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Tesla's biggest test

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Abstract: In the past year, electric vehicle maker Tesla Motors has posted its first quarterly profit, quintupled its stock price, and won a near-perfect score from Consumer Reports for the Model S sedan. In his book of the same name, Silicon Valley management consultant Geoffrey Moore describes "the early-adopter play" of startup companies, which have a high failure rate in trying to grow from a niche brand to mass-market stature.

Full text: In the past year, electric vehicle maker Tesla Motors has posted its first quarterly profit, quintupled its stock price, and won a near-perfect score from Consumer Reports for the Model S sedan.

Now comes the hard part.

Tesla founder and CEO Elon Musk wants the company's estimated 2013 U.S. volume of 20,000 units to soar to 250,000 -- and to 500,000 globally -- by the end of the decade. Such rapid growth would be unprecedented in the history of the automobile.

In an exclusive interview with Automotive News, Musk candidly acknowledged the challenges facing Tesla. He spoke with less bluster than normally heard in his public statements.

"We have a lot of work to do. We'll do our best to make it happen," Musk said. "I think we will, but this is not a bold assertion we unequivocally will. There is a possibility we may not."

Its initial order bank sated by true believers and early adopters, and its quarterly profit reports pocked with asterisks, Tesla now must win customers away from established luxury brands. To grow to its hoped-for volumes when its $35,000 Gen III cars arrive in a few years, it must transform from an automotive boutique to a volume automaker.

It will have to:

-- Convince skeptical mainstream shoppers that its electric-car technology won't leave them stranded on the roadside.

-- Finance a vehicle platform housing several variants, with a price tag likely to top $800 million.

-- Expand its sales and service capacity vastly.

-- Scale up its manufacturing output by a factor of 20.

"If Tesla wants to sell 250,000 cars a year here, Elon will have to heavily invest in infrastructure and in running a big, big company," said a veteran executive who has worked for Detroit 3 and Japanese automakers. "That's a lot different than what he's doing in niche volumes right now."

In interviews with Automotive News, top automotive executives dispassionately analyzed Tesla's enormous strategic and tactical hurdles. Speaking on condition of anonymity, because they were commenting as individuals and not as representatives of their companies, the executives pieced together what Tesla would have to do to succeed.

These executives don't wish to see Tesla fail. They respect and admire what Musk has done. But each expressed concern that the auto-maker's ambitions may overreach its abilities.

"To go from 2,000 to 20,000 units is already pretty impressive," said one executive at a German brand. "We are clearly seeing high professionalism behind it. It's a nice product. It's a nice story.

"Now the question is how strong do you need to be to continue telling that story, to move from 20,000 to 200,000."

Here's an analysis of the challenges Tesla faces.

GROWTH

The strain of expansion as new rivals roll out EVs

Tesla was on pace to sell about 20,000 Model S sedans in 2013, and expects to double that figure this year as it expands further into global markets from its initial inroads in Western Europe. China sales begin this year. And when the Model X crossover arrives in volume in early 2015, Tesla believes it will reach a global annual pace of 80,000 sales.

Tesla wants the Gen III sedan, expected to go on sale in 2016 or 2017, to push total U.S. volume to 250,000 units a year -- putting Tesla in the same volume ballpark as Mercedes-Benz, BMW and Lexus, and selling nearly six times as many cars as Porsche.

Musk downplays the goal, saying that a rise to 250,000 units is "not exactly running away with all the money." But Tesla's established rivals will fight passionately to keep their market shares.

Efraim Levy, an analyst with Standard &Poor's, sees increased competition as a major challenge to Tesla's ambitions. Luxury brands such as BMW and Mercedes as well as volume brands are offering capable electric vehicles of their own. Tesla won't be the only choice for long-range zero-emission transportation.

"They're not going to have the market to themselves," Levy said. "There's a lot that has to go right."

Tesla's product capability has won respect in the industry and among consumers. Consumer Reports last year awarded the Model S a score of 99 out of a possible 100 in its tests. It said that the Model S "performed better, or just as well overall, as any other vehicle -- of any kind -- ever tested byConsumer Reports."

But now, in venture capital parlance, Tesla is "crossing the chasm." In his book of the same name, Silicon Valley management consultant Geoffrey Moore describes "the early-adopter play" of startup companies, which have a high failure rate in trying to grow from a niche brand to mass-market stature. Moore places Tesla firmly in that category.

