Tesla Early 2022

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1. Introduction

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.

The last post that primarily dealt with Tesla is described and linked below:

Bottom-up, Tesla's Component Edge: *The best do sweat the small stuff. They get the seemingly insignificant details right. They have the discipline to shine at the baby things which they get gives birth to spectacular giant things." – Robin S. Sharma, Writer*

In other words, they sweat the components.

In observing Tesla for the better part of a decade, I know they do this, because of their results, because they constantly tinker with everything, and they design their products so they can do this (consider their fully connected EVs).

This post will look at components that Tesla is working on currently, and suggest how these might impact their future products. It will also look at third quarter 2021 results and other Tesla news.

https://energycentral.com/c/ec/bottom-tesla%E2%80%99s-component-edge

2. Fourth Quarter and 2021 EV Deliveries

The following are the fourth quarter and year-end 2021 EV deliveries with some historical results for context.

- Total 2019, 367,200
- Total 2020, 499,550 (up 36% year over year)
- First quarter 2021, 184,800 (up 109% year over year for quarter, but Fremont plant was shut down in mid first quarter 2020 due to Pandemic)
- Second quarter 2021, 201,250 (Up 122% year over year for quarter, but Q2 2020 was depressed by Pandemic, first redesigned Model S, including Plaid)
- Third quarter 2021, 241,300 (Up 73% year over year for quarter)[1]
- Fourth quarter 2021, 308,600 (Up 83% year over year for quarter)
- Total 2021, 936,000 (up 87% year over year)

[1] Joey Klender, Teslarati, "Tesla delivers record 241,300 cars in Q3, handily beating consensus estimates," Oct 2, 2021, https://www.teslarati.com/tesla-q3-2021-delivery-production-numbers/

3. 2021 Yearly Results

Tesla shook off supply chain issues to more than triple earnings from year-ago results, easily topping Wall Street's expectations for the quarter.[2]

The company had adjusted earnings of $2.9 billion, up sharply from $903 million a year earlier and well above $2.6 billion forecast by analysts surveyed by Refinitiv. Revenue of $17.7 billion was up 65% from a year earlier.

The results took full year earnings to $7.6 billion, and revenue to $53.8 billion.

CEO Elon Musk returned to the conference call with investors after missing the call three months ago. Six months ago he had said he would no longer be on calls unless there was "something important" that he needed to say.

The news he gave investors is that Tesla is putting plans for new vehicles on hold due to the supply chain issues facing the company. "We will not be introducing new vehicle models this year. It wouldn't make any sense. We'll still be parts-constrained," Musk said on the call. "We'll be ready to bring them to production, hopefully next year."

Tesla had been talking about numerous vehicles in its product pipeline, including the Cybertruck pickup, the Semi, a Roadster model, or a $25,000 car that would be less expensive than any of its current models.

Bringing a new product to market in 2021 "would have required a lot of attention and resources," Musk said. "The same is true of this year."

He added that the company is dealing with "multiple supply chain challenges" but provided no details. "The chip shortage, while better than last year, is still an issue," he said.

In its release, the company warned that in the most recent quarter it saw a continuation of global supply chain, transportation, labor and other manufacturing challenges, which it said limited its ability to run factories at full capacity.

Problems with the supply of parts, particularly computer chips, have been an issue for the entire auto industry for more than a year. Tesla has managed to keep increasing its output and sales in the face of those shortages. Its traditional automaker rivals, by contrast, were forced to temporarily shut their factories and limit production. That resulted in an industry-wide tightening of inventories of new vehicles and record high prices for car buyers.

By contrast, Tesla was able to ride the growing appetite for electric vehicles among car buyers. Estimates are that global EV sales increased to 4.5 million last year from 2.1 million in 2020, according to auto research firm LMC. Telsa's sales for 2021 came to 936,000, nearly double the 500,000 vehicles it sold in 2020.

"With the chip shortage still a major overhang on the auto space and logistical issues globally, this impressive earnings beat speaks to an EV demand trajectory that looks

[2] Chris Isidore, CNN Business via MSN, "Tesla reports record profit, but warns of continued supply chain issues," Jan 26, 2022, https://www.msn.com/en-us/money/companies/tesla-reports-record-profit-but-warns-of-continued-supply-chain-issues/ar-AATaU1g?ocid=uxbndlbing

quite robust for Tesla heading into 2022," said Dan Ives, tech analyst for Wedbush Securities.

Tesla said it expects to increase output at its existing factories in California and Shanghai, while ramping up production at new factories outside of Austin, Texas and Berlin.

"We believe there is potential to extend overall capacity [in its Fremont, California plant] beyond 600,000 per year," the company. "We believe competitiveness in the EV market will be determined by the ability to add capacity across the supply chain and ramp production," it said.

