

MARCH 21, 2024

# Berkshire County Regional Planning Commission

*Electric Sector Modernization Plan*

# Agenda

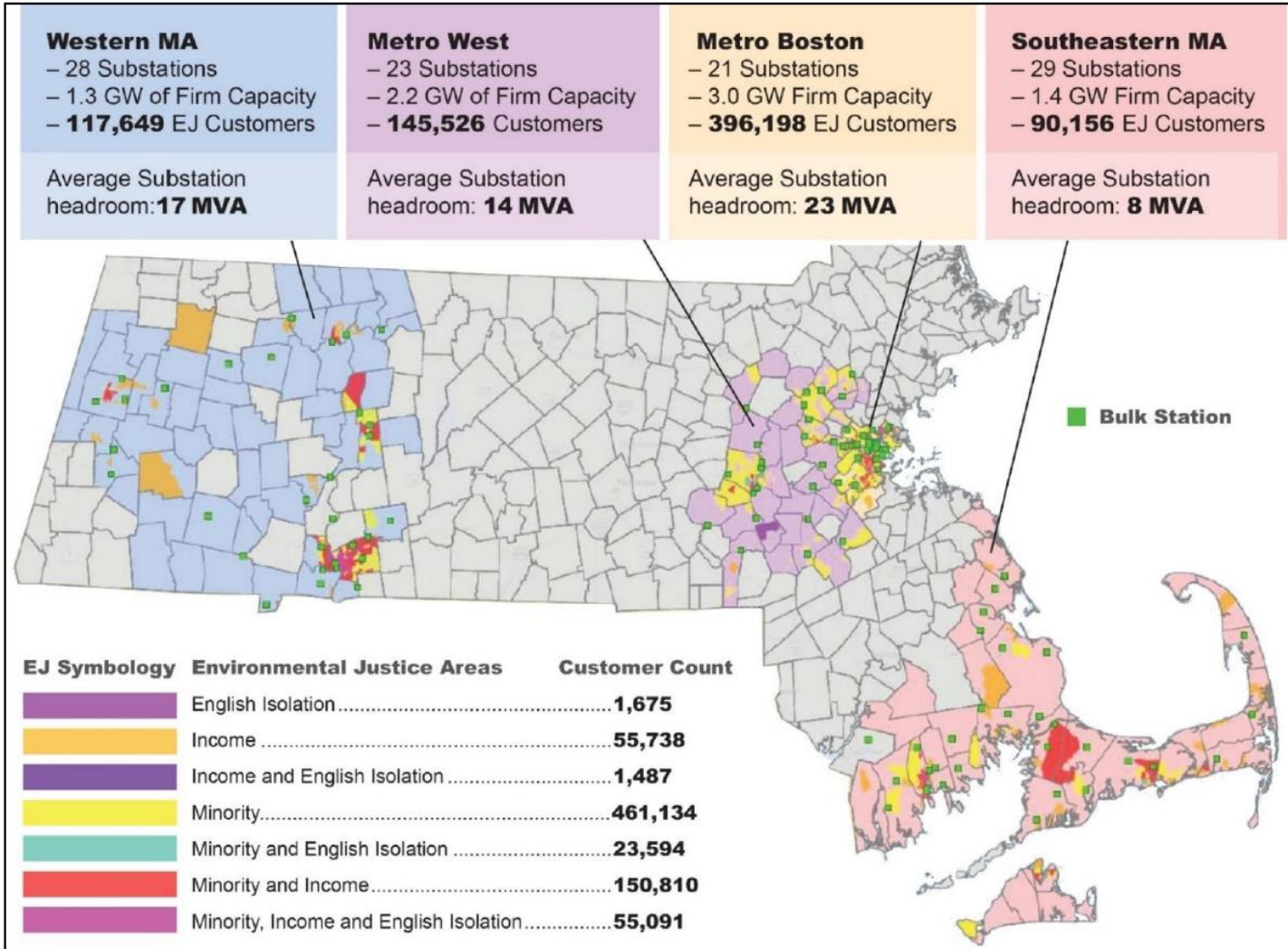
- Electric Sector Modernization Plan (ESMP)
- Transmission Upgrades Necessary for ESMP
- Stakeholder Engagement

# Electric Sector Modernization Plan (ESMP)

*A Comprehensive Roadmap to Achieve Massachusetts' Clean Energy Goals*

# Current State of the Distribution System

Very little headroom to reliably enable electrification and clean energy resources in all communities

