China-Free Batteries Made From Salt Are Finally Here

Sodium-ion batteries have almost none of the problems that lithium-ion ones do, and could be cheap enough to make fossil-fuel dependence a thing of the past

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U.S. startups are finally delivering something researchers have been working on for decades: a battery in which rare, hard-to-get elements are replaced with the same stuff found in ordinary table salt.

This tech has the potential to help every country on earth break its dependence on China for batteries, and the critical minerals that go into them.

Like any other battery, sodium-ion cells can store and release energy. They are initially being deployed where they're needed most, in America's power grid and fast-expanding crop of data centers. As in our homes, giving the grid or other infrastructure the ability to stockpile energy when it is cheap and plentiful, and discharge it when it is scarce, can increase reliability and lower the cost of electricity.

While grid battery storage is already growing in the U.S. at a furious pace, new sodium-based batteries are potentially cheaper, longer-lasting, safer and more reliable than conventional, lithium-based ones. They could accelerate the rollout of renewables, and be part of less-polluting alternatives to natural-gas turbines and diesel generators.

Most sodium-based batteries are now made in China, and represent less than 1% of all batteries delivered this year. In the U.S., a number of startups have begun producing small numbers of such batteries, and are racing to scale up production. One industrial giant GM is in the process of designing its own sodium-based batteries to tailor them to different applications before moving to mass production.

A recent report from Morgan Stanley projects that within a decade, more than a third of all batteries produced in the world will use sodium, not lithium.

Lessons from Tesla

The small group of entrepreneurs in pole position to bring sodium-ion batteries to the U.S. at scale includes a pair of former Tesla engineers teaming up to compete with their old boss.

Landon Mossburg is CEO of Peak Energy, a startup that has raised tens of millions of dollars to build a factory for its battery packs, while Kurt Kelty is a vice president at GM in charge of the company's battery-development efforts. GM has made a strategic investment in Peak Energy, and plans to design and manufacture custom sodium-ion batteries. Peak Energy, in turn, aims to assemble them into systems that can be attached to the ailing U.S. power grid.

A worker assembles a utility-scale pack of sodium-ion batteries at Peak Energy.
In July, Peak announced the planned selection of a 183,000-square-foot facility to house its "gigafactory" for battery packs in Sacramento, Calif. The plan is to begin production in early 2027, and to churn out 4 gigawatt hours of batteries a year—40 times the 100 megawatt hours a year that the company's current pilot facility in Burlingame, Calif., can produce.

The startup already has more than $1.1 billion in announced deals with customers including energy-storage companies Jupiter Power and Energy Vault, as well as RWE Americas, a subsidiary of German multinational energy company RWE.

In the U.S., the business of grid-scale energy storage in batteries is dominated by Tesla's Energy division. The unit, which uses conventional lithium-ion batteries, is the fastest-growing part of the company and creates systems designed for large-scale energy storage on power grids.

Mossburg says he wants to capture a big slice of the addressable market for the giant "Megapack" battery packs Tesla sells, by providing sodium-ion systems that are significantly cheaper, more reliable—and less likely to catch fire.

All lithium-ion batteries can catch fire—a process called "thermal runaway" that can affect battery packs on planes, in electric vehicles, or in grid storage-scale arrays. Such fires are rare, but they do happen; in 2025, such a fire sent flames into the skies above an array of Tesla Megapacks in Boulder City, Nev. Tesla, which didn't respond to requests for comment, has periodically held events to train firefighters to respond to battery fires.

Current lithium-ion battery packs for grid storage require liquid cooling systems to prevent fires. The requirement adds complexity, creates many more potential points of failure and lowers the amount of energy stored per square foot, Mossburg says.

Data-center edge

Sodium batteries' competitive edge for stationary storage applications such as data-center backup power systems (in place of diesel generators) and power grids (in place of natural-gas "peaker" plants) lies in part in their less-intensive cooling needs.

Cooling systems for lithium-ion packs drive about 90% of the operational cost of conventional grid-storage batteries, Mossburg says. The cost stems from the need to maintain the cooling systems, to fix them when they break—and to design fields of batteries so the damage is limited in the event of a catastrophic failure.

By contrast, Peak Energy's battery packs can be passively cooled by the air flowing around them. Sodium-ion batteries of the kind used by Peak Energy can still catch fire, but are far less likely to, Mossburg says.

Peak Energy's current factory can produce 100 megawatt hours a year; its next one could make 40 times that.
Peak Energy hasn't disclosed the initial cost of its battery packs, so it is hard to say how it will stack up against Tesla's Megapacks, which can cost more than $1 million per unit, or between $200 and $300 per kilowatt-hour of capacity. Kelty, of GM, says that until companies like his scale up domestic production of sodium-ion batteries, Chinese-made lithium-ion batteries will remain cheaper.

New designs ahead

Just across the San Francisco Bay from Peak Energy's Burlingame facility, San Leandro-based Inlyte Energy is working on a different kind of sodium-based battery. Inlyte uses four main ingredients, processed into chemicals that go into long, tube-shaped batteries. Its batteries rely on iron powder, steel, aluminum oxide and food-grade table salt.

The result, says founder and CEO Antonio Baclig, are battery cells that can't catch fire at all. In conventional battery packs, when one cell overheats and catches fire, it can cause all those around it to also catch fire. In Inlyte's packs, when one cell overheats, it never gets so hot that it threatens neighboring cells.

This means the cells can be packed much more tightly than competing technologies, and could potentially yield per-square-foot energy densities as good or better than the lithium-ion battery systems now in use for stationary power storage.

Next week, Inlyte plans to deliver its first battery pack to Southern Company, which operates regulated utilities in four states, at its Wilsonville, Ala., energy-storage facility.

For all of sodium-ion batteries' strengths, there is one arena where lithium-ion batteries are still tops, owing to unavoidable physical realities: the amount of energy they can store per gram. In vehicles where weight matters, such as EVs, this means the future still mostly belongs to lithium-ion batteries.

A new race with China

China dominates production of the materials that go into today's leading battery technologies that are based on lithium-ion chemistry, even though it was perfected in the U.S.

Without the right support from the U.S. and allied governments, the U.S. might again find itself having developed a novel energy technology, only to see China achieve a monopoly on its production, says Mukesh Chatter, CEO of Alsym Energy. Chatter's Massachusetts-based startup is developing components that will go into sodium-ion batteries manufactured by other companies.

Chinese battery giants BYD and CATL have announced plans for industrial-scale production of sodium-ion batteries. Beijing's capacity for long-term planning and investment gives China an advantage when trying to take nascent technologies from the prototype stage to the scale required to dominate global markets.

"We are not getting out-innovated," says Chatter. "But it will be a shame if we get out-scaled, again."