New Paltz Microgrid Project
Stage I Feasibility Assessment – Public Meeting
Dec. 15, 2015 – 6:00 p.m.
New Paltz Village Hall
Meeting agenda

- Introductions
- Background on microgrids, NYSERDA NY Prize competition
- New Paltz community objectives and Microgrid strategies
- Proposed New Paltz Microgrid system, facilities, and assets
- NY Prize timeline
Introductions

John Love, Senior Project Manager

NEW PALTZ TEAM
Town of New Paltz
- Neil Bettez, Supervisor-elect
Village of New Paltz
- Tim Rogers, Mayor
SUNY at New Paltz
- Brian Pine, Energy Management Coordinator
New Paltz
Central School District
- Richard Linden, Assistant Superintendent
New York State Dept. of Environmental Conservation
- Martin Brand, Regional Director

Central Hudson Gas & Electric
- Steve Burger, Sr. Project Director

PRIME CONTRACTOR
Microgrid Institute
- Michael Burr, Principal Investigator, PMO
- Peter Douglass, Project Management Associate
- Michael Zimmer, Legal and Regulatory

TECHNICAL PARTNERS
Hitachi Consulting
- John Westerman, Steve Pullins, Senior Engineers
- Brian Levite, Anna Fargo
Energy Management Consultants
Green Energy Corp.
- Paul Gregory, John Camilleri
Control System Engineers
TeMIX Inc.
- Ed Cazalet, Transactive Energy Consultant
Technical team

- Prime Contractor, project manager, principal investigator
  Microgrid design, development, feasibility assessment

- Technical Partner
  Microgrid control framework, data analysis

- Technical Partner – Microgrid design, modeling; energy efficiency
  assessment and technology

- Technical Partner
  Transactive energy, micro-market systems
A microgrid is a small energy system capable of balancing captive supply and demand resources to maintain stable service within a defined boundary.

A community microgrid provides resilient and stable energy supplies for vital community facilities and assets.
Microgrid systems help communities to achieve local resilience for vital services and interdependent community assets:

- Hospitals, police, fire, emergency
- Lighting, street lights, traffic lights
- Pumping, refrigeration, HVAC
- City water and wastewater
- Cell towers, telecom, Internet
- Gas stations, grocery stores, pharmacies

Modern, resilient infrastructure supports public safety, convenience, and economic growth
Why a microgrid?

The centralized utility grid can’t ensure local resilience
- U.S. utility grids are highly reliable, but not resilient
- Centralized utility systems and above-ground distribution lines expose customers to regional and local outages

Microgrids offer a platform for innovation and “prosumer” participation
- Rapidly advancing technologies improve the full suite of technologies that make microgrids work – from PV to software controls
- A community microgrid will optimize local energy investments to achieve multiple goals
NY Prize Community Grid Competition

Stage I: Feasibility study effort to determine the potential for a community microgrid

• The goal is to conduct an honest assessment using the available information and data in order to assess what is feasible and actionable
• This is not a stage 2 design proposal - it is a study to identify good projects and partnerships that are a natural fit in your community
• This study will assess the community’s needs, available/required technologies, and opportunities to develop community partnerships
• At the end of the study, there should be a solid understanding of the project and the general timeline, costs, and structure
• Information will be required from community members to assess:
  ▪ the community’s needs
  ▪ the community’s electric/thermal systems and equipment and demand energy resources (e.g. distributed generation, energy efficiency, smart grid);
  ▪ opportunities to develop strong stakeholder partnerships
The feasibility study will address a multitude of questions and engage a number of community stakeholders.

Feasibility Study Journey:

- Engage Stakeholders
- Kick-off Meeting
- Preliminary Technical Design
- Commercial, Financial, Legal Viability
- Benefit Cost Analysis
- Microgrid Design

- What are commercial terms/relationships between microgrid participants?
- What are microgrid capabilities?
- What is the preliminary technical design?
- Engage key project stakeholders including beneficiaries, generators, vendors, and project team.

