Ford and Daimler. This news is below. Note that these developments emerged within two weeks after the announcement by Elon of the change in priorities.

## 2. Ford

*Ford is planning for a major restructuring of its electric vehicle offensive with a massive budget of up to $20 billion. Bloomberg reports that Ford will utilize specific strategies that Tesla used to gain its notoriety as the EV leader, including a road map for vehicle launches and manufacturing planning and a sizeable budget.*[1]

*Ford has made drastic changes to its EV leadership, including the acquisition of Doug Field, a former Tesla engineer who left the company for Apple and then left Apple for Ford in 2021. Overall, the total electrification reorganization plan has a budget of between $10 and $20 billion, giving Ford free range in terms of what its capabilities will be moving forward.*

*One of the most crucial portions of Ford's new plan is to transition factories that are responsible for manufacturing gas-powered vehicles into EV plants. A sizeable portion of the investment will be set aside for this task and could take up to ten years to complete, sources familiar with the matter told the publication…*

*Recently, Ford committed to a lofty goal of 600,000 deliveries within 22 months. CEO Jim Farley believes Ford can be "one of the first to scale" in terms of legacy car companies. Ford has largely been the most committed legacy company to adopt EVs, launching several highly competitive vehicles in its first few years. F-150 Lightning deliveries are expected to begin in the spring, and the Mustang Mach-E was the second-best-selling crossover SUV EV in 2021, trailing only the Tesla Model Y.*

[1] Joey Klender, Teslarati, "Ford plans for major restructuring of its EV playbook with $20B budget: Bloomberg" Feb 1, 2022, https://www.teslarati.com/ford-ev-playbook-20-billion-restructuring/

*Spearheaded by Farley, who recently commented that Ford would not abandon its Rivian investment, the playbook is relatively similar to the one EV leader Tesla used to launch its company from an unlikely success story to the most valuable automaker globally.*

## 2.1. Rivian & Ford

**Author's Comment:** Regarding the above comment on Ford and Rivian, The latter Truck and SUV manufacturer is doing just fine without the originally-planned jointly developed truck (cancelled in November). After extensive testing, Motor Trend named the Rivian R1T its 2022 Truck of the year. In the run-up to the TOTY testing, MT took the R1T across the U.S., but avoided paved highways as much as possible (to test the R1T off-road chops). The R1T performed exceptionally.

The follow-up vehicle to the R1T is the R1S SUV. First deliveries to real customers are rumored to be in summer to fall of this year. To date Rivian has delivered about 1,000 vehicles (I assume a large majority are R1T trucks, but they have announced some R1S deliveries to Rivian senior management). Their vehicles are rather pricy and complex (base prices of either is around $70K). I hope they have a good strategy to deal with supply chain issues. Reportedly they have 70,000 vehicle reservations.

## 2.2. Potential Barriers

In a recent post I indicated that Ford was clearly suffering from supply chain issues.[2]

*Ford Motor Co. late Thursday swung to a quarterly profit, but fell short of what Wall Street had hoped, with sales also well below expectations as "persistent supply-chain disruptions" hampered its ability to meet strong demand…*[3]

*Nowadays, few customers ask Ford why it phased out sedans, a controversial decision in 2018, and many more are asking to take delivery of Ford's new SUVs and pickup trucks, he said. Ford plans on taking "full advantage" of a first-mover position in the fully electric pickup market, starting with its F-150 Lightning, he said…*

*Ford has more than 275,000 orders or reservations for its all-electric Mustang Mach-E SUVs, F-150 Lightning pickups and E-Transit commercial vehicles, Farley said. Ford is "breaking constraints to deliver every one of them as fast as we can."*

Currently Tesla is the 900 lb. gorilla in the auto market, and how do you take on a 900 lb. gorilla? You don't – you go where they are not. See the subsection below.

## 2.3. Ford E-Transit

Of the two trucks mentioned in the above "*Ford has…*" paragraph, I find the E-Transit light- to medium-duty Van the most compelling. This is a true commercial vehicle. The Lightning is really more of a consumer vehicle and is much more complex than the E-Transit (although there are simpler fleet versions of the Lightning).

