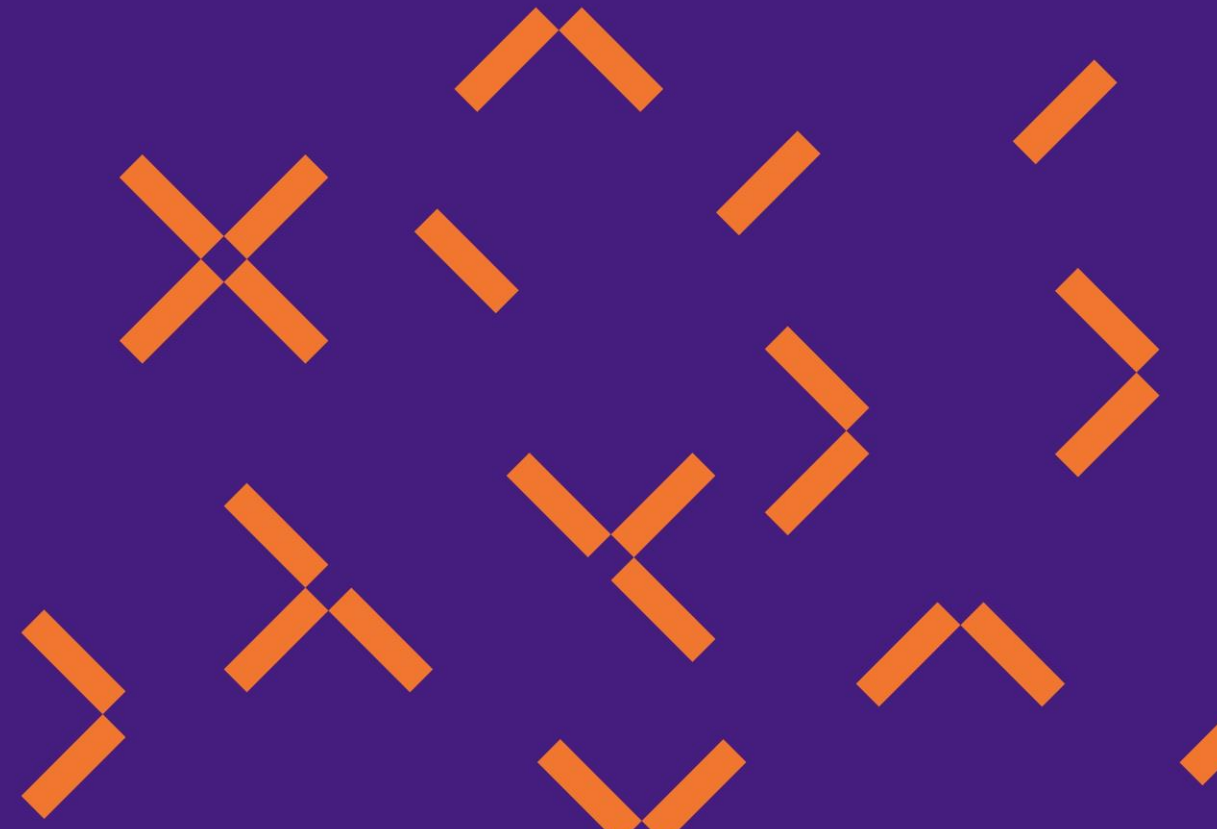




# Transforming New York's Electricity System with the Marcus Garvey Village Microgrid

**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...



Real-time  
Variable Loads



PV & Other  
Distributed Generation



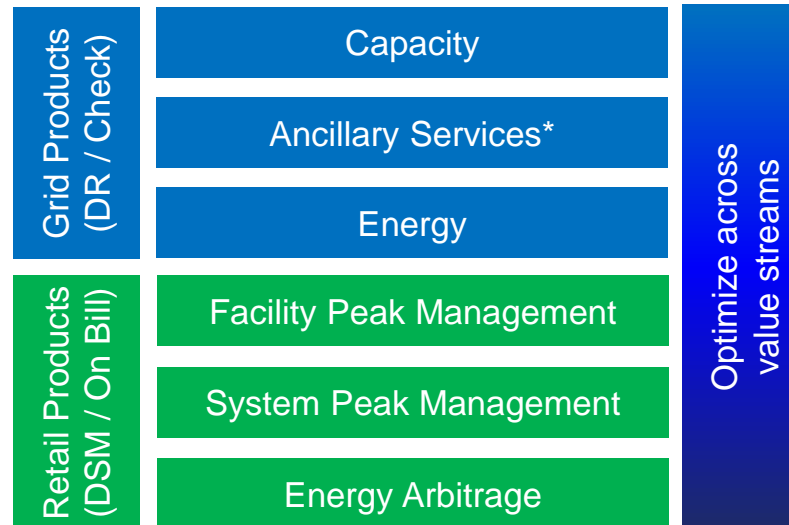
Energy Storage



EV Charging

DER Management System

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