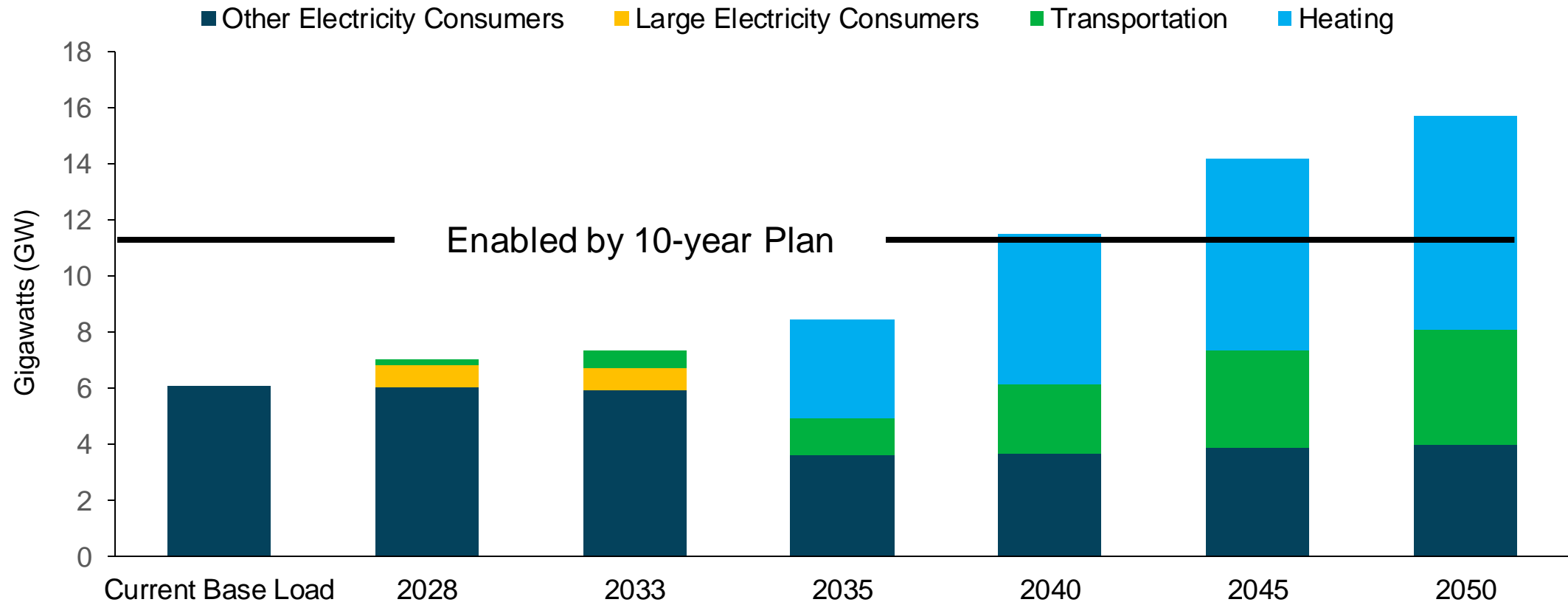


Source: Eversource ESMP Figure 4-13

# ESMP Investment Drivers

**20% INCREASE IN DEMAND BY 2033 AND 150% BY 2050**

10-Year plan meets 85% of 2050 goals



Increases in **electric vehicles** projected to add **1.3 GW of winter demand by 2035**



Increases in **zero-carbon heating** projected to add **3.5 GW of winter demand by 2035**

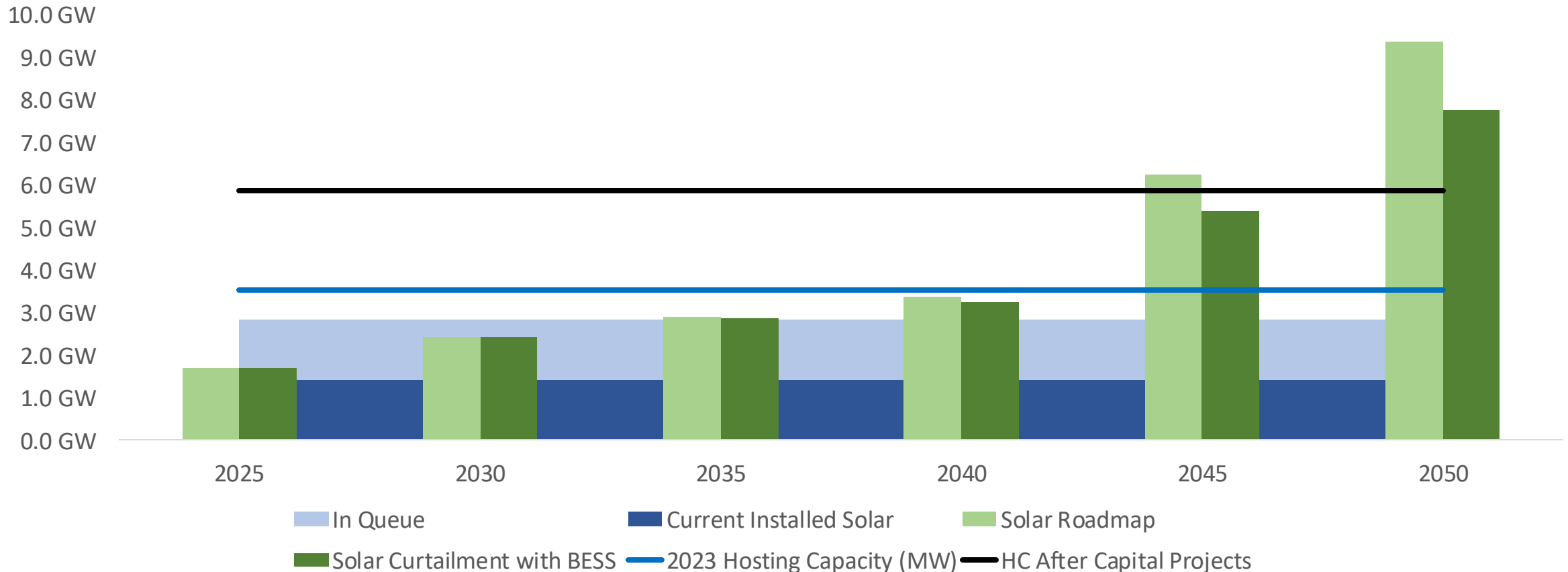
# Solar Enablement

## COMMONWEALTH GOAL CALLS FOR 6GW BY 2045 AND 9GW BY 2050

10-Year infrastructure and policy plan achieves 76% of 2050 goals

No changes to CIP cost allocation framework, planning remains based on existing queue

