Tesla hits bumps in pursuit of mass market

Delays and snags risk hobbling of ambition and lead to a sharp scale back of targets

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Problems at Tesla's battery plant in Nevada have been blamed for production delays to the Model 3 mass market electric car © FT montage / AFP / Bloomberg

The road ahead for Tesla is strewn with potholes.

The electric carmaker is attempting to become a mass market player by producing hundreds of thousands of affordable Model 3 vehicles.

But snags, partly of its own making, risk hobbling this ambition and have already led to severe delays over its short-term targets.

Last quarter it aimed to make 1,500 Model 3 vehicles. In the end, it produced

just 260.

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>
> ***Former Tesla senior director***

On Wednesday night, Tesla pushed back its target of making 5,000 Model 3 cars a week by three months to March, blaming delays chiefly on its Nevada battery factory.

"There are thousands of processes in creating the Model 3," Elon Musk, Tesla chief executive, said on Wednesday. "We will move as fast as the slowest and least lucky process among those thousands."

Tesla's shares fell by 6.8 per cent on Thursday. This was partly due to tax changes planned by the US government that will wipe out an incentive for electric car buyers that was crucial to the appeal of the Model 3 and other mass market electric cars.

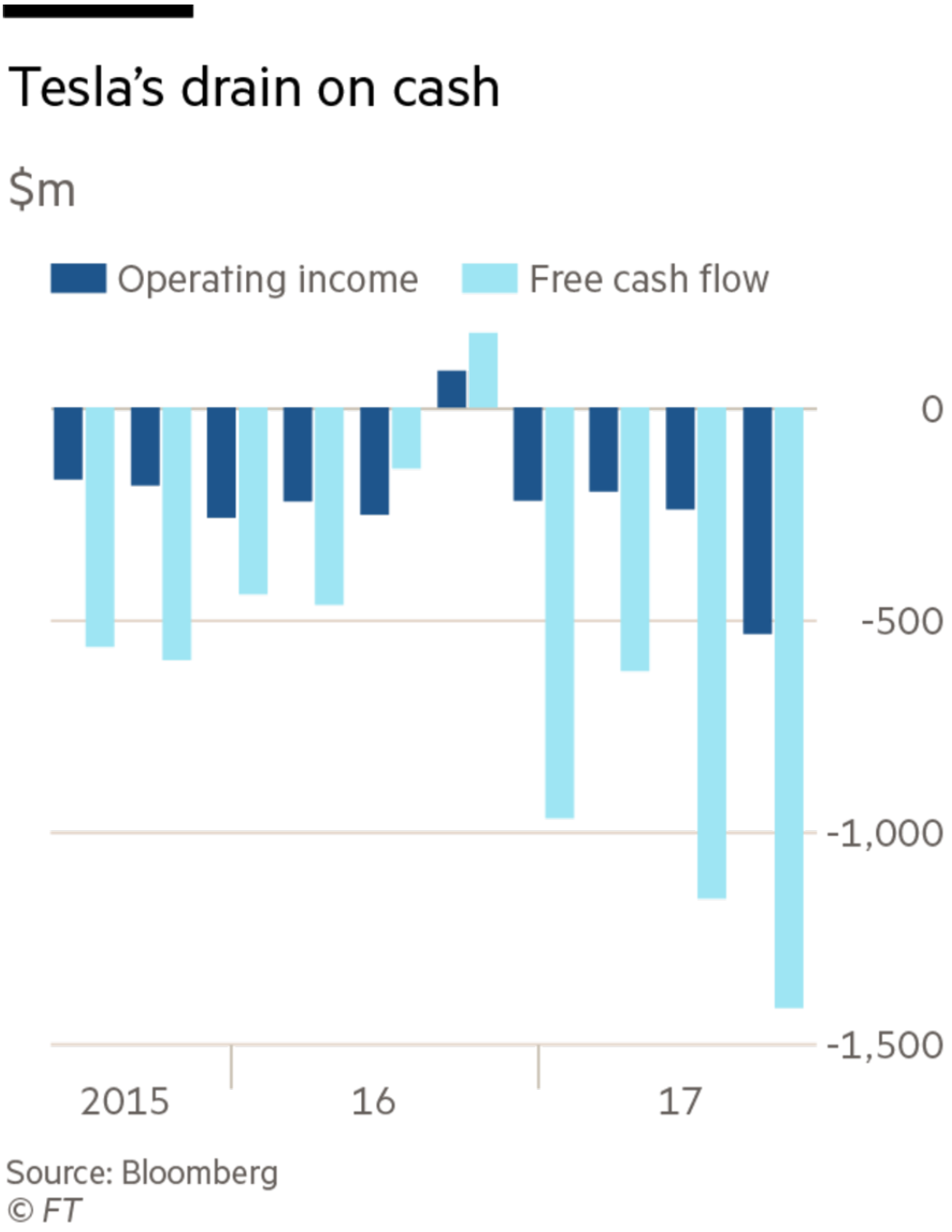
The Financial Times, through more than a dozen interviews with people close to Tesla's production operations over several weeks, has identified a number of other processes that Mr Musk may come to describe as "unlucky".

