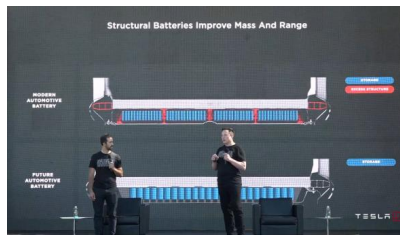


Tesla moves to cobalt-free silicon battery cell with a new form factor

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Tesla is combining a silicon anode, cobalt-free cathode, tabless cell design, high speed manufacturing and a new form factor to slash the cost of vehicle battery packs

Electric car maker Tesla has developed a cobalt-free, silicon lithium ion battery cell that is says will dramatically change the way cars are powered.

The cell is in a new, larger form factor measuring 46mm in diameter and 80 mm long. This compares to the previous 1865 and 2170 cells that are 18mm and 21mm in diameter.

“We have a plan to halve the cost per kWh with engineering and industrialisation,” said Drew Baglino, senior vice president of powertrain and energy engineering, speaking at Tesla’s Battery Day (above left).

This part of a plan to scale battery cell production to 20TWh per year. The current battery Gigafactory in Nevada built with Panasonic will produce 150GWh a year. “We would need 135 gigafactories like that,” said Baglino.

The new cell is key to the scaling up of production. It uses a tables construction with a dry electrode process acquired from ultracapacitor maker Maxwell Technologies, with a simple silicon anode and cobalt-free high nickel cathode. The electrolyte wasn’t mentioned though.

All of this is built on a high speed continuous production line similar to a bottling plant. The pilot plant in Fremont California has made tens of thousands of the new cells, but the yield is a problem, says Elon Mush, CEO of Tesla.

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“The dry coating they had was proof of concept and we have revised the machine four times since the acquisition,” said Musk. “There is still a lot of work to do to go to pilot to volume production, its insanely difficult to scale up, but we have made tens of thousands of cells. The yield is not good but there is a clear path to success,” he added. “We will probably be on machine revision 6 or 7 for volume production with a new rev every three or 4 months.”²

The new line produces 20GWh of batteries, 7x

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