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## A Vanadium Flow Battery Brings Energy Storage to New York City's MTA



Germany's CellCube to keep MTA running in storms, balance Con Ed's grid day by day

Jeff St. John  
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After California, New York is the next big U.S. market for grid-scale energy storage, and much of that potential is packed into the 469 square miles of New York City. That urban grid is going to require its energy storage systems to shave peak load at buildings, help balance the grid at times of stress and congestion, and importantly, back up critical facilities in the event of another storm like 2012's Superstorm Sandy.

On Wednesday, New York City's Metropolitan Transit Authority (MTA), which suffered its own Sandy-related shutdown, announced one of the city's biggest energy storage projects to date: a 400 kilowatt-hour array of CellCube vanadium redox flow batteries at its new facility at 2 Broadway in downtown Manhattan.

The demonstration project features the first U.S. installation for the CellCube, built by Germany's Gildemeister and brokered by Canadian partner American Vanadium. Partners including the New York State Research and Development Authority (NYSERDA) and utility Consolidated Edison are also involved, looking to test how multi-hour, modular storage systems like the CellCube can serve multiple tasks for the MTA and for the grid at large.

"The prime [question] is how these batteries can help customers make money by flattening their peak load curves," Bill Radvak, CEO of American Vanadium, said in an interview this week. "Demand charge mitigation," the term used to describe this business case for building-side energy storage, is the rationale of energy storage companies like Stem, Green Charge Networks, Coda Energy and SolarCity in their commercial projects to date.

Those projects have so far used lithium-ion batteries, which are more suitable for shorter-duration energy storage applications. The CellCube, by contrast, is a flow battery, meaning that it pumps electrolyte through stacks of electrochemical cells.



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That makes flow batteries one of the few currently cost-effective options for storing energy for multiple hours in a row, although emerging technologies like Eos' zinc-based batteries, Aquion's sodium-aqueous batteries or Ambri's liquid-metal batteries are striving to meet that task.

"The second [issue] that Con Ed is looking at here is...how energy storage can be used to help save other customers energy," he said. Con Ed is spending billions of dollars to renovate New York City's grid, which is facing congestion and challenges delivering electricity during times of peak power demand.

"One way to avoid a lot of these upgrades is to change the way energy is delivered," he said, especially as distributed energy resources like solar PV, combined heat and power, and other on-site generation resources start coming on-line. The MTA project is also linking up to an automated demand response demonstration being led by Lawrence Berkley National Laboratory, which is meant to help balance the 1.6-million-square-foot office building's daily energy consumption against the grid's daily needs.

The third use case, Radvak said, is "looking at energy storage and its ability to help with grid resilience, in the next superstorm, the next disaster, and how these can help run critical infrastructure." New York has multiple microgrid projects underway to provide emergency backup power for critical infrastructure like hospitals and transportation systems, and Governor Andrew Cuomo has announced plans to direct \$40 million into microgrid projects around the state.

Gildemeister, a century-old industrial machine tools maker, holds a majority stake in Cellstrom, the Austrian-based maker of the CellCube system. Gildemeister, which has a strategic partnership with Japan's DMG Mori Seiki and took that company's name as its own last year, has reportedly sold more than 60 of its CellCube devices in Europe and Asia, up from 50 deployments as of mid-2013. It has a project with German utility E.ON, and is working with partner Younicos to create "battery parks" across Europe.

Canadian mining company American Vanadium has been Gildemeister's North American distribution partner since May 2013, and this is its first publicly announced project. In February, it delivered the first CellCube units for testing to the Department of Energy's National Renewable Energy Laboratory in Golden, Colorado, with the aim of testing it as a multi-hour energy storage resource to help balance wind and solar power.

New York is expected to announce an energy storage incentive program, along the lines of California's Self-Generation Incentive Program, in order to help utility customers with the still-expensive prospect of backing up their electricity with batteries. At the same time, utilities like Con Ed and the Long Island Power Authority are working with state grid operators and regulators to commission storage projects as part of a plan to reduce hundreds of megawatts of load as a means of addressing the looming closure of the Indian Point nuclear power plant.

**TAGS:** [aquion](#), [cellcube](#), [coda energy](#), [consolidated edison](#), [energy storage](#), [enervault](#), [eos energy](#), [flow battery](#), [gildemeister](#), [green charge networks](#), [lithium-ion](#), [microgrid](#), [new york](#), [nyserda](#), [primus power](#)



### Jeff St. John

Reporter covering the green technology space, with a particular focus on smart grid, demand response, energy storage, renewable energy and technology to integrate distributed, intermittent green energy into

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