Potential problems uncovered include workers in its Fremont plant manually operating robots that should be automated, several cost overruns and delays from suppliers because of late changes to design specifications, and difficulties sequencing parts once they arrive at the plant leading to a large number of unfinished vehicles coming off the line.

Many of the problems are described by several automotive manufacturing experts as "basic", and stem from Tesla's desire for breakneck speed in its product development and manufacturing.

“Tesla can bring in the smartest people, but then if they are told to do what the boss wants it’s just wasted expertise,” says a former senior director at the carmaker.

During quarterly results on Wednesday that showed a 67 per cent rise in post-tax losses to $671m, Tesla laid out some of its production “bottlenecks”.



The company said a subcontractor in its battery factory “really dropped the ball”, forcing some workers to build battery packs by hand instead of using

the automated system it had installed.

“It’s really inefficient,” Mr Musk said.

However, the situation that Tesla described is also replicated at its main Fremont assembly plant in California, according to several people who have witnessed the production process.

Newly-installed Kuka robots designed to speed up production are still being operated by hand, according to two people who visited the site in recent weeks.

“I have never seen so much manual labour on a line,” says one person, who has inspected car plants all over the world.

“It was swarming with people. When I go to a plant and it’s automated I expect to see a lot fewer people.”

At Nissan’s Sunderland plant in the UK, which is regarded as one of the most efficient facilities anywhere in the world, the company estimates that just six minutes of downtime on the line pushes the operations into a loss.

One person who visited the Tesla site noted the line was frequently halted for quality inspections.

“It was not efficient,” says the person.

A Tesla spokesman said the production line contained both manual and automated elements, and referred to a previous statement by the company on the question of its automation that says: “As we’ve always acknowledged it will take time to fine-tune the line for higher volumes, but as we have also said, there are no fundamental issues with Model 3 production or its supply chain, and we are confident in addressing the manufacturing bottleneck issues in the near-term.”

The high level of automation is part of Tesla's effort to streamline its operations.

"They are obsessed with manufacturing efficiency," one long-term shareholder told the Financial Times.

On the analyst briefing call on Wednesday, Mr Musk highlighted the aerodynamics of the robotic arms in the factory as being an area ripe for increased efficiency.

“I think speed is the ultimate weapon when it comes to innovation or production,” he said.

Tesla is no stranger to taking unusual approaches to save time.

In multiple instances, the company shipped cars from the factory that lacked key parts such as computer modules, digital displays, or even seats.

These parts were flown to Tesla-owned dealers, who then assembled them into the vehicle before completing the shipments to customers, according to several people familiar with the practice.

“This goes back years,” says a former regional executive, who declined to be named.

“It was common, common in every market — the seats, the displays were being flown in.”

The practice, while unorthodox, does not breach disclosure rules as Tesla does not book deliveries until the customer takes ownership of the car, the person stressed.

However, it does raise questions over whether the vehicles were adequately checked and calibrated before being delivered to users.

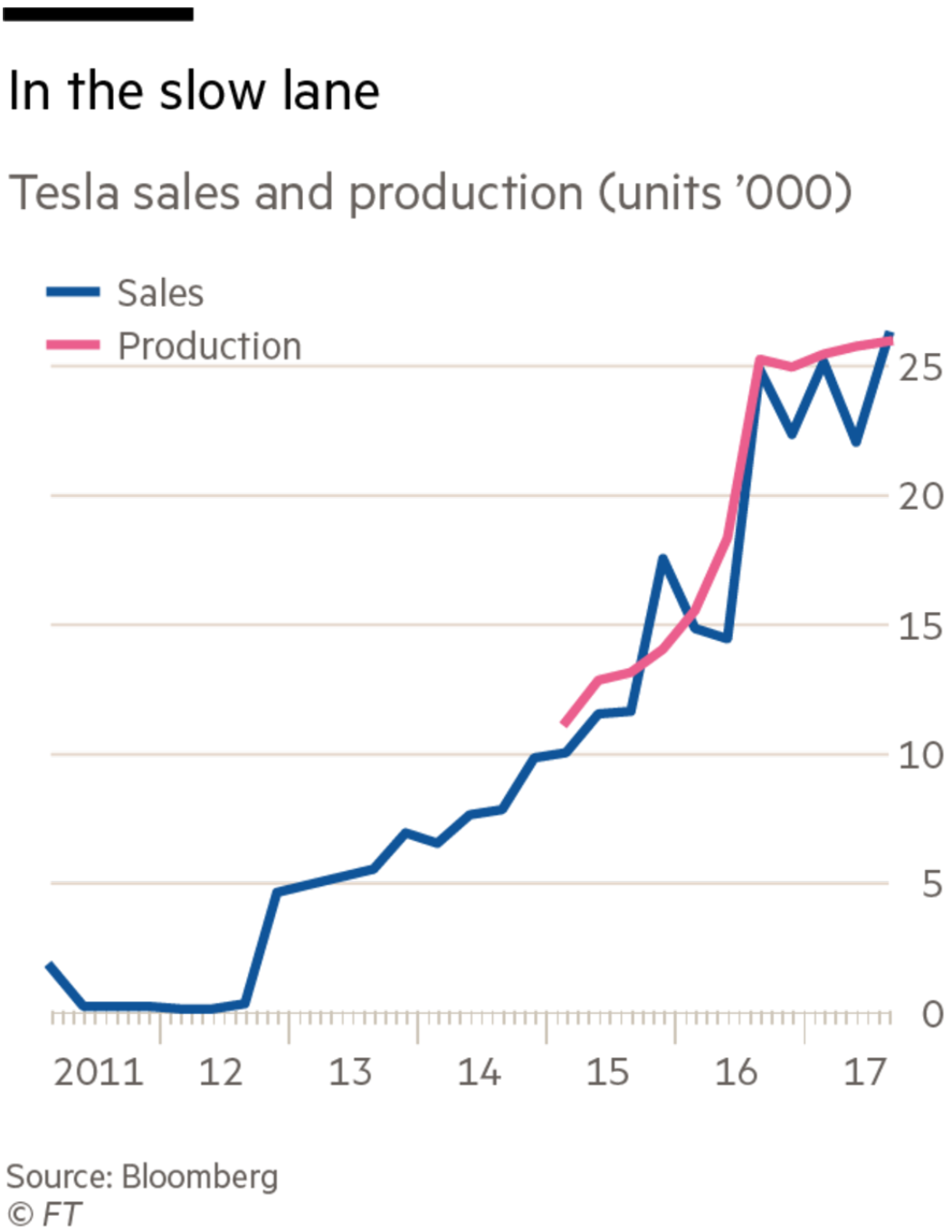
A Tesla spokesman said: “Tesla is constantly improving its cars with over-the-air updates and often design and hardware improvements. Occasionally we will even send, say, new certified parts to meet a car at the delivery center if those items have been upgraded after the car has shipped.