Virtual Power Plant Optimization

... using a flexible and scalable global technology platform

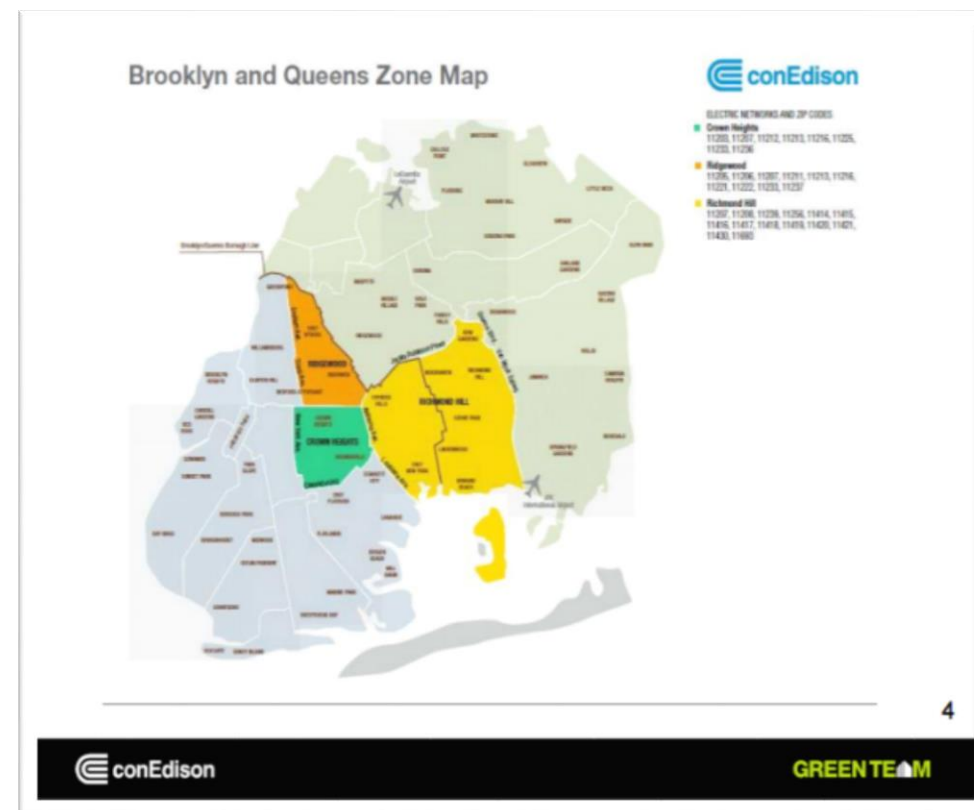


Cloud Based Architecture

# Brooklyn Queens Demand Management Program



- 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



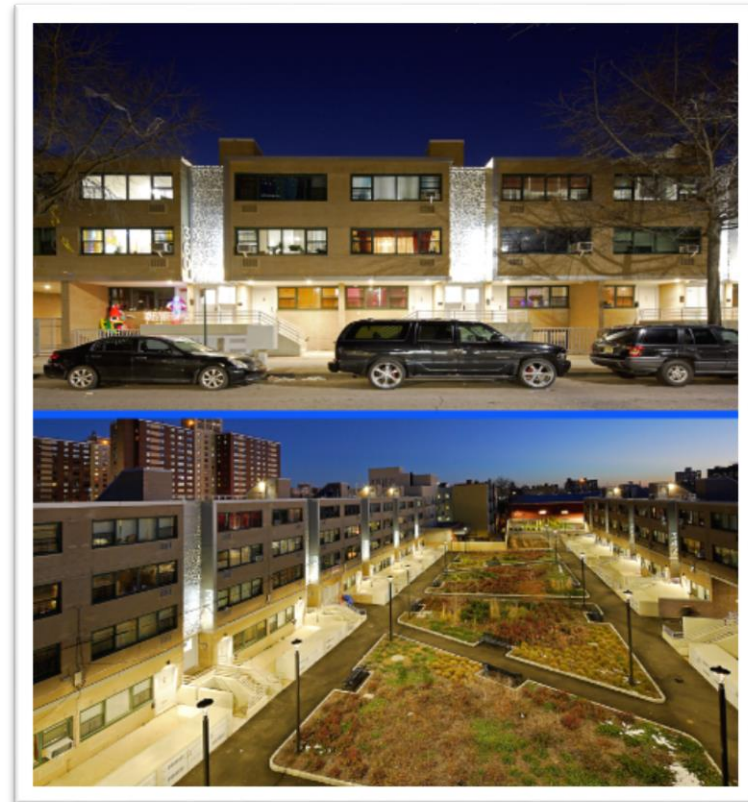
# Marcus Garvey Apartments Revitalization



2013



2017