Approved, Pending and Proposed CIP Infrastructure plus Policy Incentives to meet 2050 Goals



# 2025-2034 Distribution Improvements

## 180% INCREASE IN ELECTRIC HOSTING CAPACITY

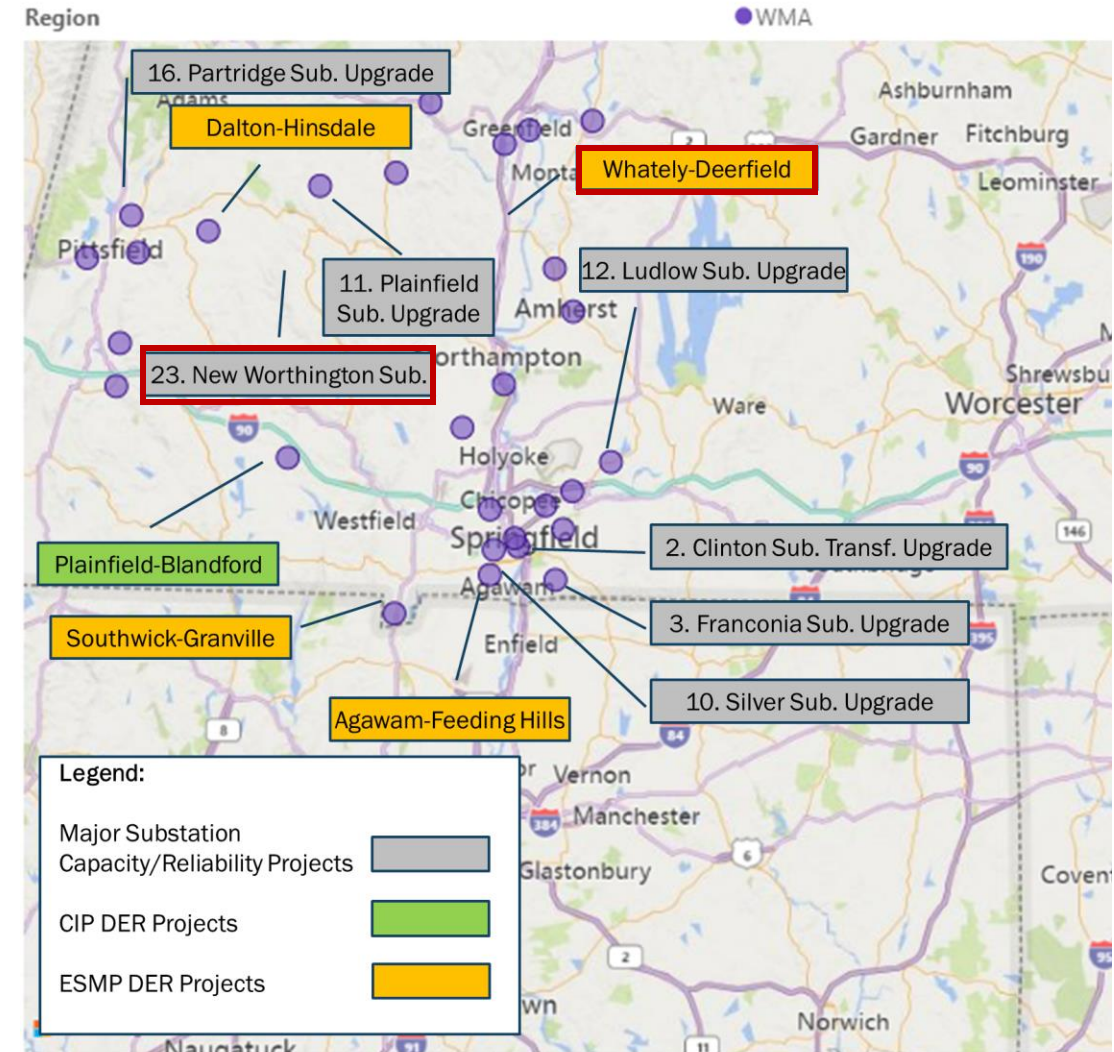
ESMP infrastructure upgrade plans remain the same over the ten-year time horizon

	Metro Boston	Metro West	Western	Southeast
Current total Number of Bulk Substations	21	23	28	29
Stations above firm Load or DER limit	11	9	11	11
New Stations	7	4	2	4
Station Upgrades	4	4	11	7
Incremental Electrification Capacity Enabled	1.2 GWs	0.5 GWs	0.8 GWs	0.8 GWs
Incremental DER Hosting Capacity Enabled	None	0.6 GWs	0.6 GWs	1 GWs
Number of Electric Vehicles Enabled	2.5 million			
Number of Heat Pumps Enabled	1 million			
Electrification Capacity (% of 2050 Goals)	82%	59%	138%	55%

# Location of Major Capital Projects in the 10-Year Plan

ESMP Section 6.8

10-Year Investment	2025-2029	2030-2034
New Substation/Substation Upgrade (Load Driven Capital Projects)	6 upgrades	1 new
New Substation/Substation Upgrade (DER CIP Solutions)	4 upgrades	1 new 2 upgrades





# Scenario Forecasts

## PROVIDED NEW SCENARIOS OF LOAD, GENERATION, AND ENERGY STORAGE

In addition to All Options “Baseline” scenario submitted to GMAC in the initial draft

