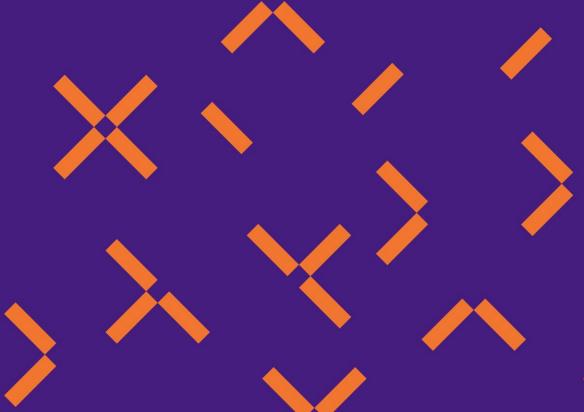


Transforming New York's Electricity System with the Marcus Garvey Village Microgrid

Philip Martin

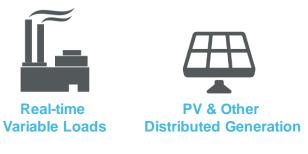
DER Business Development Enel X North America



Flexibility Solutions mission: Connect any asset to any market anywhere in the world

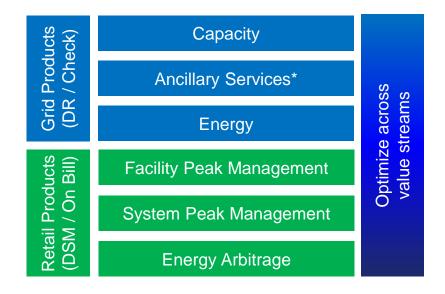


Connect all types of distributed energy assets...





... and optimize across all available grid and retail products



... using a flexible and scalable global technology platform



DER Management System

Virtual Power Plant Optimization

Cloud Based Architecture

Brooklyn Queens Demand Management Program

enelx

- Substation upgrade deferral = \$ 1.2B
- PSC approved \$200M Non-Wire Solutions (NWS)
- Program cost allowed in rate base
- Reverse auction drove market-based response > \$1,992/kW; 2-year program
- Drives better distribution system utilization
- Framework for future market-based Non-Wire Solutions



Marcus Garvey Apartments Revitalization



2013 2017





Marcus Garvey Microgrid System





300 kW / 1.2 MWh Battery Storage System





400kW Distributed PV Power



Bloomenergy*

400 kW Energy Server Fuel Cell



Benefit Share: Applicable Revenue Streams



 Optimized load management from the combined Solar + Fuel Cell + Building Load + Battery Operations.

Utility NWS and DR



- BQDM dispatched when the DA forecast is projected to 93% of the summer forecasted peak
- Also participates in ConEdison DLRP program

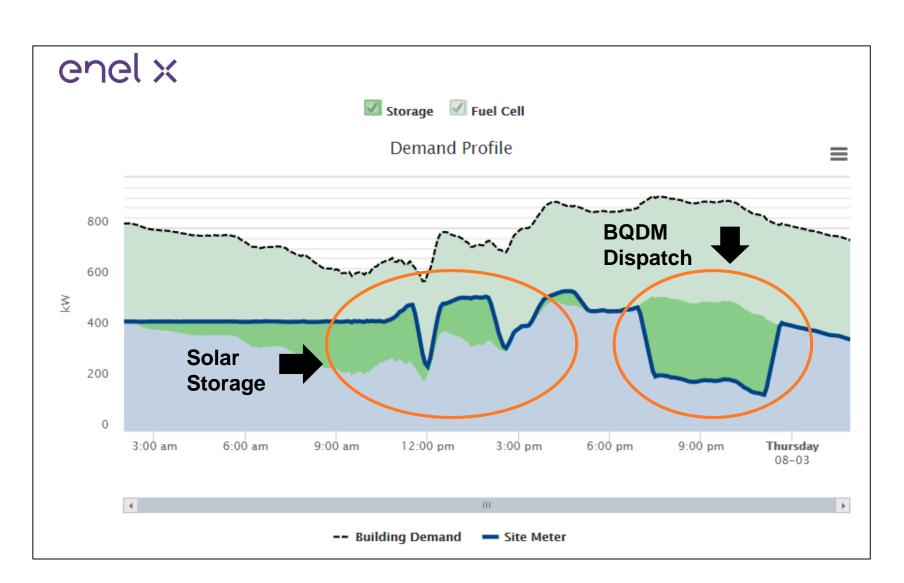
NYISO Participation

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- Spot-exposed to be able to optimize economics from DA hourly-pricing
- NYISO winter DR (SCR-ICAP)

BQDM Test Verification





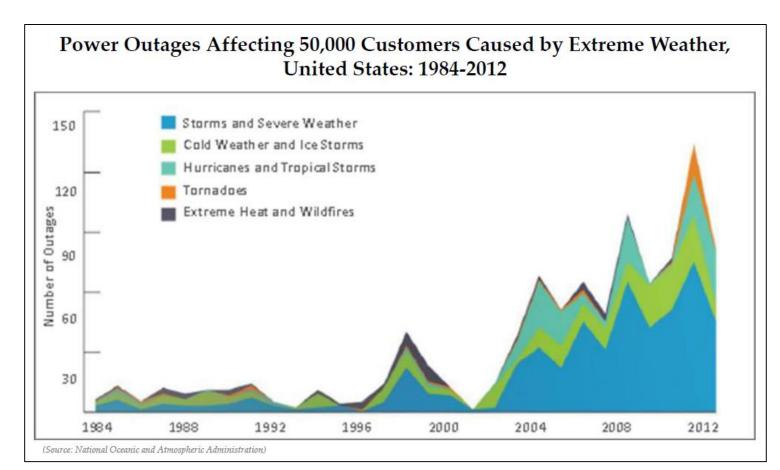
Key Driver: Weather-Driven Outages



Microgrid: Resiliency

- Provides backup power for the management and security office
- Community room power for extended outages





Conclusion



- Moving beyond "cost recovery" via performance-based rate design, like in NY, will further the development of Non-Wire Solutions and increasingly give utilities a new tool in grid management.
- Application stacking remains key to developing successful DER business cases, including for microgrids.
- "Energy as a Service" model enables end-users to enjoy the benefits of microgrids without upfront capital
 or needing to be an energy expert.
- Resiliency will be an ongoing need and driver for projects as extreme weather events increase.

Enel X offers tailored solutions to meet the most pressing energy-related challenges for business, cities, homes and transportation



E-INDUSTRIES

- Advisory and Consulting services
- Energy Intelligence Systems
- Energy Efficiency Solutions
- Distributed Generation and off-grid Solutions
- Demand Response
- Demand Side Management
- RES direct marketing

E-CITY

- Smart Public Lighting
- Artistic Lighting
- Energy Efficiency Solutions
- Smart Signaling
- Smart Security
- Optic Fiber

E-HOME

- Smart Home solutions
- Energy Monitoring
- Home Electric appliances
- Lighting B2C
- Energy Management
- Consumer Platforms
- Health and Well-being

E-MOBILITY

- E-vehicle
- Recharge services
- Recharge infrastructures
- Vehicle-to-grid
- Integrated mobility
- Second life battery services



Thank you

Philip Martin

DER Business Development Enel X North America