# Marcus Garvey Microgrid System



300 kW / 1.2 MWh Battery Storage System



400kW Distributed PV Power



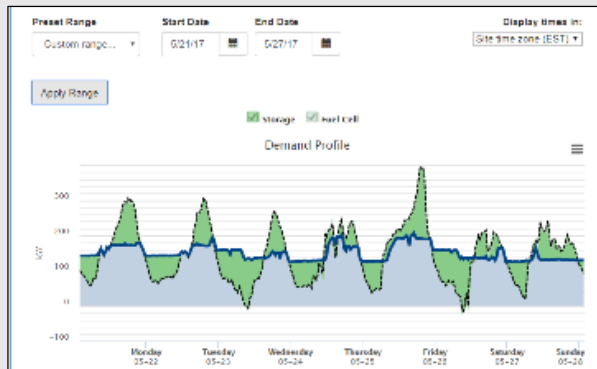
400 kW Energy Server Fuel Cell



# Benefit Share: Applicable Revenue Streams

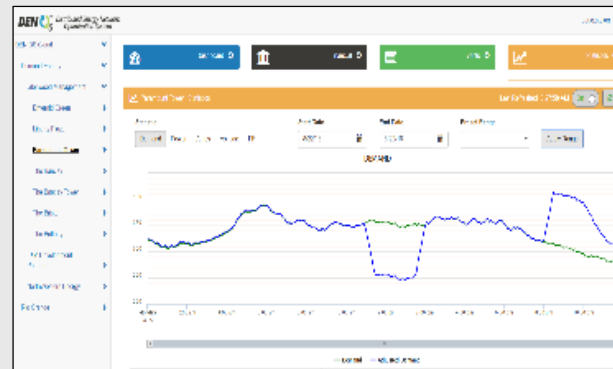


## Demand Charge Management



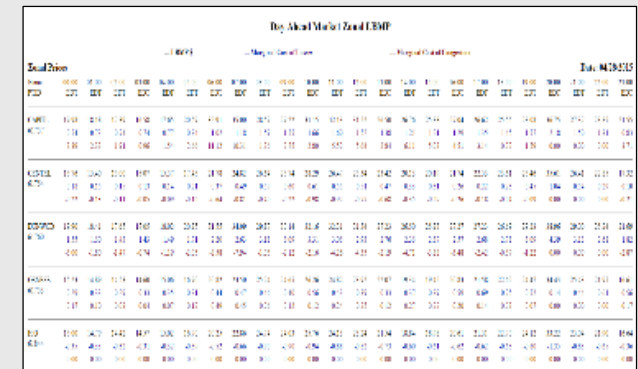
- Optimized load management from the combined Solar + Fuel Cell + Building Load + Battery Operations.

