Office of Energy Transformation: Financing the Transition Work Group Informational Webinar

October 21, 2024

Agenda

1. Welcome, Introductions, and Agenda Review (5 min)

2. Overview of Office of Energy Transformation, Context, and Focus Area Work Group (FAWG) Process (10 min)

3. Overview of and Background on How the Electric Grid is Changing, Investments to Support Evolving Policy, Customer and Grid Needs, Utility Regulation, Ratemaking and Cost Recovery, Customer Bills (35 min)

4. Review of Financing the Transition Workplan and Future Convenings (15 min)

5. Response to Questions and Next Steps (15 min)

Massachusetts Policies, Programs, and Focus

Mandates to mitigate greenhouse gas emissions, drive efficiency, and deploy clean energy

Programs and regulations that implement mandates and achieve climate, clean energy, and consumer-focused outcomes

A focus on equity, affordability, economic opportunity, and environmental justice

2050 CECP pathways to accomplishing the Commonwealth's net zero greenhouse gas emissions goals[1]

Transportation

97% of light-duty vehicles (5 million) electrified

93% of medium- and heavy-duty vehicles (over 350,000) electrified or non-emitting

Buildings

80% of homes (over 2.8 million) heated and cooled by electric heat pumps (including those with on-site fuel backups)

87% of commercial space heated by either electricity or alternative fuels

Electric Power

2.5-fold increase in electric load compared to 2020

97% of electricity consumed is from clean and renewable sources

Non-Energy and Industrial

52% of industrial energy use electrified

Office of Energy Transformation

- Established May 1, 2024, this first-in-the-nation Office of Energy Transformation (OET) is charged with:
  - Enabling the hands-on execution of the clean energy transition, including:
    - gas-to-electric transition coordination,
    - electric grid readiness, and
    - a just and equitable transition for workers, businesses, and communities.
  - Establishing an Energy Transformation Advisory Board ("ETAB" or "Advisory Board") to accelerate cooperation, understanding, and action among all stakeholders to transform the energy ecosystem.

Mission and Structure

Energy Transformation Advisory Board

To provide guidance and recommendations on strategic direction to the OET and focus areas work groups to execute the energy transition, including gas-to-electric transition, electric grid readiness, and the just and equitable transition for workers, business, and communities.

Transitioning Away from EMT	Decarbonizing the Peak	Financing the Transition
To develop a coordinated strategy to reduce and ultimately eliminate the local gas distribution companies' reliance on the Everett Marine Terminal (EMT) Liquified Natural Gas (LNG) facility aligned with DPU Order 20-80 and the state's climate and clean energy mandates, including those established in the *Global Warming Solutions Act*.	To demonstrate pathways to reduce reliance on and expeditiously eliminate fossil fuels from peaking power plants and combined heat and power facilities and deploy alternative demand and supply side options to meeting peak load needs in the Commonwealth, in alignment with the electric sector sublimit and clean energy goals established in the *2050 Climate and Clean Energy Plan*.	To identify alternative mechanisms for financing/funding electricity distribution system infrastructure upgrades necessary to achieve the Commonwealth's clean energy and climate mandates that minimizes impacts on consumers' electricity bills, while providing an affordable, sustainable and timely source of revenue to support investments.

Governance, Responsibilities and Expectations of Participants

Governance

Participation is open, with membership affirmed by Advisory Board

Meet at least bi-monthly, or more often, depending on need

FAWGs will conduct work via individual workstreams, which will meet as necessary

FAWG participants can select workstreams

Workstream and full FAWG meetings are Chatham House Rules; all materials provided to the Advisory Board will be made public

Deliver consensus work products and recommendations to the Advisory Board, where consensus is not possible, note participant positions

Responsibilities

Execute workplans approved by the Advisory Board and deliver recommendations for Advisory Board deliberation and approval

Establish workstream teams to advance workplans, establish milestones, and make recommendations

Review and seek consensus on deliverables and recommendations

Align around options to be presented to the Advisory Board, where consensus is not possible, participant positions are to be noted and accurately reflected

Expectations

Commit to a one-year term and actively participating and attending meetings (all meetings will have a virtual option)

