

To Cut Energy Bills, Companies Tap Battery Power

Big-box stores and others use energy-storage systems to reduce their peak consumption from the grid.

By Cassandra Sweet • Updated Sept. 13, 2016 11:03 p.m. ET



Cargill installed two megawatt-hours of Tesla Motors batteries at its Fresno beef-processing plant to help it save about \$100,000 a year on energy. *Photo: Cargill*

[J.C. Penney Co., Inc.](#) recently was able to cut the power bills of six of its Southern California stores.

The secret: batteries.

Penney's lithium-ion batteries, made by [Panasonic Corp.](#), charge by night in metal cases in the storage areas of each facility. Then, by day, when power from the grid costs more, they help run the stores' air-conditioning. The batteries also help the stores avoid high utility fees, called demand charges.

Companies of all kinds are turning to batteries to cut expenses and reduce demand for new power plants. Batteries and other such devices are finding their way into big-box stores, industrial plants and data-storage facilities in states like California, Hawaii and New York, which encourage energy storage as a way to reduce reliance on polluting power plants.

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The batteries used by Penney can provide about 35 kilowatts of power for roughly two hours, and are expected to save each store at least \$6,000 a year on its power bills. Penney plans to install batteries at three additional stores this year and 14 more next year. A software system tracks each store's real-time power usage and switches the batteries on and off. Stem Inc., which is installing the batteries and software, tracks the buildings' power use and storage systems to make sure they're working as designed.

“We've always been trying to reduce our energy consumption,” through measures such as installing energy-efficient lights, says Kyle Wilkes, energy and facilities maintenance director for Penney. “It's a wonderful technology for us, to shift that energy consumption to night, when we're going to have reduced demand costs and a low off-peak rate.”

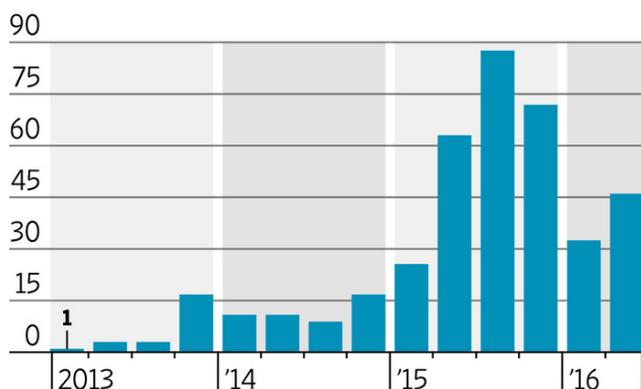
Across the U.S. last year, companies, universities and commercial property

owners installed more than 250 energy storage systems with total capacity of 64.1 megawatt-hours of power, up from just 48 systems and 12.2 megawatt-hours in 2014, according to GTM Research, a company that tracks clean-energy markets. This year, installations are on track to more than double, to 140 megawatt-hours.

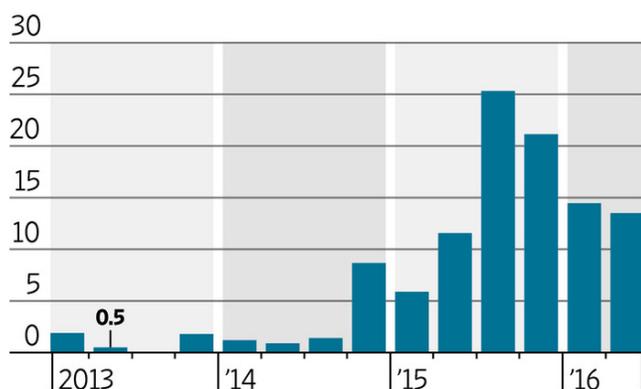
Power Shift

U.S. companies have started installing batteries to store electricity for later use

Number of U.S. commercial energy-storage installations, by quarter



Commercial energy-storage systems installed, in megawatt-hours of electricity, by quarter



Source: GTM Research/Wood Mackenzie
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The state of California is requiring big utilities to install or help coordinate installation of 1,325 megawatts of energy storage over the next five years to help balance an increasing flow of electricity from solar panels and wind turbines, whose production varies depending on conditions and time of day. California offers homeowners and commercial property owners rebates that can cover as much as 60% of the cost of a battery system.

Battery systems for commercial properties range from \$950 to \$1,500 a kilowatt-hour, or between \$19,000 and \$30,000 for a system that can discharge 20 kilowatts for one hour, or 10 kilowatts for two hours, according to GTM.

Cargill Inc. last year installed two megawatt-hours of batteries made by [Tesla Motors Inc.](#), to provide extra power at certain times of day at its beef-processing plant in Fresno, Calif. Cargill expects the batteries to help it save about \$100,000 a year on power expenses. Roughly 1,000 people process meat in two eight-hour shifts at the

plant, and a third shift does cleaning and maintenance overnight.

“Storage is helping us to optimize the time in which we pull energy from the grid,” says Eric Hoegger, the company’s director of power origination.

Some data-storage operators, which rely on a steady flow of electricity day and night, are looking particularly closely at new battery-storage technologies. [Microsoft Corp.](#) is testing flow batteries made with zinc bromide by Primus Power, and various lithium-ion batteries that Microsoft plans to incorporate as a design element in new data farms.

Traditional data centers tend to have diesel-fueled generators and lead-acid batteries to provide backup electricity in the event of power outages, which are rare. Microsoft wants a better battery that can run for hours in the event of an outage, but that can also provide electricity to the grid in the event that a local utility needs more power to stabilize the grid.

“The goal is to find the optimal technology that can replace hundreds of megawatts of batteries and create a more optimal solution for the grid,” says Brian Janous, Microsoft’s director of energy strategy. Microsoft is exploring plans to include next-generation batteries at new data-storage facilities in the U.S. but says it hasn’t chosen a supplier yet.

While batteries are gaining traction, they are still relatively expensive, which limits their usefulness.

“This is solar 10 years ago; it’s still relatively early,” says Nancy Pfund, managing partner of San Francisco-based venture-capital firm DBL Partners, which is backing Primus Power and other energy-storage companies.

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