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[2] Energy Central Post, "Power Industry 2022 Trends & Predictions, subsection 2.1" Jan 13, 2022, https://energycentral.com/c/ec/power-industry-2022-trends-predictions

[3] Claudia Assis, MSN Market Watch, "Ford sales stumble on 'persistent' supply problems," Feb 4, 2022, https://www.msn.com/en-us/money/companies/ford-sales-stumble-on-persistent-supply-problems/ar-AATrPOQ?ocid=BingNews

*SONOMA, Calif. – If a delivery driver can master a push-button starter and rotary shifter, they can master the sophisticated yet simple Ford E-Transit electric commercial van, which goes on sale this month.*[4]

*There's no learning curve with the E-Transit, and that's exactly how Ford wants it. The gasoline-powered version of the Transit is America's No. 1 selling medium-duty business van. Tens of thousands of people work in them every day at businesses ranging from owner-operator food trucks to utilities and massive delivery services. I recently drove a pair of E-Transits in the California wine country, where three grape growers will test the vehicles and Ford's far-reaching system to manage charging, maintenance and more.*

*The E-Transit sneers at look-at-me features like disappearing door handles and steering yokes.*

*Why? It's a tool, not a toy. Time spent figuring out fancy new features and controls is time not working or getting to work, and that's lost income.*

*There's plenty new in the E-Transit, but Ford makes it almost unconsciously simple, with the exception of a chiding electronic voice that delivers messages like, "Unless in an emergency, try to avoid sudden braking. Looking ahead and braking early can help."*

*There's no button inviting you to experiment with different levels of regenerative braking, as you'll find in many personal use EVs.*

*Instead, regeneration — the term for recharging the battery slightly while slowing down — happens when you press on the brake. Press harder and you get a second, higher level of regeneration. If you want the most regen, a setting that slows the vehicle dramatically when you're off the accelerator pedal, press the "L" button in the gear selector. There isn't a low gear, but max regen mimics one by slowing the vehicle noticeably, though not to a complete stop.*

*If you do pay attention, though, you'll notice plenty of differences. More power when you accelerate. Enough to trigger another scolding from the energy-conscious electronic nanny. Smooth, easy acceleration uses less energy, helping the E-Transit achieve its rated range of 126 miles on a fully charged battery.*

As I'm writing this (Early February) Ford has started deliveries:

*Ford Motor Company announced today that it has successfully started shipping its brand new all-electric E-Transit van to customers, working to fulfill the over 10,000 orders the automaker has to for the vehicle.*[5]

*"Ford E-Transit™, the electric version of America's best-selling commercial van and the first of two all-electric vehicles purpose-built for Ford Pro™ commercial customers, is now shipping across the U.S.," Ford wrote in a press release today.*

The E-Transit comes in four body-styles: three increasingly large vans (see picture below) and a chassis & cab for a box truck.

[4] Mark Phelan, Detroit Free Press via Yahoo News, "Ford E-Transit electric delivery van is easy to use despite high tech," Jan 31, 2022, https://news.yahoo.com/ford-e-transit-electric-delivery-110245883.html
[5] Joey Klender, Teslarati, "Ford begins shipping all-electric E-Transit, beginning fulfillment of over 10,000 units," Feb 8, 2022, https://www.teslarati.com/ford-e-transit-deliveries-orders/

The E-Transit is being built in Ford's Kansas City Truck Plant.

*According to the automaker, it has already received around 10,000 orders from 300 different customers, including commercial customers, private buyers and government institutions. Among these buyers are the world's largest retailer Walmart, which placed the largest order of 1,100 E-Transit vans.*[6]

The starting price is in the $40K to $50K range.

The range (126 miles) may not seem adequate, but the "delivery van" use-case typically travels under 100 low-speed miles per day with many stops and starts. This optimal use for an EV.