"The product has to have mass-market appeal. While the Tesla is stunning, there are a lot of things that it is missing," Moore said in an interview, citing a lack of infrastructure, large-scale charging networks and mass-market appeal. "Inertia is against them. It's not like selling iPods."

RETAIL

Can Tesla's stores handle a big increase in shoppers?

Musk says Tesla's growth hinges on the Gen III car being "the best car in the world at that price range." But industry insiders say that will be irrelevant if the retail model doesn't work.

Tesla insists it will maintain its Apple store sales model, in which cars are marketed through boutiques in shopping malls. But the foot traffic required for a hot startup brand to sell 20,000 cars a year is much different from what's needed to sell 10 times that number after the initial buzz has passed.

The automotive industry has a proven statistical model called the "purchase funnel," in which customers' awareness of a vehicle progresses from consideration to preference and, finally, the purchase. The mathematical formula for each step is exponential, meaning the funnel of actual buyers is much narrower than those who are aware of the product. According to several automotive retailing experts, it takes from five to eight prospects walking into a dealership for each retail sale.

Do the math: In order to sell 250,000 cars a year, based on that model, 1.25 million to 2 million customers would have to walk into a Tesla store. And, arguably, a shopping-mall location combined with the novelty of new technology would draw such a high percentage of looky-loos, as opposed to hard-core shoppers, that the traditional ratio might not hold.

Even if it does, Tesla's current store presence, employee count and capacity for test drives cannot support that sort of customer throughput, executives unanimously agreed. Tesla currently has 49 stores in 23 states.

Many executives believe Tesla cannot hit 250,000 units a year without a franchised dealer network that can manage such scale. Even with 125 retail outlets, that would still be 2,000 new cars per outlet per year. That sort of volume requires real estate. Since Tesla sells mostly in big cities, that's an expensive capital outlay.

"Once you get to 100,000 sales a year, you have the infrastructure to get to 250,000," said an executive who has worked for several Asian brands. "But there is no way to get past 100,000 units with the model he's got. The issues Elon has are biblical in nature."

Industry executives predict Tesla will need to join with an established dealership group that will allow the company to spread its retail and service wings in states that restrict Tesla factory stores.

But Musk says he will not consider such a proposition. Maintaining control of the retail process is key to him. And he says skeptics are overstating the need for a huge dealer network because word-of-mouth plays a larger role for Tesla than for other brands.

Musk says four Model S sedans are sold by word-of-mouth, rather than by conventional marketing, for every one sold as a result of someone walking into a store off the street.

"I don't think we're going to need an enormous amount of stores. We'll have some flagships in major markets," he said. "What will sell cars in the long term will be other customers -- word-of-mouth."

PROFITS

In the black, yes, but only by one measure

Tesla has wowed investors with quarterly profits, but the profits have come with a slew of asterisks.

In the second and third quarters of 2013, Tesla's profits were realized only by using financial measurements outside generally accepted accounting principles.

Tesla's reported profits of $26 million in the second quarter of 2013 and $16 million in the third quarter actually were net losses of $30.5 million and $38 million, according to general accounting principles. Subtracting out zero-emission and clean-air credits pushed the losses even further.

So far, Tesla's nonstandard accounting has not raised any eyebrows at the Securities and Exchange Commission or at Wall Street brokerage houses. But pessimistic investors have made Tesla's stock among the most "shorted" -- meaning they expect the stock price to fall in the future.

Musk says "there is a lot of misunderstanding" about the way Tesla calculates its vehicle-lease profits. He says Tesla is using the "most conservative" accounting methods possible.

He said Tesla's grants of stock options have "penalized our earnings because our company became so valuable, but it doesn't affect our cash flow. It's not as though it was a real expense to the company. It's not like we had to cut a check to the person."

Auto executives note that Tesla is deleting routine operating costs -- such as r&d engineering -- from its income statement calculations to realize a profit.

If Tesla wants to be perceived as a viable automaker, they say, it has to play by the same rules as all automakers.

