

How Good Distribution System Planning and Modernization Pay Off

Reducing Cost to Ratepayers:

Vermont's Green Mountain Power Virtual Power Plant (VPP) integrates distributed energy storage with advanced distribution grid management.¹ Over 2,500 customers lease or buy Tesla Powerwalls, storing power when prices or demand are low and using or selling it when high. With 50 MW capacity, the program saves about \$3 million annually, benefiting all 275,000 ratepayers. Its distributed design improves reliability in a tree-heavy state prone to outages, and helps balance renewable energy variability. Reduced reliance on fossil-fuel peaker plants contributes to Green Mountain getting 78% of its electricity from renewables and being 100% carbon-free annually.

Avoiding or Deferring Costly Infrastructure Investments

The Brooklyn-Queens Demand Management (BQDM) program,² launched by Con Edison in 2014, used non-wires alternatives (NWAs) to defer a \$1 billion substation. It reduced peak demand to achieve 52 MW of load relief by 2018. Customer-side measures – energy efficiency, demand management, and distributed generation – provided 41 MW. Utility-side solutions, including voltage optimization and battery storage, added 11 MW. This deferred substation construction until 2026, with significant savings to ratepayers.

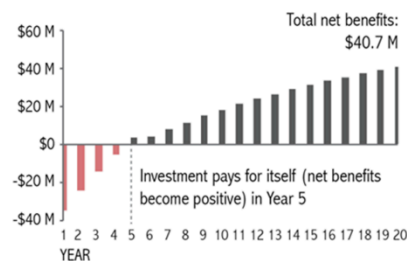
Investing in modernization instead of traditional infrastructure

With catalytic grant support from New York's State Energy Research and Development Authority (SERDA) program, Central Hudson Gas and Electric invested in a grid modernization program³ that included:

- automated transmission and distribution management systems;
- superconducting fault current limiters, which prevent problems associated with faults in power lines by detecting and rerouting power flow around the fault; and,
- sensors, smart inverters and other monitoring and power controls to aid the efficient integration of renewable energy resources into the grid.

The program is projected over 20 years to produce net economic cost savings of \$40.7 million, reliability benefits of \$7.3 million, and environmental benefits of \$28.0 million. At the projected rate of savings, the program's net economic benefits exceeded costs by year 5.

Economic Benefits of Central Hudson's and NYSERDA's Investments in Distribution Automation



¹ Green Mountain Power, *GMP's Energy Storage Programs Deliver \$3 Million In Savings for All Customers During 2020 Energy Peaks*; 29 September 2020.

<https://greenmountainpower.com/news/gmps-energy-storage-programs-deliver-3-million-in-savings/>

² Utility Dive, *BQDM program demonstrates benefits of non-traditional utility investments*; March 11, 2019

<https://www.utilitydive.com/news/bqdm-program-demonstrates-benefits-of-non-traditional-utility-investments/550110/>

³ NYSERDA Smart Grid Evaluation Case Study: *Central Hudson's Grid Modernization Investments*; 8 July 2020

<file:///C:/Users/Alfre/Downloads/NYSERDA-GridModernization-CentralHudson-EvaluationCaseStudyReport-July2020.pdf>