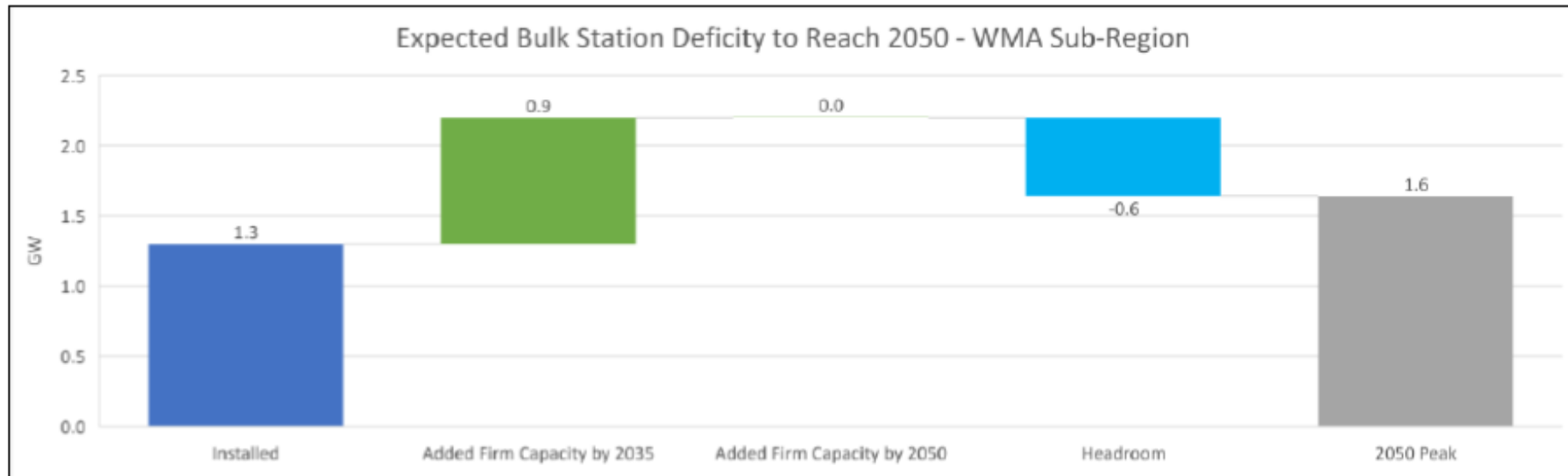
- Electric Vehicle scenarios include assessment of higher adoption rates and increasing range of managed charging from 20% to 75% with about 300 MW lower demand with 20% managed charging
- Heating electrification scenarios include assessment of slower adoption of heat pumps, various level of continued reliance on fossil fuel heating as well as demand response with about 2 GW lower electric demand with slower adoption of heat pumps and focused initially on partial heat pump solutions
- Overall goal is to provide increased transparency to stakeholders on demand and associated infrastructure costs
- Impact of storage more on increased solar enablement (~2 GW) than on demand reduction

*Table 9-12: Scenario Comparison and Direct Impact on the Electrification Peak Load Component in 2050 for the Western Sub-Region*

EV Scenarios	Heating Scenarios						
	Baseline	Hybrid	Phased	High Electrification	Full Electrification	Hybrid DR	Phased DR
Baseline	1,555 MW	1,314 MW	1,460 MW	1,486 MW	1,545 MW	1,307 MW	1,449 MW
MA CECP Adoption	1,576 MW	1,336 MW	1,482 MW	1,507 MW	1,566 MW	1,328 MW	1,471 MW
Moderate EVMC	1,489 MW	1,249 MW	1,395 MW	1,420 MW	1,480 MW	1,241 MW	1,384 MW
High EVMC	1,272 MW	1,031 MW	1,177 MW	1,203 MW	1,262 MW	1,024 MW	1,166 MW
Ideal EVMC	1,090 MW	850 MW	996 MW	1,021 MW	1,081 MW	842 MW	985 MW

# Policy Recommendations for Beyond 2035

## ADDITIONAL POLICY RECOMMENDATIONS TO WORK IN CONCERT WITH INFRASTRUCTURE UPGRADES

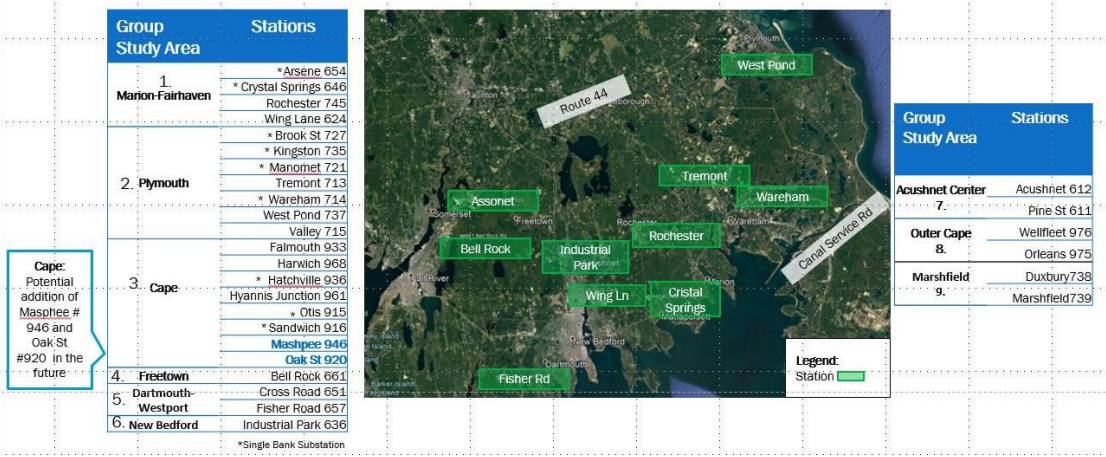


1. Increasing locational incentives to drive at least 25% penetration of ground source heat pumps
2. Drive toward 100% deep-energy retrofits
3. Retain about 15% hybrid heating
4. Incentivize at-work charging and charge management programs to achieve at least 20% reduction in EV demand
5. Mandate solar plus storage installations with a minimum 25% curtailment of solar
6. Direct future ground mounted solar growth to planned and proposed CIP infrastructure areas