Are subject matter experts/have a command of the topic

Have a level of decision-making authority, if participating on behalf of an organization

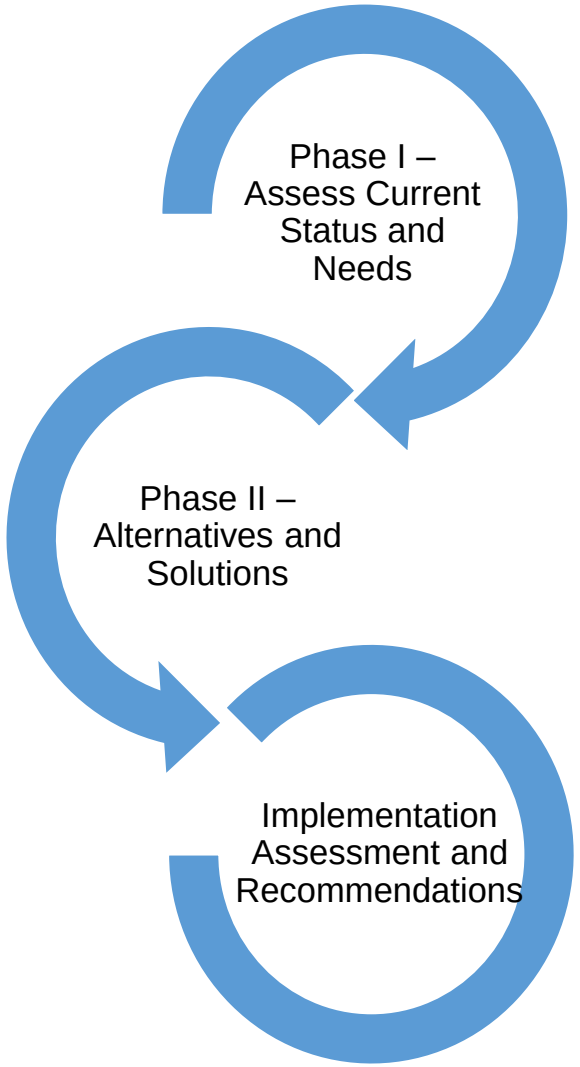
Follow the workplans and process adopted by the Advisory Board

Work in good faith to seek consensus

Adhere to the Ground Rules and Remote Participation policies adopted by the Advisory Board; failure to comply can result in removal