Go through the link below for additional information on the E-Transit.

https://www.fleet.ford.com/showroom/commercial-trucks/e-transit/2022/

## 2.4. Ford Pro

Ford Pro is a program that is specifically for fleet operators:

*Imagine combining the world-class cars, trucks, vans and SUVs you need to build your fleet with the service options, financing flexibility and telematics data you need to manage it. With Ford Pro, you can do just that and:*[7]

- *Shop for and finance a fleet that suits your specific business needs*
- *Improve fleet uptime through new service and maintenance options*
- *Manage all-electric vehicle charging with E-Telematics*
- *Monitor fleets with vehicle health data from Ford Pro™ Intelligence*
- *Track vehicles and driver behaviors with Ford Pro™ Telematics*

Specific for EVs Ford Pro offers charging infrastructure:

[6] Manish Kharinta, FutureCar, "Ford's All-New E-Transit Electric Van Enters Production," Feb 2, 2022, https://www.futurecar.com/5169/Fords-All-New-E-Transit-Electric-Van-Enters-Production

[7] Ford Pro Home Page, https://pro.ford.com/en-us/

*Put a charge into your productivity and maybe even turn a few heads with the new all-electric versions of our best-selling commercial vehicles — E-Transit and F-150 Lightning™ Pro.*

*We've made charging your all-electric commercial fleet vehicles easy through three convenient charging methods, each engineered to help you efficiently operate your all-electric fleet vehicles:*

### 2.4.1. Depot Charging

*From planning to charge management and everything in between, we'll work with you to get charging up and running at your facility.*[8]

### 2.4.2. Home Charging

*Our variety of home charging options allow your drivers to continue to take their work vehicles home every day to help optimize uptime. Ford Pro E-Telematics can be used to provide charging reports and to reimburse drivers for business energy expenses.*

### 2.4.3. Public Charging

*With the ability to access over 70,000 plugs on the BlueOval™ Charge Network—the largest public charging network from coast to coast—along with mobile tools to help you find where to charge on longer routes3, your fleet can stay powered on the road.*

Note that the Ford Pro page linked in reference 8 below contains a map-based charger-finder. I tested it briefly and it quickly found roughly 25 chargers in Livermore, CA (where I live), including one 3-charger public facility that was recently installed near my home.

# 3. GM

The reason that I like the Ford E-Transit is that it is very simple, thus less susceptible to chip shortages. To that you can add it is being built in Kansas City, far from Detroit and angry truckers blocking bridges. Now read Ms. Barra's latest pronouncements.

*It appears that General Motors is looking to increase its electric truck and SUV production this 2022. But while the veteran's plans call for a sixfold increase from the company's previous production targets, GM's overall electric truck and SUV output for 2022 would likely remain conservative.*[9]

*This was, at least, according to new details cited by Reuters from the company's suppliers. According to the publication, details shared with GM suppliers indicate that the company is looking to raise its production of electric trucks and SUVs this year to 46,000 vehicles. This target was reportedly set at 7,000 vehicles this year previously.*

*As per the publication's sources, GM has reportedly told its suppliers for the GMC Hummer EV that the company is planning to produce 21,000 units of the hulking all-electric vehicle this year at its Factory Zero site in Detroit. The Hummer EV's previous 2022 goal was reportedly set at only 3,800 units, which was very conservative.*

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[8] Ford Pro, "One-Stop-Shop Charging Solutions," https://pro.ford.com/en-us/charging/

[9] Simon Alvarez, TESLARATI, "GM's electric truck and SUV production target increases sixfold to 46k in 2022: report," Feb 10, 2022, https://www.teslarati.com/gm-ev-production-target-for-2022-is-a-joke/

*GM has reportedly also informed suppliers for the Cadillac Lyriq that the company is increasing its production of the all-electric SUV to 25,000 units this year. The veteran carmaker was reportedly planning to produce only 3,200 units of the Lyriq this year previously.*

*A 46,000-unit target for the company's electric trucks and SUVs hints that GM is adopting a rather conservative ramp of its new generation of EVs. This is quite interesting considering that GM CEO Mary Barra told investors last week that the company intends to accelerate its production of electric vehicles. Barra noted that GM will be looking to deliver 400,000 EVs in North America during 2022 and 2023.*

There is some positive news regarding GM. According to my latest Motor Trend. Cadillacs are extremely popular in China, and many believe that the above electrification announcements are more for the Chinese Market than the U.S. China accounts for as much as 40% of GM's sales, but like all other foreign auto manufacturers except one, GM was forced to partner with a Chinese auto manufacturer. Thus GM manufacturers it's Chinese Vehicles in the Cadillac China manufacturing facility (otherwise known as Cadillac Jinqiao or Shanghai-GM Jinqiao). GM's JV partner is SAIC Motor Corp. By the way, Tesla is the one foreign auto manufacture that has been exempted from a JV requirement. Also note that the U.S. has approximately 1 million EVs. China has approximately 3 million EVs, and many of these are trucks and buses.