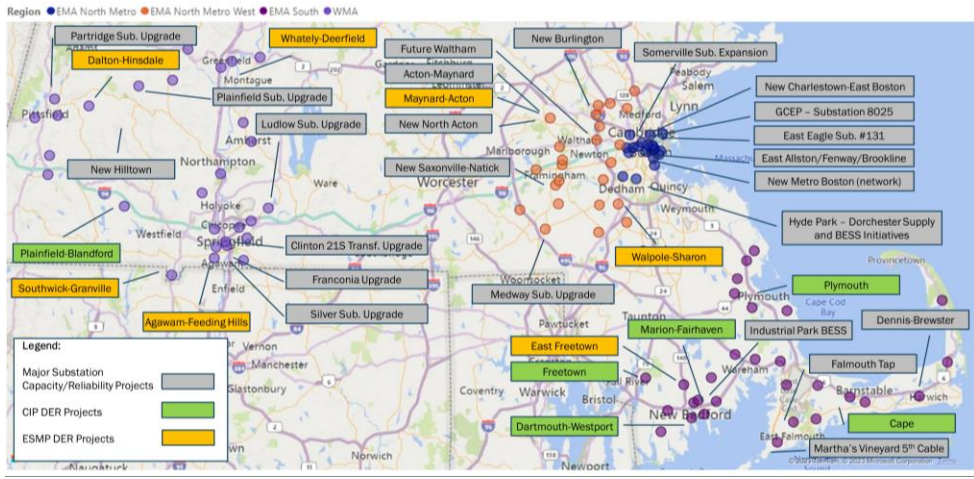
# Transmission Upgrades Necessary for ESMP

# Distribution System Changes Increasingly Triggering Transmission Upgrades

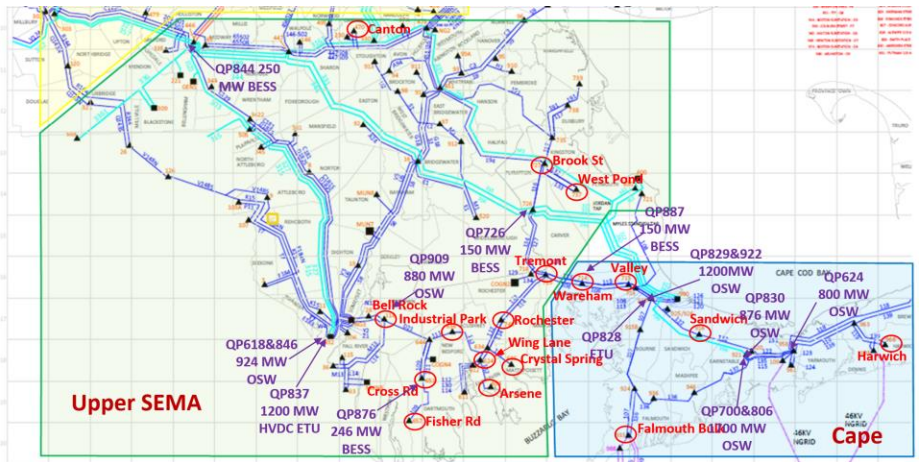
Capital Investment Projects (CIPs)