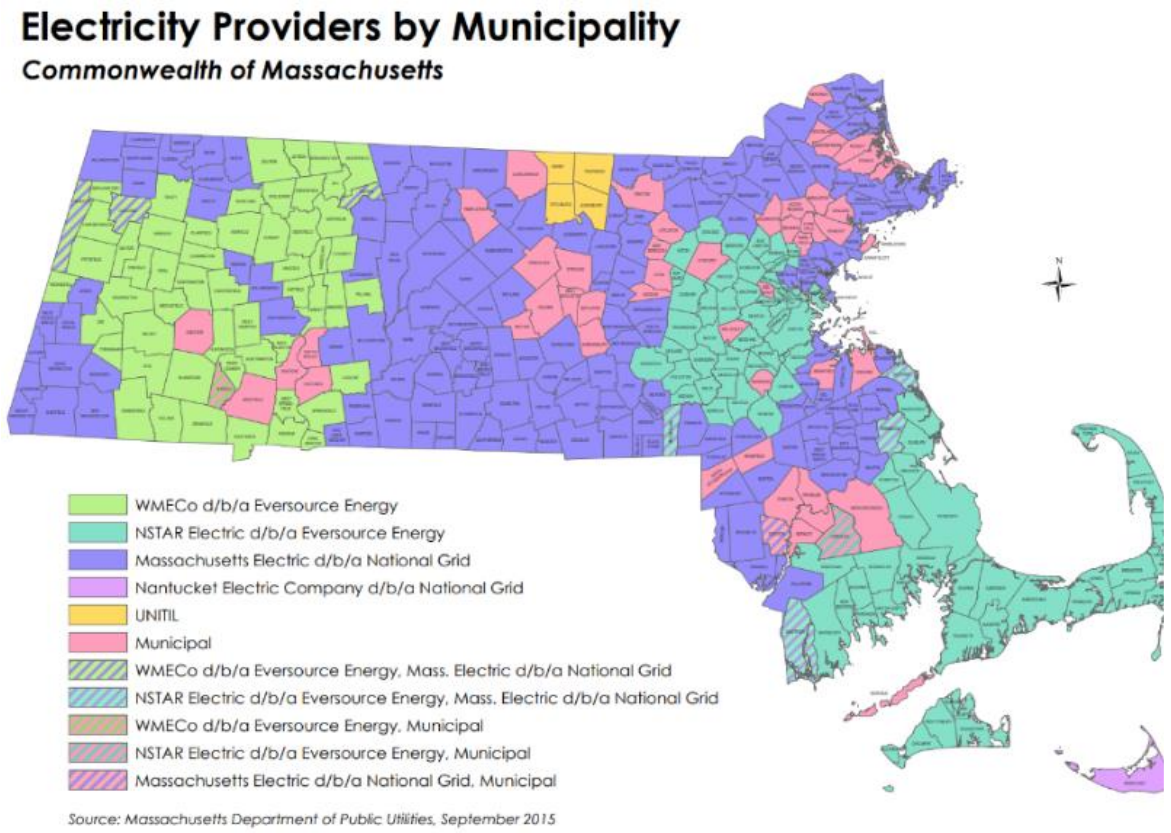
Approach and Process

- Decision-making to follow a methodical approach
  - Each FAWG launches with a webinar and follows same phased approach:
    - Start with understanding the issues and perspectives and assessing current state
    - Identify and assess alternatives and potential solutions
    - Conduct implementation assessment and make recommendations
- Success requires:
  - Commit and align
  - Engage and enable
  - Implement and sustain