BATTERIES

Cost, range for $35,000 car 'no problem,' Musk says

Tesla's losses -- based on generally accepted accounting principles -- have come while selling a car that retails from $70,000 to $100,000. A big portion of that cost comes from the battery pack. And veteran EV engineers do not foresee a technical leap for batteries comparable to the semiconductor industry standard that speeds double, while costs are reduced, every 18 to 24 months.

"Investors are counting on the Gen III vehicle becoming a mass-market car," S&P's Levy said. "Tesla has to get costs down, especially battery costs."

Added a top Japanese car company executive: "Unless there is a big change in battery technology, I'm still not sure how you can sell EVs to the masses. Elon's car's performance is outstanding, but it's $100,000.

"So unless you get batteries that have more efficiency in a smaller space at a lower cost, it's going to be hard to replicate that at $35,000."

Musk disagrees. He declined to give details, but says he sees Tesla achieving battery cost reductions within three years, "no problem, with no miracles."

CASH

Gen II platform, variants require huge capital spending

Although media hagiographies of Musk paint him as a modern-era Henry Ford, Tesla's cash position puts him more in the camp of Henry Kaiser.

Kaiser, who became rich building dams and bridges during the Depression and then parlayed that into further fortunes as a shipbuilder during World War II, decided to take his profits and enter the postwar car business.

But Kaiser never was able to make the massive capital expenditures required to be a legitimate automotive player. He lost money every year and eventually merged his failed business with Willys-Overland, the creator of the Jeep.

In that era, experts say, it would have taken Kaiser $300 million to launch an entity to challenge the established giants. That's $3.5 billion in today's money.

According to Tesla's third-quarter filing with the SEC, the automaker has $795 million in "cash and cash equivalents."

So far, Tesla's ability to build cars was largely a result of Musk's aggressiveness at a time when everyone else was paring back.

With the recession raging, Musk went shopping. Tesla bought Toyota's $800 million New United Motor Manufacturing Inc. factory and much of its tooling for $59 million -- and then Toyota injected $50 million in venture capital into Tesla.

Tesla then bought a $50 million Schuler SMG hydraulic stamping press from a distressed Detroit supplier for $6 million -- a price that included shipping the hulking tooling on 70 trucks to the plant in Fremont, Calif.

For $15 million, Tesla had acquired the basic building blocks to become a car manufacturer -- a 98 percent discount off sticker price.

But heavier spending will be needed for expansion. The NUMMI plant was built to assemble 450,000 cars a year, and Musk intends to fill it. In the closing notes of Tesla's second-quarter letter to shareholders, Musk noted that Tesla expected to spend about $150 million in the second half of 2013 on capital expenditures, including the purchase of 31 acres adjacent to its Fremont factory to increase production.

Vehicle development is also costly. Automotive platform engineering from scratch typically costs $400 million to $1 billion. Each derivative vehicle off the base platform costs an additional $100 million to $250 million.

Tesla's Gen III cars will be on a different platform from the Model S and Model X. In interviews, Musk has said he wants Gen III to spawn a sedan, coupe, crossover, sports car and convertible.

If all those products are created, Gen III will cost Tesla $800 million at least, $2 billion at most, in r&d costs, according to product development experts.

And that doesn't count the pickup Musk said he wants to build. That's another platform.

What's more, Tesla is doing this engineering in Silicon Valley -- one of the world's highest-cost white-collar labor markets.

"Prototyping, stress tests, durability, quality checks, crash tests ... that's where all the costs are," an EV industry executive said. "Then there's all that tooling. Just to make a molded door handle is $10,000. That's one part."

Another big capital cost will be for battery manufacturing. If Tesla builds 500,000 units globally a year, the automaker would chew up nearly all the world's lithium ion battery production.

In his third-quarter earnings call, Musk said he would build a battery "giga-factory" with a partner that would serve all of Tesla's supply needs. Musk said he is looking at Texas for a plant site, but declined to give a cost target.

By comparison, LG Chem's battery plant in Holland, Mich., cost $303 million to build. Its capacity is a mere 60,000 packs annually.

While declining to comment on future financing, Musk expressed his belief that Tesla can fund its planned expansion "out of internal dollars," adding, "We may need funding for the giga-factory."

OVERSEAS

Will tradition-loving markets welcome an upstart import?

Selling additional units overseas also poses challenges. Executives who have worked in Europe and China say those markets place a higher premium on heritage than on the latest cool brand. Customers in those markets would rather wait for a hybrid or EV from Mercedes, BMW or Porsche than buy a Tesla.