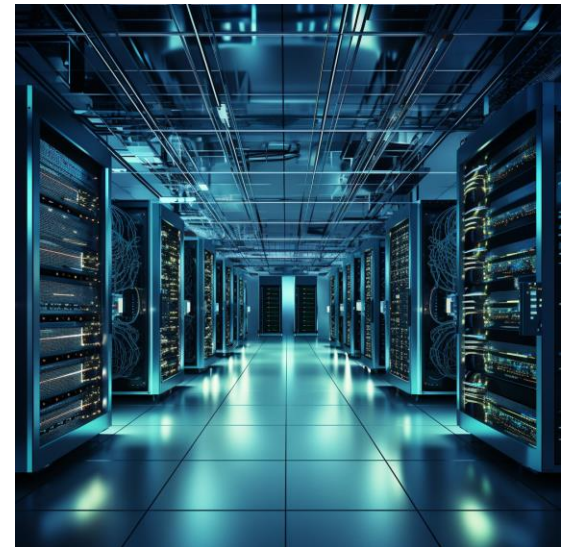
ESMP



DER Affected System Operator (ASO) Studies



Large Single Spot Loads

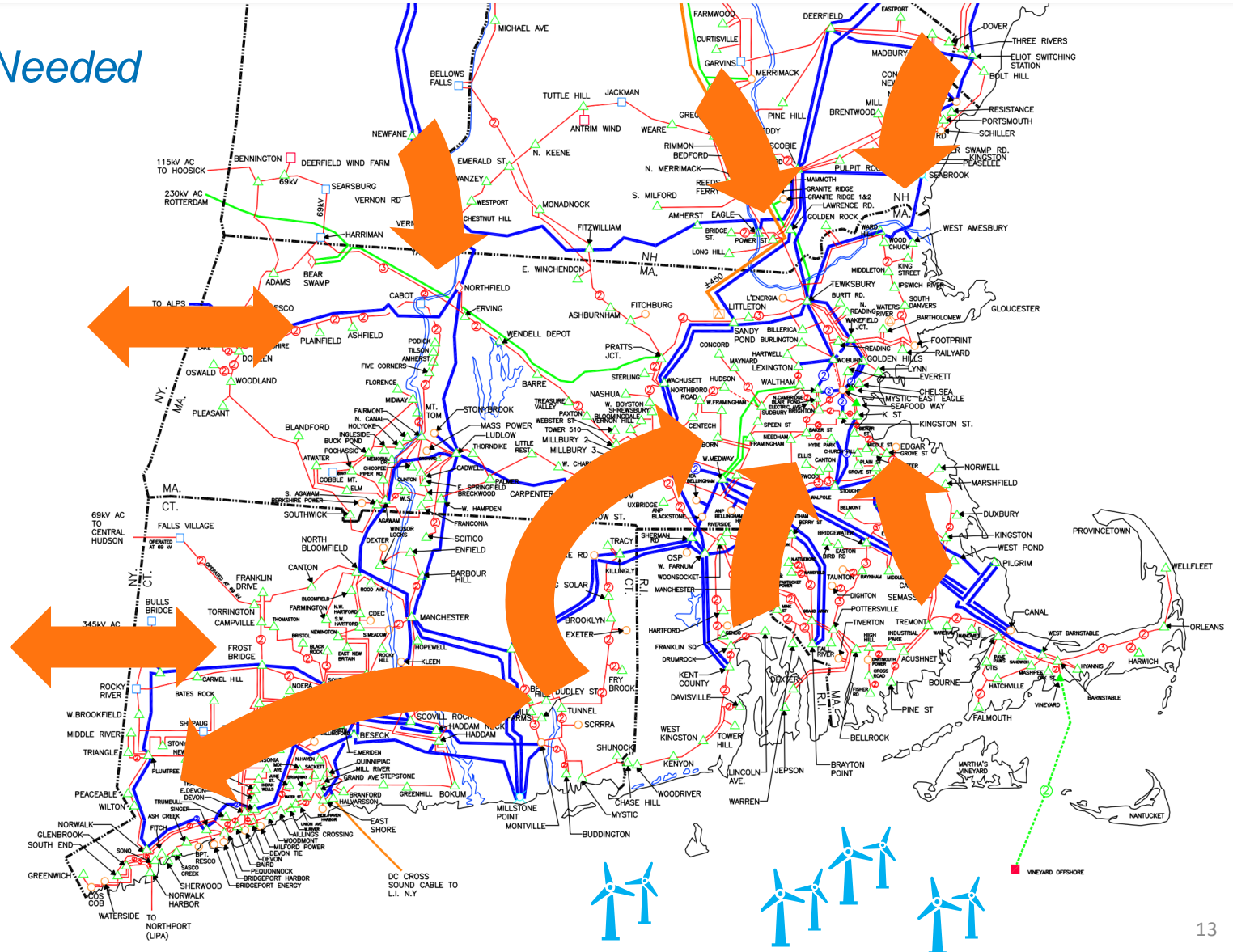




# Transmission Study Combines New Clean Energy Resources with ESMP

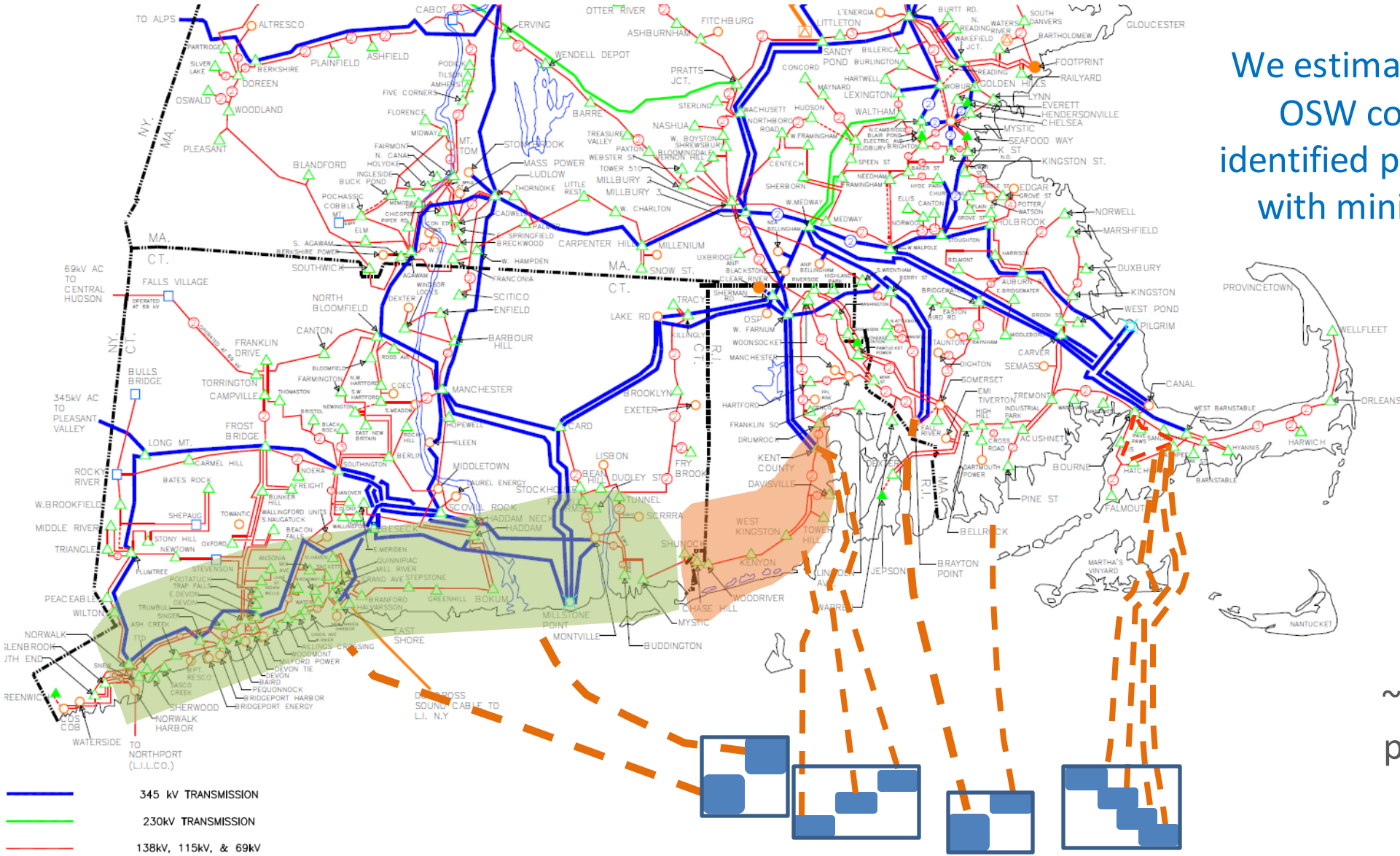
## *Additional Transmission Capacity Needed to Deliver Clean Energy*