It said it started making its Model Y SUV, its newest vehicle, at its Austin plant late last year.

"After final certification of Austin-made Model Y, we plan to start deliveries to customers," it said. As to its factory in Berlin, the company said it is finalizing manufacturing permits from local authorities there.

The demand is clearly there for Tesla's cars, assuming the company can increase supply. It said that its supply of vehicles was down to an average of 4 days of inventory in the quarter, down from 11 days a year earlier and a 28-day average in 2017. Even in an industry dealing with record tight supplies of new vehicles that is an exceptionally low supply.

Tesla's earnings statement provided no details on when its Cybertruck pickup would be available, other than to say it will be built in Austin "subsequent to Model Y." The company is due to hold a conference call with investors later Wednesday evening.

Shares of Tesla, which had fallen 11.3% so far in 2022 through Wednesday's close, moved higher in post-market trading during the early portion of its investor call, after initially dropping following the earnings report.

Even so, Tesla shares are worth more than the market value of the 10 largest global automakers, despite being a smaller company than any of them.

4. Tesla Megafactory – More Information

Currently Tesla ships 4 GWh of their Megapack-based battery energy storage systems (BESS) per year.

In late September we broke the news that:

Tesla broke ground on its "Megafactory," a new production facility in California, so christened because it will produce the company's large-scale battery system Megapack.[3]

News of the previously unannounced factory was confirmed by the Lathrop Mayor Sonny Dhaliwal in a Facebook post that was deleted and re-posted. "We are proud to be the home of the Megafactory, Tesla's most recent expansion here," he said. "The future of green energy will be produced right here in our community…"

[3] Aria Alamalhodaei, Tech Crunch via Yahoo News, "Tesla's battery-manufacturing 'Megafactory' breaks ground in California," Sep 23, 2021, https://news.yahoo.com/teslas-battery-manufacturing-megafactory-breaks-153937916.html

This was in "**Photovoltaic & Storage for Fall 2021, Part 3, States.**" In early October some more information came to light on this facility:

At Tesla's shareholder's meeting, Tesla CEO Elon Musk was asked to specify the planned production capacity of the new Megafactory.[4]

The CEO didn't know on top of his head, but another Tesla executive reminded him and confirmed that Tesla planned to produce 40 GWh annually at the plant.

The next question is, why is Tesla building 10 times more large BESS manufacturing capacity than he currently needs? I believe I can answer that from another recent post.

Currently large photovoltaic (PV) projects are rapidly expanding as explored by subsection 3.1 of "Power Industry 2022 Trends & Predictions" that was posted in mid-January (link below).

https://energycentral.com/c/ec/power-industry-2022-trends-predictions

The follow-on trend in these projects is:

… Most states / regions seem to start with PV-only and then later start backfilling with PV + Storage or Storage-only projects.

This subsection used several earlier posts to track both large PV and Large BESS projects announced in 2021, but with completion dates ranging out to 2024. The nationwide result of this analysis was:

The following are the results of a completion-year sort on the 2021 database:

2021: 4,766 MW of PV and 714 MW of BESS

2022: 6,090 MW of PV and 1,237 MW of BESS

2023: 12,199 MW of PV and 1,690 MW of BESS

2024: 2,735 MW of PV and 355 MW of BESS

Although the above shows moderate growth of BESS, this "backfilling" mentioned above would dictate that a much larger bump will be required to mitigate the variability that will be produced by 2022, 2023 and later PV deployments.

5. Iron Batteries

It has been known for some time that Tesla uses LFP ($LiFePO_4$ or Lithium Iron Phosphate) batteries in their energy products, like Megapack. See the earlier post described and linked below, section 3.2.

[4] Fred Lambert, Electrek, "Tesla Megafactory aims to produce a stunning 40 GWh of Megapacks per year," Oct 8, 2021, https://electrek.co/2021/10/08/tesla-megafactory-aims-40-gwh-megapacks-per-year/

Tesla 2021 Update: *This post will focus on Tesla Mobility Products, but cover a wide range of subjects.*

https://energycentral.com/c/ec/tesla-2021-update

Also Tesla has been moving the batteries for their lower-cost vehicles to LFP Technology.

…The company is already making vehicles with LFP chemistry at its factory in Shanghai. It sells those cars in China, the Asia-Pacific region, and Europe.[5]

China generally promotes the use of this type of battery, according to materials researcher and consultant Roskill. The firm notes that around 95% of LFP cathode manufacturing is produced in China.

In September, Tesla asked Model 3 reservation holders in the US if they'd accept a car that had a battery made with LFP cells instead of the Nickel Cobalt Aluminum Oxide (NCA) cells that Tesla previously used for Model 3 sedans sold in North America.