## 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

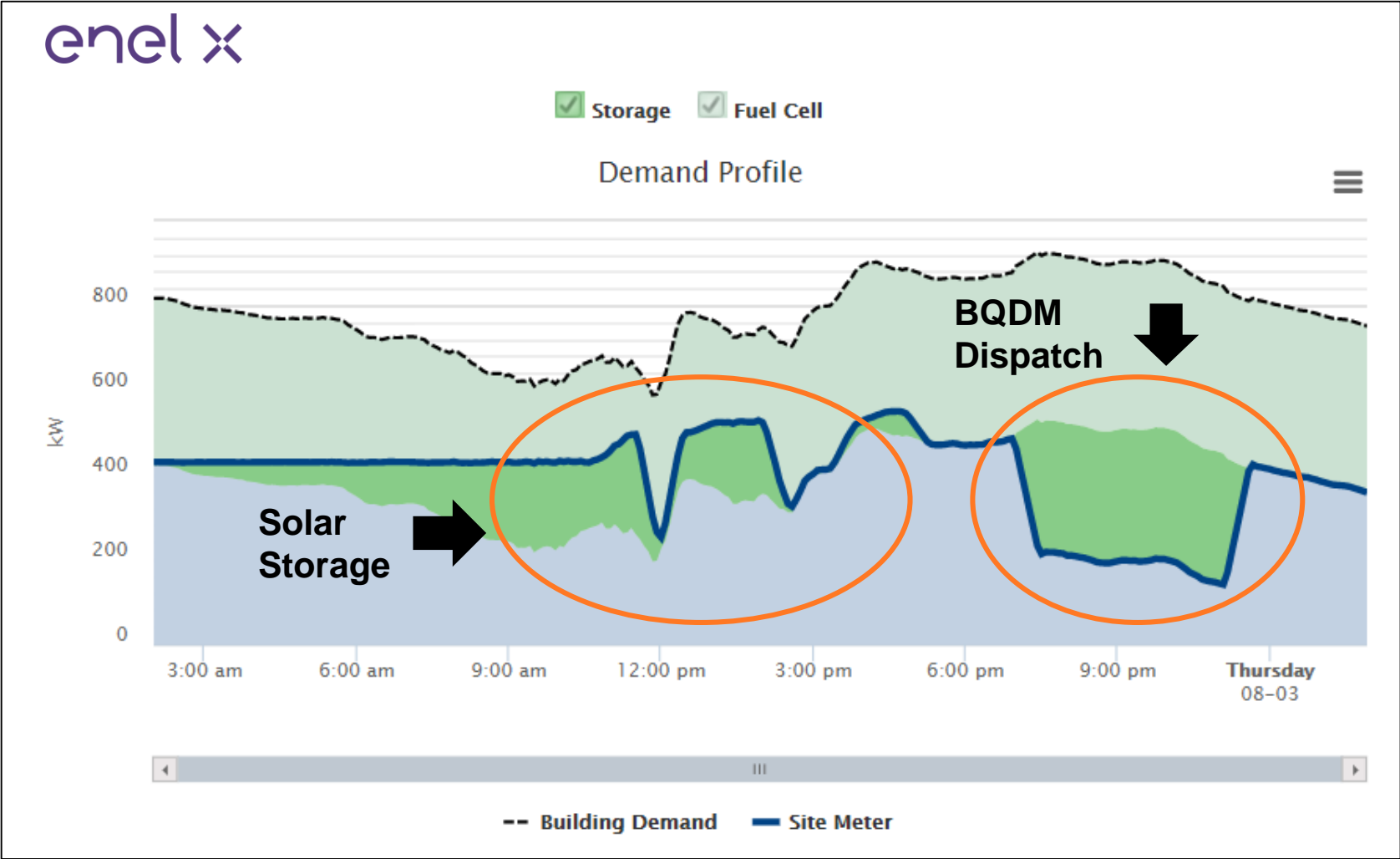
## NYISO Participation



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

Wholesale/Retail Value Stacking

# BQDM Test Verification





# Key Driver: Weather-Driven Outages

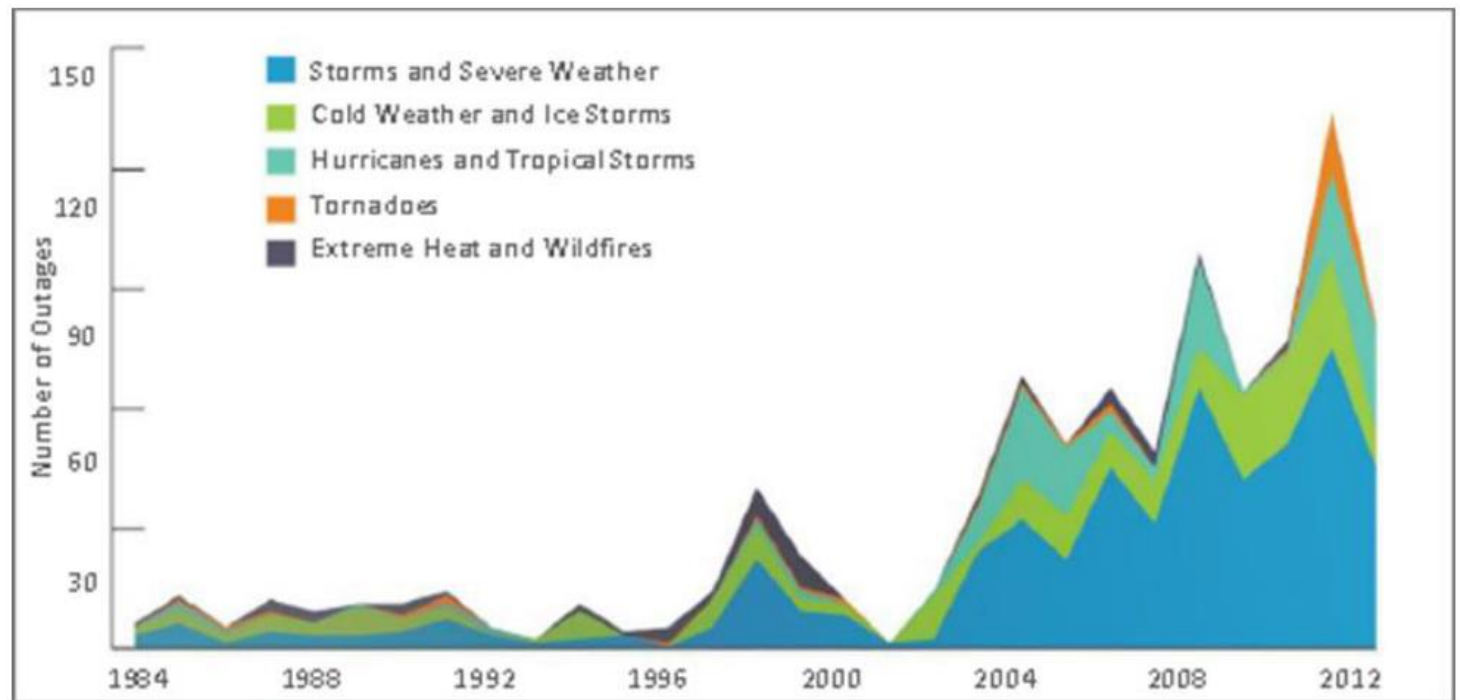


## Microgrid: Resiliency

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



Power Outages Affecting 50,000 Customers Caused by Extreme Weather, United States: 1984-2012



(Source: National Oceanic and Atmospheric Administration)



# 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

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