Making the Microgrid-Utility Relationship Work
GI Energy: IDEA Microgrid Knowledge 2017
Today’s Topics

- Microgrid Backdrop: “Utility Always Wins”
- Lest We Forget Our History
- The Utility-Microgrid Nexus in 21st Century
- Case Studies
- Discussion & Questions
“The utility always wins.”
(But so can communities & developers.)
Lest We Forget Our History

1963
Rochdale Village

1973
Amalgamated Warbsse Houses

1970
North Shore Towers and Country Club

1964
New Jersey Center of Excellence at Bridgewater
21st Century Microgrids Are Supposed to Be Utility Enhancers

Infrastructure? Suprastructure? Mesostructure?

Staying within the Billing Envelope
Build a whole new grid layer?
But keep existing grid?
And reduce overall costs?

Heroic Vs. Business As Usual

Crashing Across Utility Silos
“Utility of the Future”
Distributed Generation
Metering
IT/Security
Rate Engineering
Interconnection

Software-Driven? Hardware-Driven? Human-Driven?
Make Use of Institutional Knowledge
<table>
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<tr>
<th>Case Studies</th>
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<tr>
<td>Parkville Microgrid, Hartford, CT (Eversource)</td>
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<td>Hunters Point, San Francisco, CA (SFPUC)</td>
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<td>Empire State Building, New York, NY (Con Edison)</td>
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<td>Battery REV Demo, New York, NY (Con Edison)</td>
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First microgrid Project in CT

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<tr>
<th>Size</th>
<th>800 kW grid parallel / 600 kW microgrid-mode</th>
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<tr>
<td>Power Generation Technology</td>
<td>Bloom Energy Servers (4 ESS fuel cells x 200 kW) + 1 Uninterruptable Power Module (UPM)</td>
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<td>Microgrid Equipment</td>
<td>Switchgear and Cabling</td>
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<tr>
<td>Microgrid Owner</td>
<td>Eversource</td>
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<tr>
<td>Bloom Server Owner</td>
<td>Bloom Energy</td>
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<tr>
<td>Design &amp; Development</td>
<td>Constellation / GI Energy / Van Zelm Engineers</td>
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<td>Utilities</td>
<td>Eversource / Connecticut Natural Gas</td>
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<tr>
<td>Interconnection</td>
<td>Parallel grid Connection + Critical Load (microgrid mode)</td>
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<tr>
<td>Customers</td>
<td>Parkville Elementary School, Senior Center, Library – Dwight Branch, C-Town Supermarket</td>
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San Francisco Shipyard Redevelopment & ‘Eco-Grid’

- 8,000,000+ square feet of new development
- New Master Utility Plan designed along with street grid and development blocks
- Third party funded systems: Solar PV & energy storage, geo-exchange HVAC, recycled water, automated waste collection, EV charging and self-sustaining street lights
- Mix of direct-use third party offtake contracts, and partnerships with local municipal utilities
San Francisco Shipyard ‘Eco-Grid’ – Details

- Over 800 acres for residential, commercial & municipal use
- Master planned site under single real estate developer, with GIE as eco-district development partner
- ~450,000 GPD water recycling system
- 10-15MW of rooftop PV planned
- 15,000 ton capacity geothermal heating & cooling system
Empire State Building – New York, NY (Con Edison)
Any questions?

What have your microgrid experiences been with utilities?

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