The Hummer EV is made in GM's Detroit-Hamtramck Factory. The somewhat better news is that the Lyriq will be made in GM's Spring Hill Assembly plant in Tennessee. However, both of these vehicles are about as complicated as EVs can be and will need lots of chips.

# 4. War of Words and then – Pleas for Help

President Biden has been publically saying GM and Ford are leaders in the EV Industry (ha-ha!) and ignoring Tesla. This has evolved into a war of words, but it's reasonably understandable. Some of the President's strongest supporters are unions, and Elon hates unions. Although GM and Ford don't exactly love them, the do tolerate them and have common cause with them.

Now the administration needs Elon's help with a little problem GM and Ford are having – getting automotive chips:

*Biden still hasn't recognized Tesla for its leadership in the EV space, yet Commerce Secretary Gina Raimondo is seeking help from the company in relation to supply constraints affecting the semiconductor industry.*[10]

*"America still leads the world in design and software, and the tooling, the equipment to make the chips," Raimondo said Thursday on CNBC's "Squawk Box." She wants semiconductor manufacturing to expand in the U.S. so the country can be less dependent on overseas manufacturers.*

*When asked specifically about whether Musk should be by his phone expecting a call, Raimondo said "yeah, absolutely."*

[10] Adam Eckert, MSN Benzinga, "Biden Won't Acknowledge Tesla, And Now The White House Wants Elon Musk's Help With The Chip Shortage," Feb 4, 2022, https://www.msn.com/en-us/money/news/biden-won-t-acknowledge-tesla-and-now-the-white-house-wants-elon-musk-s-help-with-the-chip-shortage/ar-AATtZDs

*"Look, none of this is personal," she said. "These issues are way too important for anyone to have, you know, feelings hurt. Like, let's just do the work. And as I said, anyone who has good ideas or is willing to help us, absolutely we want the help."*

*Raimondo noted that Tesla was able to navigate the chip shortage better than its competitors because of the nature of its business as a tech company, opposed to an automaker.*

*It remains to be seen if Biden will be the one reaching out to Tesla, and furthermore, if he will acknowledge the company as the EV leader it has been and continues to be.*

I think the reason Tesla has fewer chip problems than other auto manufacturers can be understood by repeating a few subsections from a past post.

## 4.1. Data Processing Subsystems – Overview

*The original Model S was designed from the beginning to be fully connected to the cloud. This means several things for all of the systems below.* [11]

- *Although Teslas have powerful internal processors (see below), they can also use the processing power and more importantly the data storage of the cloud.*
- *Each vehicle learns and adapts to its user(s), and the Tesla cloud learns about all f their users (individually and collectively), all routes, all environments, all of its EVs and continues to adapt those EVs to their environment over time.*
- *All auxiliary systems that support the Tesla EV (chargers, maintenance facilities, etc.) also communicate with the cloud and thus know about all EVs and their users*
- *Any anomaly in a single EV or a single model / version of any Tesla EV is detected by the cloud. Eventually anomalies are repaired by a nightly software update whenever possible.*

*The latter reminds me of the way Microsoft Windows works with its periodic updates, although Windows (including Microsoft Applications designed to run under Windows) is 100% software-based, a Tesla EV is not. If Tesla ever invents a way to fix a punctured tire with a software update, I'll be really impressed; not so much if they invent proprietary tire designs.*

### 4.1.1. Data Processing Subsystems – FSD and Hardware

*Full Self Driving is uniquely dependent on in-vehicle processing power. That's because going through a data network to get to cloud resources is slow, compared with the speed that decisions need to be made when driving a car. Tesla has struggled with this since the Model S. If Elon has a fault it's that he occasionally discounts the amount of time and effort required to implement a project, and sometimes by a large amount. But he's stubborn, determined and never gives up. That is why he will eventually will solve FSD.*