NEW YORK STATE OF OPPORTUNITY | NY Prize
New Paltz Community Objectives

1) Ensure highly resilient energy supplies for facilities and services that are critical to health, safety, and economic vitality
2) Increase the community’s energy efficiency and decrease its environmental footprint
3) Expand and optimize the use of local clean energy resources – most notably, solar and biomass
4) Modernize local grid infrastructure and establish a platform for development and operation of innovative and competitive energy assets and resources
Ensure investments support resiliency
- Smart planning to maximize investment value for the community

Reduce dependence on fossil fuels
- Exploit renewables and shrink carbon footprint

Save money and support economic development
- Provide options for saving energy and saving money
- Modernize local grid
- Keep energy dollars in the community

Prosumer Platform
- Microgrid system facilitates customer participation in clean energy market
The microgrid’s three-tiered energy services model will provide a range of options for all New Paltz customers, ensuring that to the greatest extent possible, resources invested in distributed energy assets will be planned and deployed in ways that optimize their value to the community, including serving critical resiliency needs.
New Paltz Microgrid
Tier 1 Resiliency Facilities

- Decentralized microgrid architecture enables resilient energy for multiple critical facilities
- 10 microgrid “nodes” (facilities or clusters), managed as a portfolio for economic benefits
- Each node to isolate separately during outage
- Opportunities for customer and third-party investments in resilient energy assets

<table>
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<th>Node</th>
<th>CHP</th>
<th>PV Inverters</th>
<th>Battery Energy Storage</th>
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<tr>
<td>Total</td>
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</table>

Total system capacity: 4,186 kW
Proposed Energy Sources
Diverse resources for resilience, economics and environmental benefits

1) Efficiency, and Conservation Measures
- Building load control
  - Enable microgrid energy balancing
  - Demand response for grid support
- Energy efficiency measures (EEM)
  - Reduce total energy costs and emissions
  - Reduce coincident peak power loads and resource requirements

2) New Distributed Generation & Storage
- Solar photovoltaics (PV)
  - Renewable, zero-emissions energy
  - Stable power costs
  - Building-dedicated and shared resources (e.g., solar gardens)
- Energy storage Systems (ESS)
  - Enable rapid grid isolation and synchronization
  - Utility grid ancillary services
- Combined heat and power (CHP)
  - Fuel savings, energy conservation
  - On-demand baseload power

3) Existing Energy Systems
- Rooftop PV etc.
  - Modified to provide resilient energy supplies
- Utility grid
  - 15-20% energy supply
- Backup generators
  - Extra redundancy for critical facilities
Proposed Energy Sources
Solar photovoltaics and battery energy storage

- Multiple configurations for various site conditions and requirements
- Systems “right-sized” to achieve maximum efficiency and economic value
- Volume purchasing for declining incremental costs

- Ballasted Roof-mount Installation
- Ground-mount Installation
- Covered Parking Installation (Solar Trees)
- 25 kW / 75 kWh pad mount system
- 25 kW / 50 kWh pad mount system with storage in underground vault
- Multiple 5 kW / 12 kWh systems
Combined heat and power (CHP), also known as “cogeneration,” conserves energy by capturing waste heat and making it useful.
- Reduces fuel used and emissions produced by ~50% or more.
- Units “right-sized” to maximize efficiency and asset utilization.
- On-demand CHP complements PV for resilient microgrid operation.

Combined heat and power (CHP) captures waste heat to conserve energy, fuel, and emissions.
The progressive investment strategy begins by creating platform for development, followed by strategic investments to support resilience and other benefits.
Proposed business model

Public-private partnership (P3)

Owners:
- Public entities in New Paltz
- Private development consortium
- Third-party investors.

Benefits of P3 structure:
- Ensures focus on achieving community goals
- Provides access to a wide range of financing sources
- Lower total costs for customers

Energy services model:
The New Paltz Microgrid will provide resilience and other energy services for the community through the P3 enterprise
NY Prize timeline

Stage I – Microgrid feasibility analysis (July 2015-March 2016)

• Assess Microgrid Capabilities
• Assess Preliminary Design, Costing and Configuration
• Assess Commercial & Financial Feasibility
• Benefit Cost Analysis
• Develop Final Report

Stage II – Audit-grade engineering and financial analysis (April 2016-December 2017)

Stage III – Microgrid deployment (April 2018-Sept. 2019)
Contact us

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