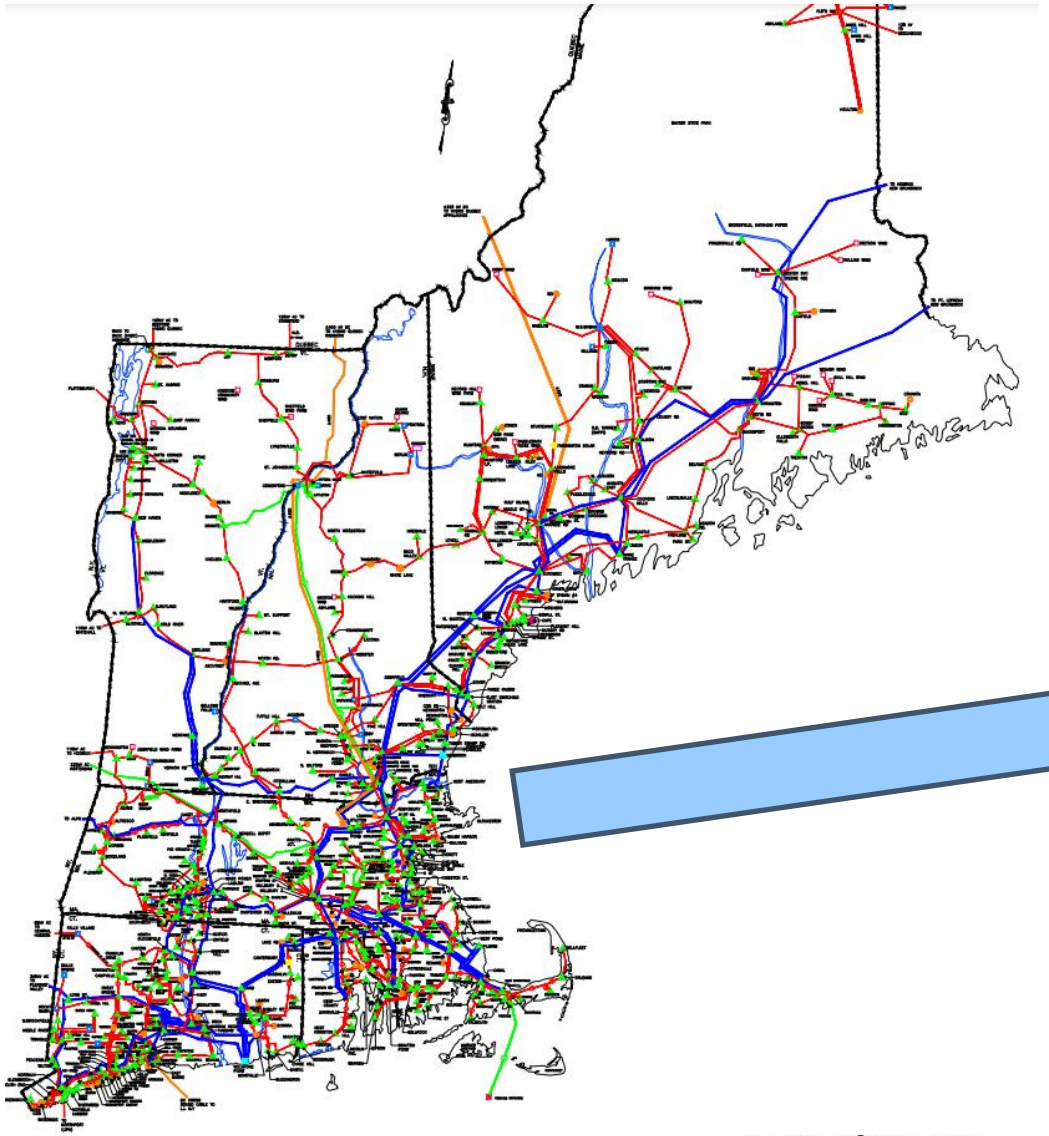


Massachusetts' Electric Utilities

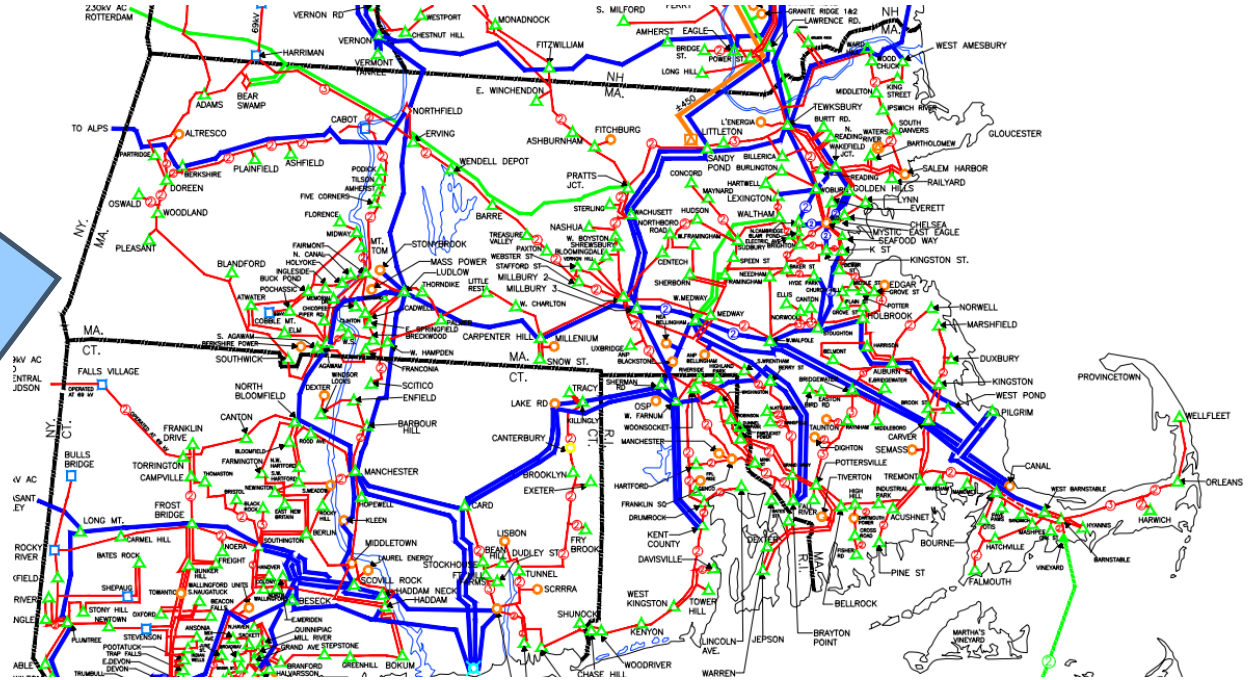
- The term "electric utility" refers to electric companies that deliver power to end-use (retail) customers.
- There are other electric companies (e.g., power plant owners) in the state but they are not *utilities*.
- Massachusetts has three investor-owned electric distribution utilities (EDCs) and 41 municipal utilities (known as Municipal Light Plants (MLPs)).
- Over 90% of electricity consumers in the state are served by the EDCs (Eversource, National Grid, Until)
- Since the electric industry in Massachusetts was restructured 20+ years ago (to allow for competition in the supply and purchase of power), EDCs do not own power plants (with some minor exceptions).
- EDCs build, maintain and operate the electric *grid*, including, for example, transmission and distribution lines, substations, poles, and transformers.
- EDCs purchase power only for those customers who do not choose to purchase power from competitive suppliers (default service) or approved municipal aggregators (cities/towns)