"LFP has both positive and negative trade-offs," said Sam Abuelsamid, Guidehouse Insights principal analyst. "It's significantly cheaper and doesn't require any nickel or cobalt. It's also more stable, which makes it safer."

One major downside: The cells are less energy-dense, which means they offer lower range for the same weight as other cells. Cold weather also affects them more, Abuelsamid said…

Other automakers such as Ford Motor and Volkswagen have expressed interest in the battery chemistry for lower-priced models, according to Abuelsamid. He said it's also particularly appealing for commercial vehicles like delivery vans that don't need multi-hundred mile range.

As of mid-November, Tesla had started delivering their base Model 3 (RWD) with LFP Batteries:

…We assume that it has CATL's prismatic LFP batteries, imported from China, instead of Panasonic's 2170-type cylindrical NCA cells supplied from the Tesla Gigafactory in Nevada.[6]

Here are a few differences in the Model 3 (RWD) specs:

- *272 mi (438 km) of EPA range (estimated) - 10 miles or 3.8% more than SR+*
- *0-60 mph (96.5 km/h) acceleration in 5.8 seconds, vs 5.3 seconds in SR+*

The first Model 3 (RWD) cars are already in customers' hands in the U.S.

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[5] Michael Wayland, CNBC, "Tesla will change the type of battery cells it uses in all its standard-range cars," Oct 20, 2021, https://www.cnbc.com/2021/10/20/tesla-switching-to-lfp-batteries-in-all-standard-range-cars.html

[6] Mark Kane, InsideEVs, "Watch Tesla Model 3 RWD With LFP Battery Get Delivered In U.S.," Nove 26, 2021, https://insideevs.com/features/550444/tesla-model3-rwd-lfp-us/

6. Recall

The U.S. electric vehicle manufacturer is recalling 356,309 2017-2020 Model 3 vehicles to address rearview camera issues and 119,009 Model S vehicles due to front hood problems, the National Highway Traffic Safety Administration (NHTSA) said.[7]

For Model 3 sedans, "the rearview camera cable harness may be damaged by the opening and closing of the trunk lid, preventing the rearview camera image from displaying," the NHTSA said…

For Model S vehicles, front hood latch problems may lead a trunk to open "without warning and obstruct the driver's visibility, increasing the risk of a crash," Tesla said.

7. New Gigafactories

The big news for Giga Texas (from the earnings report/call, section 3) is:

It said it started making its Model Y SUV, its newest vehicle, at its Austin plant late last year.

"After final certification of Austin-made Model Y, we plan to start deliveries to customers," it said.

And Giga Berlin:

As to its factory in Berlin, the company said it is finalizing manufacturing permits from local authorities there.

Read: still tied up in German red tape. No firm date to start production.

8. The Fremont Mothership Excels

New data from Bloomberg states that Tesla's Fremont Factory in Northern California was the most-productive automotive plant in the U.S., outpacing 70 other plants in the country.[8]

Last year, Tesla's Fremont Factory averaged a weekly production pace of 8,550 vehicles. That's about 1,221 cars per day, 51 cars per hour, or about 0.85 cars per minute. However you break it down, the Fremont Factory's manufacturing prowess showed its domination in 2021, as it was the most productive automotive factory in the United States in 2021, outpacing Toyota, BMW, and Ford factories that have long created the most robust figures of car production in previous decades.

For comparison, Toyota's plant in Georgetown, Kentucky built 8,427 cars per week, BMW's facility in South Carolina managed 8,343 units per week, and Ford's Dearborn, Michigan hub managed just 5,564 vehicles weekly. All figures were provided by Bloomberg.

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[7] CNBC, "Tesla recalls almost half a million electric cars over safety issues," Dec 30, 2021, https://www.cnbc.com/2021/12/30/tesla-recalls-475000-model-3-model-s-electric-cars-over-safety-issues.html

[8] Joey Klender, Teslarati, "Tesla's Fremont Factory was the most productive auto factory in the U.S. in 2021," Jan 24, 2022, https://www.teslarati.com/tesla-fremont-factory-most-productive-auto-factory-2021/

The history of the Fremont Factory tells the story of long-standing automotive companies that simply vacated the factory to make way for the next big thing. In the 1960s, GM operated the plant. Then in 1984, Toyota's New United Motor Manufacturing, Inc. partnered with GM to run the plant. Ultimately, GM's bankruptcy in 2009 left the 5.3 million square foot plant vacant. Tesla took ownership in 2010, renovated several portions of the factory, expanded production availability (a project that continues to this day), and currently has more than 10,000 active employees at the plant. The Model S, Model X, Model 3, and Model Y are all produced at the site.

9. Final Comment

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.