

THE BIG PICTURE

CATL's Super-Charged Trajectory

How CATL came to dominate the EV-battery market, and how it has positioned itself to reap rewards from the coming boom in renewable energy.

BY ELIOT CHEN — OCTOBER 10, 2021



Credit: Martin Schutt/picture-alliance/dpa/AP Images

In early 2017, employees of Chinese battery manufacturer [Contemporary Amperex Technology Co. Limited](#) (CATL) received an [email](#) from their boss, asking: “Will pigs fly?”

Buoyed by government subsidies, CATL was growing quickly and doing well financially. But its CEO and founder Zeng Yuqun was worried even so. Invoking the Chinese allegory, ‘when the typhoon comes, pigs will fly’, he questioned what would happen when the ‘typhoon’ of state subsidies for the electric vehicle industry had blown through.

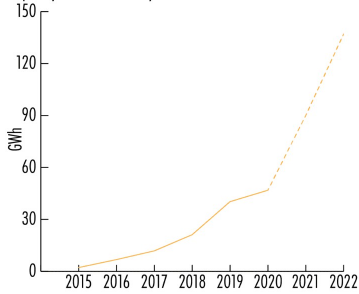
Yet fly CATL has. Between 2017 and 2020, its annual revenue increased two and a half times to \$7.8 billion, while its share price is up by more than 130 percent over the past year giving it a market value of \$190 billion. It now holds around one-tenth of the world’s lithium-ion battery manufacturing capacity, a proportion expected to expand further, according to commodities consultancy Roskill.

CATL’s customers include major vehicle manufacturers such as Tesla, Honda, Hyundai, Toyota, and Volkswagen. And its overseas expansion, including the [establishment](#) of a new battery factory in Erfurt, Germany in 2019, means the company is well positioned to ride the electric vehicle wave that analysts predict will sweep Europe in the next [four](#) years.

This week, *The Wire* looks at how CATL came to dominate the EV-battery market, and how it has positioned itself to reap rewards from the coming boom in renewable energy.

Battery Sales

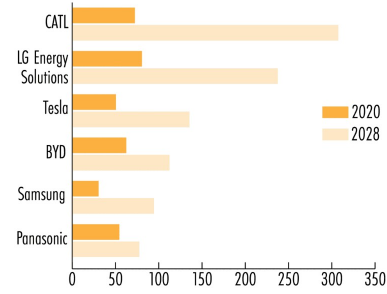
In 2015, CATL's lithium-ion battery sales totaled just 2.8 gigawatt hours. In 2020, it sold 46.84GWh, a sixteen-fold increase. CATL expects to increase its annual production capacity to 137 GWh by 2022.



Data: Annual reports and press releases. Projections come from company announcements

Global Competition

CATL and LG Energy Solutions compete for first place in annual lithium-ion battery production capacity. But CATL's 2028 projections far exceed any of its competitors'.



THE RIGHT CHEMISTRY

CATL's success hasn't always been assured. State subsidies which favored automakers that sourced batteries from Chinese suppliers originally boosted its position in the Chinese market. And although foreign automakers with factories in China [complained](#) about slow production and high prices, they had little choice but to buy from CATL. In 2019, the company became the world's largest battery maker by installed production capacity.

That same year, the Chinese government announced it would phase out its electric vehicle subsidies. Even so, the company has succeeded in retaining big customers and growing its business globally.

One big reason for this is CATL's ability to undercut rival battery makers on price, largely through controlling its own costs. "CATL's activities cover the whole supply chain, from the mining and processing of raw materials to battery components and recycling," says Kevin Shang, a battery materials analyst at Roskill.



Data: CATL company website, news reports

In September, CATL [acquired](#) Canadian mining company Millennial Lithium for close to \$300 million, narrowly outbidding another Chinese battery maker, Ganfeng Lithium. Its acquisitions have aligned with a national drive to buy up supplies of critical minerals from around the world — China already [controls](#) much of the world's supply of cobalt, a key ingredient for EV batteries.

But another reason behind CATL's success is its bet on producing an alternative battery type which doesn't rely so much on cobalt.