"We have more nouveau riche [in America], but the European and Asian luxury buyer seriously wants more pedigree," the former Detroit executive said. "Look at the lack of success of Lexus and Infiniti in Europe.

"Tesla will get the newbies. But to get a high cross-shop against German brands will be even more difficult in Europe."

A former executive with a smaller Japanese brand, who has experience in China, predicts Tesla won't get sales traction there. The Chinese government's push for EVs has cooled of late.

"China is all about natural gas," the executive said. "They don't trust EVs, especially when natural gas is available and accessible. It's simply not an EV-friendly market."

Also, much of China's urban citizenry lives in apartments and townhouses, which would have trouble getting access to any EV charging infrastructure -- further complicating Tesla's goal there.

MARKETING

Wider range of buyers will require more charger options

Tesla's well-to-do buyers can afford $75,000 to $100,000 EVs. Often, a Tesla vehicle is the second or third car in a household. For Tesla to increase sales significantly, Gen III cars must be priced much lower.

While that would expand the potential buyer base, it also would mean that the car is the primary transportation for its owner. And that's where Tesla's business model runs into trouble, some skeptics say.

"People who buy a $35,000 car drive it differently than people who drive a $100,000 boutique car," said a veteran executive of Detroit and Japanese companies. "It will be a daily driver. That's an entirely different expectation."

For well-heeled Tesla early adopters, the cost of converting their homes to run a 220-volt charger -- even one from solar panels -- is not a hardship. But for someone looking at a $35,000 Gen III car, installing a home charger could be prohibitively expensive. Prices for such an installation range from several hundred dollars to as much as $10,000 if adding solar panels and new circuit breaker boards.

What's more, Tesla's EV message is aimed largely at major metropolitan areas. And many potential buyers of the $35,000 car will be living in apartments, condos or townhouses, where the ability to install a charging port could be restricted by logistical problems or building code restrictions. That means Tesla will have to make up the difference by adding Superchargers, the company's recharging stations.

Even with just 20,000 Teslas on the road, there already are waits at many Superchargers, most of which are positioned between cities. Being fourth or fifth in line means waiting well more than an hour before plugging in. Musk said he will greatly expand the number of Superchargers nationwide -- including stations in major metro areas by year end.

But if Tesla wants to sell 250,000 cars a year, how many Superchargers will that entail if the network is stressed with 20,000 cars on the road? Each station costs $200,000 to build in remote areas, but with 1 million Teslas on the road by 2020, the stations might have to be ubiquitous in more-expensive urban locales, an EV industry veteran said.

"That issue will be a showstopper for nonurban markets in places like Salem or Modesto or Cheyenne," Moore said. "When the mass-market car comes in three years, there has to be a minimum infrastructure in place."

SERVICE

More cars mean more bays, parts and technicians

On the service side, Tesla is making do with mobile service vans and pop-up service centers near concentrations of Tesla buyers. Again, that model may work for 20,000 annual sales, but servicing the higher

volumes Tesla envisions is another matter. How many service vans would be required once Tesla's units in operation reach 1 million?

Tesla vehicles, by being electric, require less maintenance and service parts than internal-combustion cars. But there are plenty of parts -- suspension pieces, brake pads, tires, window lifts, seat-position solenoids, wiper arms, climate control servos and body panels -- that wear out and need replacing.

An established car brand that sells about 250,000 units a year typically has 1,000 employees in the fixed operations departments at headquarters and in the field, on top of the thousands of technicians who work in dealership service drives.

Tesla already is having difficulty filling spare parts orders. Several Tesla owners involved in fender benders say they had to wait six weeks for replacement body panels to be shipped to a local body shop.

Musk said Tesla will add 150 to 200 remote service operations this year. According to its Web site, Tesla has 40 operational service centers in 21 states. The company declined to state how many service vans it has and how many service calls it has fulfilled.

A top executive at a German luxury automaker doubts that Tesla's mobile-repair model will work once the brand gets a large units-in-operation count.

"It's not only about building the service bays, but finding the technicians, which is often a challenge," the executive said. "The Tesla model really works at this current volume level, but how will it work going forward with the aspirations they have?

"You have to ask if the service model scales."