- “No Regrets” themes have emerged from various analyses that indicate where new transmission capacity will likely be needed across multiple future scenarios
- Largely driven by locations of new generation and increased need for interregional transfers



# Offshore Wind Injection Points Continue to be Identified

We estimate that over **13 GW** of OSW could be connected at identified points of interconnection with minimal system upgrades



~ 8.3 GWs Total States' procurement authority

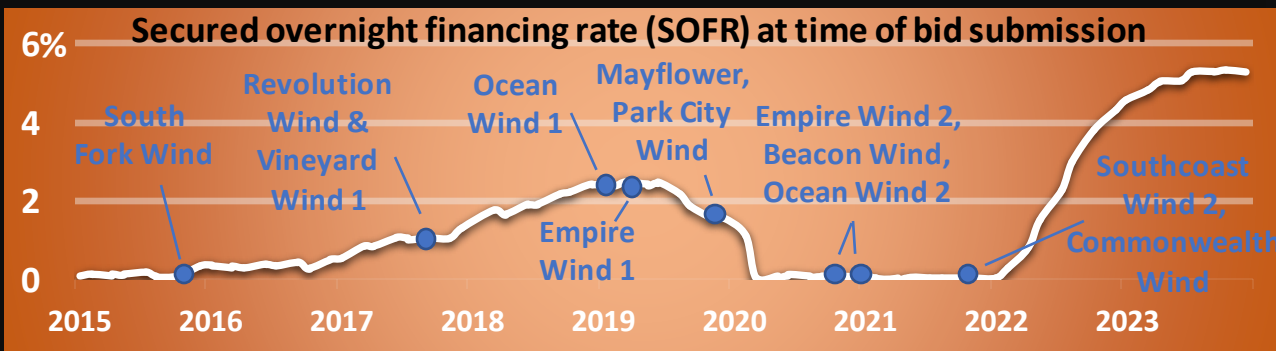


# US Offshore Wind Industry Financial Turmoil

First tranche of projects successfully took Final Investment Decision (FID)

Name	Size (MW)	ISD	Est. Cost	LCOE (\$/MWh)
South Fork Wind	132	<b>2023</b>	\$1B	163
Vineyard Wind	800	2024 (Jan)	\$6B	70
Revolution Wind	704	2025	\$4B	99

Over half of the contracted OSW capacity is seeking amendments to Power Purchase Agreement prices mostly due to inflation and rising project costs



