Using Generators and Batteries as Non-Wires Alternatives

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Outline

• Traditional Model

• What is Non-Wires Alternatives

• Benefits

• Case Study #1: Philadelphia

• Case Study #2: New York
Traditional Model

• More Power = More Wires

• Build around Peak Demand

• Utilities given “rate of return” for assets such as substations, wires, and poles

• Customer construction discounted based on projected usage
Traditional Model

Advantages
• “Utility Grade Power”
• Reliability (Area Dependent)
• Constant Usage = Lower Cost

Disadvantages
• Timing
• High Cost for Short Duration Usage
• Disruption / Traffic
Alternative Models – Non Wire Alternatives

Small Scale

Large Scale
### Alternative Models – Non Wire Alternatives

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<tr>
<th>State</th>
<th>Description</th>
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| **California** | The California Public Utilities Commission (CPUC) has approved a number of NWA-related actions, including:  
  - Providing guidance to the state’s investor-owned utilities (IOUs) regarding development of distribution resource plans (DRPs) that “identify optimal locations for the deployment of distributed resources.”  
  - Approving a pilot regulatory incentive mechanism that awards a 3-4% pre-tax incentive to utilities deploying cost-effective DERs that defer or displace traditional distribution investments.  
  - Directing California IOUs to procure at least 150 MW of “preferred resources,” such as EE, solar PV, or energy storage resources. |
| **New York** | In 2014, New York launched a set of regulatory proceedings and policy initiatives known as Reforming the Energy Vision (REV). One of REV’s key goals is to incentivize utilities to leverage the deployment of DERs to address problems traditionally handled by new investments in centralized generation, transmission, and distribution infrastructure. |
| **Rhode Island** | In 2006, Rhode Island enacted a requirement for utilities to file annual System Reliability Procurement reports. As part of this process, utilities have to consider NWAs. The state’s major distribution utility is also allowed to recover costs of investments in system reliability. |
| **Vermont** | The Vermont Public Utility Commission enacted legislation in 2015 requiring the Vermont System Planning Committee to identify deferral projects when considering new transmission. |
| **Maine** | The state’s Smart Grid Policy Act Directive requires regulators to consider NWAs before approving T&D projects. As of 2016, Maine has also designated a non-transmission alternative (NTA) coordinator to establish an independent investigator responsible for identifying cost-effective projects. |

CASE STUDY #1
CASE STUDY #1 – Philadelphia Navy Yard

• 1200 Acres

• 150+ Electro-Mechanical Power Meters

• Construction by Peak Demand

• Pharmaceutical, Shipbuilding, Government, Commercial
CASE STUDY #1

• Smart Meters
  – Provide interval data
  – Allow Trending & planning based on application

• Stepping Stone to Cost Effective Efficiency Measures
CASE STUDY #1

- Constrained Substation
  - Approximately 4 Miles from Utility Substation

- Peaking Profile

![2017-2018 SS 93 Load Duration Curve](image)
CASE STUDY #1 – Test Case

• Substation Load: 17.5 MW Peak
• Substation Capacity: 20MW
• Substation N-1 Rating: 15MW
• Request: 10MW in <3 years
• Timeline for Utility Power: 4-5 Years
• Estimated Cost: ~$45,000,000
CASE STUDY #1 – Test Case

- Smart Meters Utilized to Model System
- Alternative Option Developed of an 8MW Natural Gas Generation plant
- Capable of fully islanding
- Delivered on Time
- Final Cost: ~$15,000,000
Case Study #1 – Philadelphia Navy Yard

- PJM Market Revenue
- Resiliency
  - Multi Feeder Outage from Utility for several days
  - Little to no impact to tenants
Case Study #1 – Philadelphia Navy Yard

• Next Steps
  - RFP Issued in 2017 for Battery Energy Storage
  - Shortlisted Selections

• Total Capacity
  - 6.4 MW
  - 15 MWH

• Usage Case
  - Substation Deferral
  - Frequency Regulation
  - Generator Load Support
  - Peak Load Reduction
Case Study #2 – New York BQDM

- Substation Needing Upgrade
  - ~$1 Billion for Wires Option
  - Desire for Cheaper Non Wire Alternatives

Options
  - Energy Efficiency
    - Lighting
    - HVAC
  - Generation
  - Incentives
Example 1 – Brooklyn Queens Demand Management (BQDM)

- Major Brooklyn Hospital
- Fuel Cells Installed
  - 3100 kW Across Multiple Buildings
  - Modules desired for islanding condition
  - Greater Clarkson Avenue Microgrid
Example 1 – Brooklyn Queens Demand Management (BQDM)

Greater Clarkson Avenue Microgrid
Questions?