REMARKETING

Residual guarantee could be expensive

Another concern for Tesla is what happens to its cars when they enter the used-vehicle fleet. Musk has guaranteed that after three years, the Model S will have a residual value on par with the top-valued vehicles in the luxury-sedan segment. That would be 50 percent retained value.

But a recent KBB.com report placed EV residual values far below those of standard automobiles. The Nissan Leaf, for instance, has the lowest residuals of any vehicle in the industry -- just 18 percent after five years.

Eric Ibara, director of residual value consulting for Kelley Blue Book, said the much greater range of the Tesla Model S puts it in a different residual pool from the Leaf. But he says he's not sure Tesla can meet the luxury brand residual-value standard. The Model S has a top range of 265 miles and the Leaf, 75 miles, according to the EPA.

"It's tempting to extrapolate from Leaf to Tesla, but you can't make that direct comparison," Ibara said. "It's quite possible the Model S could be right in there with other luxury cars. But it's precarious for Tesla right now."

Musk said it doesn't make sense to compare the Model S with the Leaf.

"We don't have a lot in common with Leaf," Musk said. "The Leaf is a so-so product at a value-for-money number that makes questionable sense. [Nissan] had to drop the price, which will make residual value percentages suck. Whereas the Model S is an amazing value for money."

Why are residual values so important? If Model S values at auction don't meet Musk's guaranteed value, Tesla winds up stuck eating the difference.

Even if Tesla values come in at the low end of the luxury-sedan segment average, that's a 10 percent swing. On a $90,000 car, that's almost 10 grand a pop. Multiply that by 20,000 sales this year, and Tesla is looking at a $200 million shortfall just for 2013's sales when the cars come back in 2016.

Another question about used Teslas: the condition of the battery pack. Although people buy used cars knowing the engine has some wear and tear, most used EVs' battery packs will have been permanently drained to 80 to 85 percent of their original state after three years.

That's the equivalent of telling people their cars will go 20 percent fewer miles on a tank of gas. That's a hard sell.

But Tesla will not swap out the battery packs on a 3-year-old Model S, Musk said. He added that it's unfair to compare Leaf battery degradation with that of a Tesla. "It will still be going strong after three years," Musk says. "The Leaf battery is a quarter of the size of the Model S pack."

He predicts zero degradation after three years because the load on a Tesla pack is minimal compared with that of a Leaf. The Leaf is "putting a lot of load on that small pack, and its thermal controls are not very good, and if you don't maintain thermal conditions, the battery will degrade a lot faster."

THE PRIUS EXAMPLE

After luring the early adopters, the next step is more challenging

Only one vehicle has entered the alternative-fuel segment, hit the early adopters and grown to mass-market acceptance in less than a decade: the Toyota Prius. And Toyota was a massive corporation with $35 billion in spare cash.

A Toyota executive who was present for the launch of the first Prius said the period after the honeymoon is the hardest. That's the phase Tesla is entering.

"When the early adopters came in and snapped up the first cars, we were managing demand," the Toyota executive said. "That lasted 18 to 24 months.

"But the last two years of the first-generation car were a challenge. We were in the retail business, but also pushing with education and marketing. And we did not want to have incentives. That is a lot of work."

Plus, while brands such as Porsche, Mercedes and BMW are established luxury marques, Tesla is the newcomer. Although that has a certain appeal, once it has been on the market for five years, can Tesla maintain that buzz when established brands launch competitive EVs?

"It's the new cool thing on the street," said a veteran executive of Detroit and Japanese automakers. "But is Tesla a marry brand or a date brand? How sustainable is the buzz for such a brand?"

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In addition to all these issues, there is concern that Tesla may be the poster child for the next Wall Street bubble. From a stock price in the low $30s in March, Tesla surged to nearly $200 within six months before falling back to $120 in November.

Tesla shares are now trading at around $150, giving the company a market capitalization that's still above those of Fiat and PSA Peugeot Citroen combined.

"It's very easy to get swept up in the enthusiasm," Moore said. "But we can't suspend the laws of physics or economics for them. ... They have a list with some 'We need a miracle' items."

From his perspective, Musk doesn't see Tesla requiring any "eureka" moments.

"Destiny is in our own hands," Musk said. "If we don't succeed, it's our own fault."

Nick Bunkley contributed to this report.

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