“This process may be unfamiliar to some, but has worked very well for us.”

While the unusual practice may work while it makes tens of thousands of cars a year, that would be totally unsustainable at higher volumes.

Tesla, which has so far produced 250,000 cars in its 14 years as a company,

wants to make 1m cars a year by 2020.



Another area of potential weakness in the Model 3 process is Tesla's relationships with its suppliers, according to at least four people.

Tesla insists there are no problems with its supply chain.

But in at least one instance, a supplier was told to manufacture a crucial part more quickly than was standard, only to have the design changed after the business had begun installing tooling, according to two people involved in the

supply chain.

“They [Tesla] showed complete befuddlement,” says one person who was involved in the process.

“Tesla kept saying ‘you need to make it faster’,” the person added. “But any time you make changes [to the design], you go back to the start of the process.”

“The automotive supply chain is miles and miles long but an inch thick,” says Ted Mabley, an automotive supply chain consultant. “Any time there’s a ripple, it goes the whole length.”

Then there is the issue of managing the components.

The key to an efficient car plant is matching up parts with their intended vehicles as fast as is reasonably possible once they arrive on site in a process known as “sequencing”.

“The process is really complicated,” says one person who worked for Tesla on improving efficiency in the Model 3 production process, but no longer works with the company.

“If you get it wrong, components pile up coming into the factory, and cars come off the end of the line incomplete.”

This is exactly what has happened, according to two people who have knowledge of the production process, and a large number of parts have been stored at the factory.

This is also consistent with several suppliers contacted by the FT, who had tooled up to Tesla’s requirements and fulfilled their deliveries to the company, even though the number of cars Tesla actually produced was well below expected levels.

Analysts have also calculated that Tesla's "work in progress" — an industry term for costs tied up in unused goods and materials — is many times higher than other more established carmakers.

Jefferies calculates Tesla's work in progress at 14 per cent of its total sales — compared to 2 per cent at BMW and 4 per cent at Volkswagen.

Mr Musk has said that current delays will be forgotten in the long term.

But as reservation holders received emails this week telling them their orders would be delayed, Tesla's teething pains hold a greater risk — that the near-half a million waiting customers with $1,000 deposits for a Model 3 pull back their money and spend it with a different carmaker.

Additional reporting by Patrick McGee in Frankfurt

Building a car is harder than you think

Making cars at scale is difficult, and Tesla is not the first company to discover that, *writes Peter Campbell.*

Barriers to entry in electric vehicles are substantially lower than conventionally-engined vehicles, which explains the proliferation of start-ups developing battery cars.

This is especially the case in China, where more than a dozen companies have been granted a licence to make electric vehicles, despite never having operated a manufacturing plant before.

At least one of these — Faraday Future — has cancelled plans for an ambitious factory in Nevada, despite taking orders for its first vehicle and launching impressive prototypes.

Other companies, such as Apple, have looked at making vehicles before pulling back and deciding to focus on software instead.

“There are plenty of very rich people out there who think they can build a car company,” says Ian Robertson, a board member at BMW.

“They are beginning to realise it’s more difficult than they understood.”