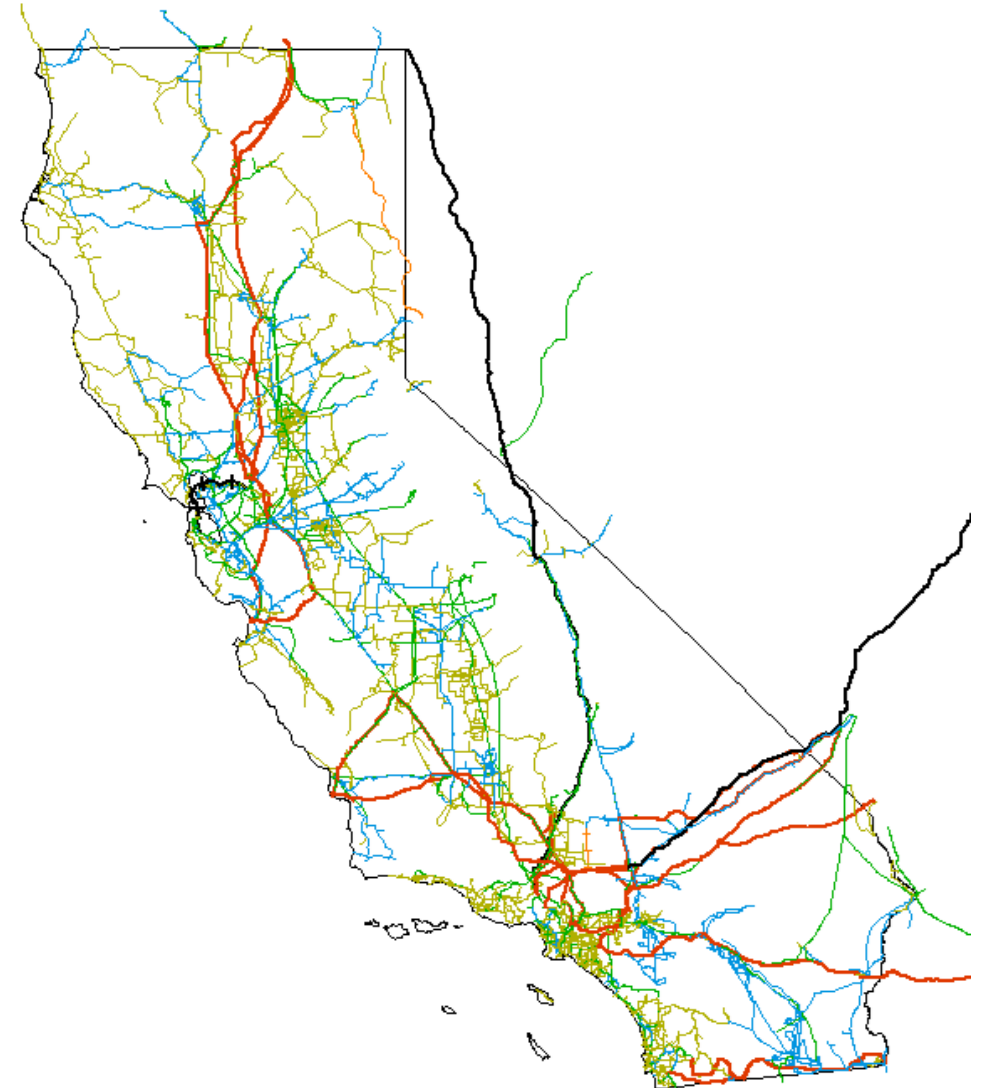
In Nov 2023, the Coastal Virginia Offshore Wind project (2,600 MW) filed to lower its LCOE from \$90/MWh to \$77/MWh and is starting onshore construction in Q1 2024



# New England Must Expand Interregional Transfer Capability

## *Must Increase Intertie Capacity to other Regions to Deliver and Fully Utilize Clean Energy Resources*

- Massachusetts Decarbonization Roadmap identified the need for new transmission lines to Canada and New York
  - “...additional high-voltage interstate transmission, is required to reliably operate a cost-effective, ultra-low emissions electricity grid based on variable renewable resources.”
  - Need was observed in all scenarios examined
- As an example, CAISO's system peak load is roughly 50 GW (which is similar to New England's 2050 projections)
  - The sum of the Total Transfer Capability (TTC) of each individual CAISO intertie is over 44,000 MW
  - New England's existing sum of TTC is merely around 10,000 MW
- The Western Energy Imbalance Market (EIM)
  - Utilizing existing Interregional Transmission Capacity, EIM resulted in over **\$1.7 billion in benefits during 2023**





# Stakeholder Engagement

# Municipal Outreach

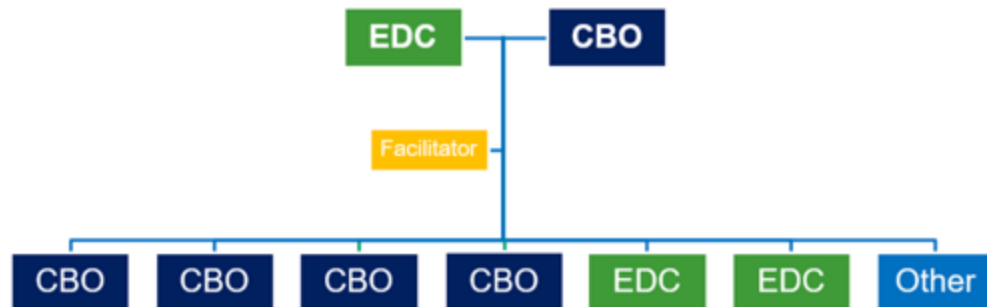
*The infrastructure needed to reach our **common clean energy goals** will occur at the **local level**, which requires close coordination with local **municipalities and developers** .*



- **Build shared understanding** around utility clean energy projects, the electric grid, local permits and permissions, and understanding municipal priorities.
  - Many municipalities have their own **local climate and clean energy goals**, economic development goals and housing needs.
- **Collaborate and develop trust** to better engage with and understand the interests of each of our municipalities, and how this clean energy transition benefits them.
  - Work to **ensure our stakeholders feel respected** and find ways to positively engage with communities
- **Continuous outreach** tailored to each municipality around specific clean energy infrastructure projects
  - Elicit, respond, and incorporate feedback

# Empowering our Communities

## Community Engagement Stakeholder Advisory Group



- **Co-Develop a Community Engagement Framework** with communities to guide the EDCs for large clean energy projects that will include best ways to engage communities about proposed projects and solicit their feedback.
- Help to **facilitate an evolving feedback loop** with communities and **prioritize the voices of disadvantaged communities** in clean energy project decisions that impact them.
- **Enable continuous constructive engagement** geared towards making the process of implementing the ESMP **more transparent and increasing EDC accountability** to impacted stakeholders
- **Ensure historical obstacles to stakeholder engagement** such as language barriers or the location/time of engagement sessions **are acknowledged and addressed** to ensure the widest possible level of community participation