

New ways to put energy in the bank

October 27 2015, by Ivan Penn, Los Angeles Times

Mike Hopkins sells an ice maker that stores energy. It's not sexy technology, he notes. But his Santa Barbara, Calif.-based business, Ice Energy, is growing fast.

Greg Smith touts a more space-age approach to energy storage at Sonnenbatterie in Los Angeles. His company makes a home unit with a sleek cabinet the size of a refrigerator. In an emergency, it can power a home for up to two weeks.

NEC Energy Solutions banks energy for the likes of Southern California Edison and other big utilities. The batteries are huge, about the size of a mobile home.

All three companies are pioneers on the energy storage frontier.

Big batteries cost a lot of money. But concerns about climate change and consumer demand for clean energy are creating more demand for energy storage solutions - especially to fully capture the possibilities of alternative energy.

Solar and wind energy do not provide consistent generation. The sun goes down at night. Clouds get in the way. The wind stops blowing.

At those times, utilities need backup power to even out the load. Meanwhile, homes and businesses want to store rooftop solar energy and use it later in the day or overnight.

"Storage provides a means to temporarily park excess energy, including renewables, when it's plentiful and cost-efficient and inject it back onto the [grid](#) later in the day when it's needed," said Anne Gonzalez, a spokeswoman for the California Independent System Operator, which oversees electricity distribution in the state.

The state is stepping in to boost market demand. The California Public Utilities Commission in October 2013 set a target for utilities to bring 1,325 megawatts - more than half the capacity of the closed San Onofre nuclear plant - of additional storage online by 2024.

As a result, "storage is going to move quickly," said Tim Derrick, general manager of advanced solutions for [renewable energy](#) giant SunEdison. "The old model of electricity generation is dying," he said. "Grid 1.0, that is dead. We're hastening the evolution of Grid 3.0."

Ice Energy is a part of Grid 3.0. In the last 10 months, the company tripled the business of the previous half-dozen years. Ice Energy's main product is the Ice Bear. On the outside it looks like any other metal box on the roof of some commercial building.

Inside the unit is an ice maker for which the water needs changing just once every 20 years. The [ice](#) is frozen at night, when commercial electricity rates are likely to be lower. When it gets hot the next day, the air conditioner's energy-hog compressor shuts down, and cold water from the Ice Bear is fed into the air-conditioning unit for cooling. The water then recycles back to the Ice Bear.

"It's those air-conditioning units that create spikes on the grid," said Hopkins, Ice Energy's chief executive.

Basically, the Ice Bear, known as a thermal storage unit, saves electricity during peak demand times, when electricity is most expensive. It doesn't

replace air conditioners but helps them operate more efficiently.

Sonnenbatterie is getting ready to sell another kind of energy storage system to U.S. homeowners. The German company recently established its U.S. headquarters in Los Angeles and is running a pilot with 50 of the units. The company is building a manufacturing facility in San Jose, Calif., and a research and development operation in Atlanta.

The battery system ranges in cost from \$10,000 to \$24,000 for the largest unit of 6 kilowatts, which Smith says can last up to two weeks to power a house in an emergency. The units are enclosed in cabinets that could fit in with the decor of most homes and be installed by any solar installation contractor.

The lithium-ion batteries store electricity from solar rooftop panels, available to run appliances when the sky goes dark.

Theoretically, pairing a solar system with such a battery (similar devices are being made by Elon Musk's Tesla operation) could allow a household to disconnect from the grid.

"We can really save people money who are connected to the grid," said Greg Smith, senior technical trainer for Sonnenbatterie. "Don't use energy from the grid."

No one expects the electricity grid to disappear any time soon. Big electricity producers are also keen on battery storage to help them balance the electricity load, especially as more solar and wind power come online.

NEC Energy Solutions of Westborough, Mass., completed a project this summer for Southern California Edison.

The 2.4-megawatt storage facility in Orange can supply 500 to 750 homes. It is the first energy storage system to support Edison's distribution grid. The bank of batteries sits in large containers that fill about half the size of a tennis court.

"Energy storage is becoming an ever more common part of today's electric grid, and our installation and commissioning process enables [energy storage](#) to be delivered just like any other piece of utility equipment," Bud Collins, chief executive of NEC Energy Solutions, said in announcing the Edison project.

David Song, an Edison spokesman, said the battery system isn't meant specifically to accommodate renewable [energy](#). "The primary purpose of it is for reliability," he said.

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Citation: New ways to put energy in the bank (2015, October 27) retrieved 26 June 2024 from <https://phys.org/news/2015-10-ways-energy-bank.html>

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