*However along the way to this Nirvana, Elon has created much good:*

[11] Energy Central Post, "Bottom-up, Tesla's Component Edge," Oct 2021, https://energycentral.com/c/ec/bottom-tesla%E2%80%99s-component-edge

*In the 4st quarter (2021), we registered one accident for every 4.31 million miles driven in which drivers were using Autopilot technology (Autosteer and active safety features). For drivers who were not using Autopilot technology (no Autosteer and active safety features), we recorded one crash for every 1.59 million miles driven. By comparison, NHTSA's most recent data shows that in the United States there is an automobile crash every 484,000 miles.*[12]

*The latest milestone on the way to FSD is a new data processing architecture for all new vehicles:*

*At Tesla AI Day last month, CEO Elon Musk was asked whether or not Tesla is reaching the limit of the FSD computer's capacity.*[13]

*The CEO reiterated that he still believes the FSD computer will be able to achieve full self-driving…*

*But Tesla also always said that it plans to improve on the FSD Computer first introduced in 2019.*

*At the event, Musk referenced the "Hardware 4" or "FSD Computer 2" and linked it to the launch of the Cybertruck…*

*Now sources talking to the Korea Economic Daily said that Tesla is in the late stages of negotiating the production of the new chip with Samsung…*

*Samsung reportedly plans to produce the chip using its 7-nanometer technology at its Hwasung factory:*

*The plant would reportedly be able to handle large-volume production of the chip to satisfy Tesla's demand.*

*If the chip is to debut in the Cybertruck as indicated by Musk, it would put the release in late 2022.*

**Author comment:** Make "…*late 2022."* …early 2023."

***Issues with the automotive chip supply pipeline:*** *I don't know if this is generally true, but apparently these issues will be resolved for Tesla:*

*Tesla Inc. CEO Elon Musk said on Friday that thanks to new semiconductor plants that are planned or under construction, the global chip shortage that has pummeled the car industry this year should be short term in nature.*[14]

*Asked how long he thought the global chip shortage would affect vehicle production, Musk said: "short term I think".*

*"There's a lot of chip fabrication plants that are being built," Musk said during a joint session with Stellantis and Ferrari Chairman John Elkann, at Italian Tech Week.*

*"I think we will have good capacity for providing chips by next year (2022)," he added.*

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[12] https://www.tesla.com/VehicleSafetyReport

[13] Fred Lambert, Electrek, "Tesla is in talks with Samsung to produce its next-gen Full Self-Driving chip," Sep 23, 2021, https://electrek.co/2021/09/23/tesla-in-talks-samsung-produce-next-gen-full-self-driving-chip/

[14] Giulio Piovaccari, Reuters via MSN, "UPDATE 1-New semiconductor plants will end global auto chip shortage next year -Tesla's Musk,", Sep 24, 2021, https://www.msn.com/en-us/money/companies/update-1-new-semiconductor-plants-will-end-global-auto-chip-shortage-next-year-teslas-musk/ar-AAOMczh?ocid=BingNews

### 4.1.2. Data Processing System – Communication

*There have been ways of linking vehicles to the cloud for several decades – cellular Internet Protocol (IP) networks. Initially these were very slow and had limited coverage. But as digital cellular matured through Gen-2, Gen-3 and now Gen-4 technologies, this transport became very fast, and coverage is now almost ubiquitous.*

## 4.2. Long-Term Solution to Chip Problems?

*Washington – The House voted Friday to pass the America COMPETES Act, a bill that aims to increase U.S. competitiveness with China and to address the country's shortage of semiconductors by strengthening the country's supply chain.*[15]

*…The bill's Senate counterpart, the US Innovation and Competition Act of 2021, passed with the support of 19 Republican Senators in June. Now that the House version of the legislation passed, the differences between the two bills will be reconciled by conference committee.*

*The bill includes $52 billion to support domestic manufacturing and research of semiconductors, the chips that are used in electronic devices and have faced shortages throughout the pandemic, contributing to delays and increased costs.*

*The incentives for semiconductor production come as the U.S. has increasingly relied on imports for computer chips. Twelve percent of the world's chips are made in the U.S., down from 37% in the 1990s, according to industry officials. About 80% are made in Asia.*

