EBC Energy Resources Webinar: Energy Infrastructure Resiliency – Adapting to a Changing Climate
Welcome

Marc Bergeron

Chair, EBC Energy Resources Committee

Associate, Epsilon Associates, Inc.
Introduction and Program Overview

Matthew Waldrip

Program Co-Chair

Supervisor – Licensing & Permitting

Eversource Energy
Microgrids & Energy Storage – Moving them from Paper to Solid Ground

Mark Evlyn

Associate Director

Distributed Energy Services
Microgrids & Energy Storage
From Paper to Solid Ground
May 2020
TRC: A Grounded Perspective

Half a century delivering efficient, resilient systems.

Mark Evlyn
Associate Director of Engineering, Microgrids and Storage
15 years of complex utility-scale engineering of storage, PV, microgrids; business and entrepreneurship perspective

25 utility, city, and community DER projects, over 50 years of service
Utility role evolving to better serve the modern grid
Utility ‘the other Infrastructure’

[enable & empower]
- Staffing & resources
- Partnerships
- Education, training, & outreach

[design & deliver]
- Infrastructure upgrades
- Community microgrids
- Energy storage

[innovate & transform]
- Goals & targets
- Resiliency & reliability
- Systems thinking & integration

PEOPLE & PLATFORMS

POLICY & PLANNING

PROJECTS & PROGRAMS

Grid Modernization

ENERGY AND ENVIRONMENT

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Adapting Infrastructure

Energy Storage

Solar Photovoltaic

Generator

Utility Grid

Microgrid Controls

Controllable Load
Conventional Grid Constraint

• 11,000 customers downstream Wellfleet Substation
• Served by a single line from Wellfleet to Provincetown
• In the past 6 years, customers have experienced several multi-hour outages
Conventional Solution

New transmission line through 13 miles of Cape Cod National Seashore
Integrating Conventional and Advanced Solutions

Conventional
Utility generation, unidirectional distribution, traditional IT/OT

How are utilities implementing these new solutions?
Integrating Conventional and Advanced Solutions

Advanced / Distributed
Distributed energy resources, storage, DERMS, demand response, energy efficiency, interconnection, grid operations, rates/tariffs, system upgrades, cybersecurity

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New Solution Set

How are utilities implementing these new solutions?
Solution must meet today’s priorities

- **Minimize environmental disturbance**
  - Avoid construction through Cape Cod National Seashore

- **Reduce GHG Emissions**
  - Support existing and future solar installations
  - Peak load reduction → decreased need for upstream peaking generators

- **Maintain/improve aesthetics**
  - Brown-field improvement
  - Maintain ‘picturesque’ peninsula view

How a solution for reliability was thoughtfully approached to maximize environmental benefits
Today’s priorities: continued

- **Reliability**
  - Mitigate peak loads and flatten “duck curve”

- **Resiliency**
  - Provide backup power during grid interruption

- **Grid modernization**
  - ‘Microgrid-ready’

- **Job growth**
  - Emerging environmental and energy sector

The duck curve shows steep ramping needs and overgeneration risk
Deriving the right mix

- System Modeling
- Technical
- Social
- Regulatory
- Environmental
- Cost/Benefit

Li-ion
A lithium-ion battery that can provide multiple hours of backup power in the event of a grid interruption.
Typical Containerized ESS
Building Enclosure Examples
Questions?
Thank You

Mark Evlyn
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Moderated Discussion

Moderator: Tom Rooney

Program Co-Chair

Vice President, Advanced Energy Services

TRC
Closing Remarks

Marc Bergeron

Chair, EBC Energy Resources Committee

Associate, Epsilon Associates, Inc.