Most of CATL's rival battery manufacturers have gone all-in on battery chemistries with high energy density known as nickel-cobalt-manganese (NCM) and nickel-cobalt-aluminium (NCA), which enable vehicles that use them to travel farther. The soaring cost of nickel and cobalt has hammered many of these battery makers, with futures prices for both metals having risen by over 50 percent since the start of 2020.

Safety concerns involving faulty NCA/NCM batteries catching fire have also alarmed consumers and regulators, particularly in China, where 85 [percent](#) of electric vehicle-related fires in the first half of 2020 involved such batteries. In February of this year, Chinese regulators [summoned](#) Tesla — a leader in NCA battery development — in a noteworthy rebuke of the EV maker.

CATL has invested heavily in an alternative lithium-iron-phosphate (LFP) battery which contains no cobalt or nickel, thereby reducing its manufacturing costs. While these batteries have less energy density, and so don't power vehicles as far, they are safer and thus more acceptable to consumers and regulators.

Battery Type	Nickel/Cobalt Content	Energy Density (Volumetric)	Thermal Stability
Nickel Cobalt Aluminum (NCA)	Nickel 80% Cobalt 15%	600	Fair
Nickel Cobalt Manganese (NCM)	Nickel 60% Cobalt 20%	580	Fair
Lithium Iron Phosphate (LFP)	None	333	Very Good

How different lithium-ion battery chemistries compare in content and performance. *Data: Nickel Institute, Epec*

In the same month that Tesla was summoned by Chinese regulators, it [finalized](#) plans to install CATL's LFP batteries in its China-made vehicles. In July, Tesla CEO Elon Musk announced a "long-term shift" towards LFP batteries for the company's entry-level EVs, while it has also [extended](#) its partnership with CATL until 2025.

In more positive news for CATL, Volkswagen and GM have also revealed plans to use LFP batteries. Data from Roskill shows that demand for LFP batteries in the first half of 2021 soared more than fourfold compared to the same period the previous year.

BEYOND CARS

When it comes to batteries, much attention has been focused on the automotive sector. But industry analysts see another sector soon ballooning in importance as countries transition to renewable energy sources: energy storage. Because wind and solar energy produces electricity at times that don't always align with peak demand hours, utility providers need large batteries to store energy.

Here, too, CATL is positioning itself to dominate, albeit with a solution that may not be lithium-based.

"The amount of energy storage we're going to need will increase significantly, and lithium-ion batteries might not be the right solution," says Ilaria Mazzocco, a fellow specializing in China's climate and energy policy at the Center for Strategic and International Studies. With the world facing a [shortage](#) of lithium, Mazzocco says it may not be feasible to develop large-scale storage facilities with lithium-ion batteries.

Instead, CATL announced in July that it was developing a sodium-ion battery — a first among top-tier battery makers. Unlike lithium, sodium is both abundant and cheap, and has

the added benefit of superior performance at low temperatures, according to Roskill's Shang. One shortcoming is that sodium-ion batteries are less energy dense than lithium-ion ones. But that is a minor concern for utility companies, which face fewer spatial constraints than automakers trying to cram batteries into a car.

CATL announced at its [launch](#) event that it plans to have a supply chain in place by 2023. But the company is already making brisk sales in the energy storage sector, where its revenues [leapt](#) over 200 percent year-on-year to \$300 million in 2020.

The company whose CEO once fretted about what might come after the typhoon now has quite a tailwind at its back.



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● COVER STORY



Pole Position

BY EYCK FREYMANN

In public, Chinese diplomats and climate negotiators deny that they see any link between climate change and geopolitics. But there is a deeply cynical consensus within China's academic and policy communities that climate change creates geopolitical opportunities that China can exploit — and must exploit before its rivals do. Greenland was the proof of concept for this strategy. And it caught the U.S. flat-footed.

● THE BIG PICTURE



Transsion's Triumph

BY GARRETT O'BRIEN

A look at Transsion's monumental growth, unique marketing strategies and future growth potential.

● Q & A



Jörg Wuttke on China's Self-Destruction

BY ANDREW PEUPLE

The EU Chamber of Commerce in China president talks about China's self-inflicted problems; how he gets away with being so outspoken; and why he believes in China's comeback gene.



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