**Author's Comment:** A large percentage of the chips used in the U.S. are actually designed in the U.S., but in the last three decades the chip foundries (where the chips are actually made) have migrated to Asia. Although throwing a large amount of money at the problem may eventually mitigate it, each chip foundry requires billions of dollars and years to build. The good news is that both Intel and Taiwan Semiconductor Manufacturing Co. have already started constructing new foundries in the U.S.[16]

# 5. Tesla Major Problem

Since the prior section involved Tesla (ditto the next section), I decided to put some late-breaking news about Tesla here. I recently commented that the Tesla Fremont Plant (a.k.a. The Mothership) is the most productive auto plant in the country. In spite of this, Elon needs to do some house-cleaning there.

*Just a few days ago, Tesla noted in a blog post that the California Department of Fair Employment and Housing (DFEH) is intending to file a lawsuit against the company over alleged systemic racial discrimination and harassment in the its CA facilities. The*

[15] Dylan Wells and Joey Garrison, USA Today via MSN, "House passes COMPETES Act bill aimed at boosting US competitiveness with China," Feb 7, 2022, https://www.msn.com/en-us/news/politics/house-passes-competes-act-bill-aimed-at-boosting-us-competitiveness-with-china/ar-AATtIUf?ocid=BingNews

[16] See the links below:
https://www.cnbc.com/2020/05/15/tsmc-to-build-us-chip-factory.html
https://www.cnbc.com/2021/03/23/intel-is-spending-20-billion-to-build-two-new-chip-plants-in-arizona.html
https://www.intel.com/content/www/us/en/newsroom/news/intel-announces-next-us-site-landmark-investment-ohio.html

*DFEH's lawsuit has now been filed, and just as Tesla's blog post suggested, its accusations are indeed very, very serious.*[17]

*The lawsuit, which was electronically filed to the Superior Court of California, County of Alameda on February 9, 2022, pointed out that Tesla is currently the "largest and highest-profile" electric car company in the world. The suit also highlighted that "Tesla's Fremont factory is the only nonunion major American automotive plant in the country." And while a job at Tesla is typically seen as a "golden ticket" for those without a technical background or college degree to secure a job in tech and a path to a career and a living wage, there is segregation and a systemic racism issue prevalent in the company's CA facilities.*

*The Department of Fair Employment and Housing alleges that this segregation, as well as the absence of Black and/or African Americans in leadership roles, has resulted in rampant racism being left unchecked for years.*

> *"As early as 2012, Black and/or African American Tesla workers have complained that Tesla production leads, supervisors, and managers constantly use the n-word and other racial slurs to refer to Black workers. They have complained that swastikas, "KKK," the n-word, and other racist writing are etched onto walls of restrooms, restroom stalls, lunch tables, and even factory machinery. They have complained that Black and/or African American workers are assigned to more physically demanding posts and the lowest-level contract roles, paid less, and more often terminated from employment than other workers.*
>
> *"They have also complained that Black and/or African American workers are often denied advancement opportunities, and more often and more severely disciplined than non-Black workers. More significantly, these numerous complaints by Black and/or African American workers about racial harassment, racial discrimination, and retaliation lodged over a span of almost a decade have been futile. For example, defendants turned, and continue to turn, a blind eye to years of complaints from Black workers who protest the commonplace use of racial slurs on the assembly line. Tesla was, and continues to be, slow to clean up racist graffiti with swastikas and other hate symbols scrawled in common areas..."*

California State and most Local Governments take issues involving equity and fairness very seriously, especially issues involving any minority groups. The above described issues could result in a major hit to Tesla's reputation and pocketbook. It should also be pointed out that the primary demographic that buys Tesla EVs are (1) mainly in California, and (2) pretty liberal and thus will look negatively on the above-described behavior.

# 6. Daimler and the Tesla Semi

It is generally recognized that EVSE (a.k.a. EV charger) designed for light-duty EVs will not work for Class-8 Semis. Although during development Tesla used "adapters" to charge their Semi in standard Supercharger Stations, using multiple Superchargers to connect to the Semi's Megacharger, now Tesla has started deploying real Megachargers at its small Semi pilot plant near its Gigafactory 1. They also deployed three

[17] Simon Alvarez, TESLARATI, "The DFEH's case against Tesla has been filed, and its allegations are very, very serious," Feb 11, 2022, https://www.teslarati.com/tesla-vs-dfeh-racism-case-details/

Megachargers at PepsiCo's Frito-Lay facility in Modesto, California. It is rumored that the latter facility will start receiving Semi early production units from the pilot plant shortly.

