Distribution Planning to Enable Massachusetts 2050 Decarbonization Roadmap

MassCEC’s Net Zero Grid Planning Lab Workshop #1

February 3, 2022
Workshop Plans

Three collaborative workshops (Task 1)

Today: Distribution Planning

March 4th: Identifying Barriers and Opportunities to Achieve
10am – 12pm ET

April 13th: Distribution System Costs to Achieve
2pm – 4pm ET

... to enable Massachusetts 2050 Decarbonization Roadmap
Today’s Agenda
12:00 – 2:00 pm

➢ Welcome, Introductions, and Workshop Objectives
➢ Decarbonization Pathways Distribution System Impact Areas
➢ Panel Session - Distribution Planning Process
➢ Questions and Discussion
➢ Feedback and Plans for Workshop #2

Active participation is appreciated!
## Invited Stakeholders

### Today’s Speakers
- Rob Sheridan – EPRI
- Ariel Horowitz – Mass CEC
- Digaunto Chatterjee - Eversource
- Lavelle Freeman – Eversource
- Gerhard Walker – Eversource
- Gia Mahmoud – National Grid
- Dom Fuda – National Grid
- Balaji Doraibabu – National Grid

### Invited Stakeholder Groups
- Attorney General's Office Massachusetts
- Electric Power Research Institute (EPRI)
- Eversource Energy
- Executive Office of Energy and Environmental Affairs
- Advocacy Community
- Massachusetts Clean Energy Center
- Massachusetts Department of Energy Resources
- Massachusetts State Legislature
- Metropolitan Area Planning Council
- National Grid
Project Overview

MassCEC’s Net Zero Grid Planning Lab is an opportunity to build consensus and strategy around distribution grid changes needed to reach Net Zero by 2050.

As a non-profit research institute that provides thought leadership to help the electricity sector technology gaps and broader needs, EPRI will:

- Highlight barriers and opportunities to meeting the Net Zero goal, presented in these workshops and a white paper with applicability to the 2030 CECP; and
- Use survey results and utility data to forecast customer adoption rates of new beneficial technologies on a sample of representative feeders and then extrapolate those results to understand the impacts of technology adoption across the Commonwealth.
Opening Remarks

Digaunto Chatterjee
Vice President - System Planning
Eversource

Gia Mahmoud
Vice President – Future of Electric
National Grid
Today’s Workshop Objectives

1. Highlight elements of the Decarbonization Pathways that may impact the electric distribution system

2. Review Distribution Planning Processes that drive investment decisions to safely, reliably and cost effectively operate the grid

3. Discuss objectives of next workshop which will focus on barriers to achieve and opportunities for cost efficiency

Enabling Massachusetts 2050 Decarbonization Roadmap
2050 Decarbonization Pathways
2050 Pathway Elements

Distribution Planning Considerations

- Magnitude of Demand (kW)
- Energy Requirement (kWhr)
- Load Profile (daily, weekly, monthly)
  - Temporal Coincidence
  - Intermittency
- Location and electrical connectivity
- Flexibility
  - Alignment to local needs
Distribution Planning Panel Session
Panelists

Rob Sheridan
EPRI
Technical Executive Consultant
Distribution Operations & Planning

Lavelle Freeman
Eversource
Director
Distribution Planning

Domenico Fuda
National Grid
Director
Electric Strategy Activation
Future of Electric

Gerhard Walker
Eversource
Principal Engineer
System Planning

Balaji Doraibabu
National Grid
Director
Advanced Data & Analytics
Future of Electric
Electric Distribution Systems
**Derivatives Scenarios**

- **Base, High and Low**
- **Probabilities**

<table>
<thead>
<tr>
<th>DER</th>
<th>NG Forecast projections</th>
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<tr>
<td>Solar PV</td>
<td><strong>Base</strong>: Meet pro-rata of CECP goal by 2030</td>
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<tr>
<td>Energy Storage</td>
<td><strong>Base</strong>: Meets state’s 2025 targets. No explicit State target in CECP</td>
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<tr>
<td>Electric Vehicles (EVs)</td>
<td><strong>Base</strong>: Meet CECP goal (50% by 2030 and 100% by 2035)</td>
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| Electric Heat Pumps (EHP)    | **Base**: Delayed achieve CECP goal by 2036
                                      **High**: On-target by 2030 |
Eversource – Advanced Forecasting

**Distribution Planning Horizon**

**Objective**: Identify system constraints in the next 10 years to initiate capital projects with sufficient lead time to address demand

- Identification Funding
- Siting
- Construction
- Design/Evaluation
- Permitting

**Top**
- ISO, State Level, and Company Forecasts
- Electric Vehicles
- Solar Adoption
- Energy Efficiency

**Bottom**
- New Business
- Contractual Reserve Capacity
- Econometric Load Model

**Peak Load Forecast**

**Long Range Electric Demand Assessment**

**Objective**: Convert the Commonwealth’s Policy Objectives to Electric Demand at a Station and Feeder Level to determine the degree to which projects will enable electrification goals in a specific region

**Top**
- State Policy Objectives/Pathways
- Federal Policy Objectives

**Bottom**
- Socio – Economic Modelling based on Customer Reference Classes
- EV Adoption Propensity
- PV Adoption Propensity
- Storage Adoption Propensity
- Electric Heating Adoption Propensity

**Today**

**Today + 10 years**

**2050**

**yyyy**

% - Electrification Objective

**Safety First and Always**
Looking Forward
Feedback and Considerations for Workshop #2

Identifying Barriers to Achieving Massachusetts 2050 Decarbonization Roadmap
Together…Shaping the Future of Energy™