I'm sure that Daimler understands that it will need to deploy a charger network for its early medium and heavy prototype trucks, and thus the article below.

*Daimler Truck North America, associated with the Mercedes-Benz brand, NextEra Energy Resources, and BlackRock Renewable Power announced the signing of a memorandum of understanding to develop a joint venture in the design, development, installation, and operation of a nationwide charging network for medium- and heavy-duty battery electric vehicles and hydrogen fuel cell vehicles.*[18]

*Operations of the joint venture are expected to begin this year. Initial investment in the venture included an evenly split $650 million from the three parties.*

*…The parties shared plans to deploy a network of charging station routes along the east and west coasts and in Texas by 2026. The plans call for leveraging existing infrastructure and amenities while adding greenfield sites in anticipation of a rising customer base. The first phase of construction is planned for 2023, said Daimler.*

*The project will initially focus on medium- and heavy-duty battery EV, followed by hydrogen fueling stations. The sites are also planned to be accessible to light-duty passenger vehicles.*

*NextEra Energy Resources, a global solar and wind generator, has significant investments in EV charging infrastructure, and will bring experience in optimizing renewable energy, resiliency and grid integration. The group of three said it seeks to invest over $9.5 billion in total commitments across 350 solar and wind projects, as well as battery energy storage and charging infrastructure.*

*Daimler plans to begin the production of the battery electric freightliner eCascadia and eM2 in 2022-23, and additionally builds walk-in vans, school buses, and other fleet vehicles. The automaker partnered with Portland General Electric to build the nation's first public charging site for commercial electric vehicles.*

Since one of the partners, NextEra Energy Resources, is a major developer of renewable energy projects, it is assumed that very-low greenhouse gas power will be available, at least as an option. Note that most NextEra PV Projects include storage.

For more information on Daimler's trucks go to section 2.6 of earlier post linked in the reference here.[19]

# 7. California Buses

*The California Air Resources Board's requirement for public transit agencies to transition to 100% zero-emission fleets by 2040 is moving the Santa Clara Valley Transportation*

[18] Ryan Kennedy, PV Magazine, "Daimler, NextEra, and BlackRock to deploy nationwide US electric trucking network," Jan 31, 2022, https://pv-magazine-usa.com/2022/01/31/daimler-nextera-and-blackrock-to-deploy-nationwide-us-electric-trucking-network/

[19] Energy Central Post, "2021 Electric Truck & Bus Update, Part 1: Trucks," Aug 2021, https://energycentral.com/c/ec/2021-electric-truck-bus-update-part-1-trucks

*Authority (VTA) to install a solar-powered microgrid to power its fleet. The VTA received a grant for the project from the California Energy Commission.*[20]

*In conjunction with Proterra and Scale Microgrid Solutions, VTA will deploy approximately 1.5MW of rooftop solar on a solar canopy at the Cerone bus yard. VTA's current electric bus fleet consists of 40 Proterra buses, with five more on the way. Upon completion, the new charging infrastructure will be able to fully charge a bus in as little as four hours.*

*Proterra is a developer and producer of commercial electric vehicle technology, and, in addition to providing the electric buses, the company is installing the charging system. Scale Microgrid Solutions is the integrator of the EV infrastructure with onsite solar, 4MWh battery storage system, and a backup system that can provide power for up to 20 hours. The system will be connected to the grid, but can also enter island mode in the event of a grid outage. For extended outages, VTA has the option to easily connect a temporary generator to provide additional backup power for fleet operations. The microgrid and charging infrastructure will be linked together by a switchgear and controls package designed by Schneider Electric….*

*…The system is expected to be operational in 2023.*

[20] Anne Fischer, PV Magazine, "California bus company installs solar microgrid to power EV fleet," Jan 27, 2022, https://pv-magazine-usa.com/2022/01/27/california-bus-company-installs-solar-microgrid-to-power-ev-fleet/