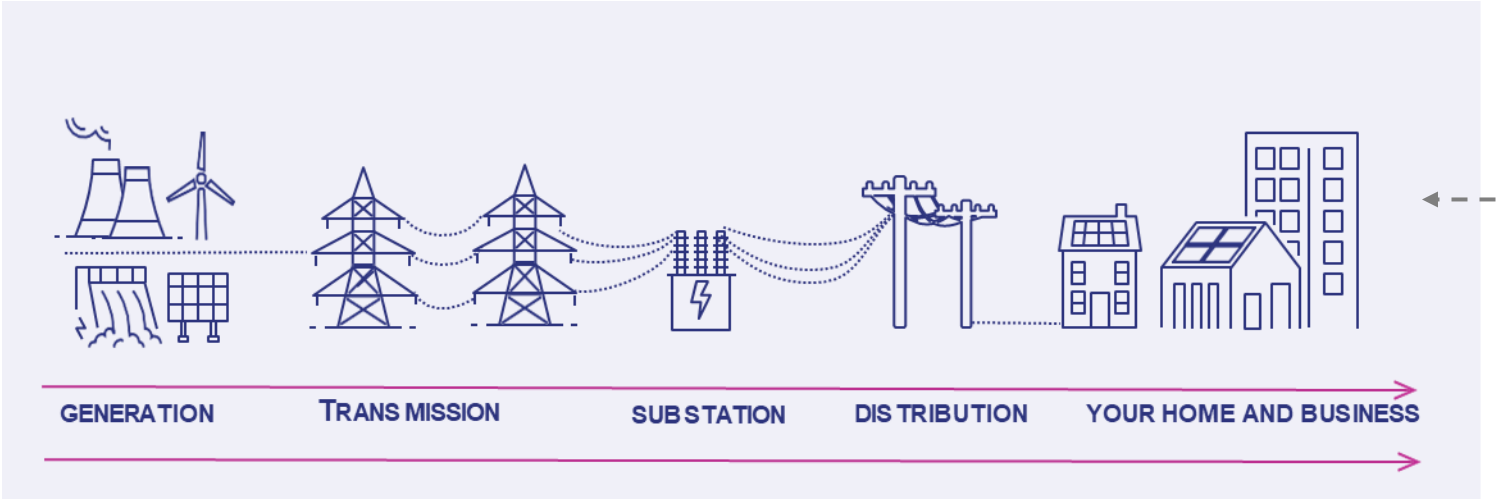
Massachusetts' and New England's Electricity Grid



Massachusetts' electric system is part of a 6-state integrated grid (with connections to New York and Eastern Canada as well), with power plants around New England dispatched economically to provide supply, and with power flowing over the grid to local electric utility systems that serve end-use consumers.



Current Electric Grid: Generation, Transmission, Distribution



***Recently*: "Distributed Electricity Generation"**

Small-scale power generation (e.g., solar) located on the customer's side of the electricity meter (New England = ~350,000 solar installations (6.5 GW))

Electricity generation (supply):

New England has ~ 400 power plants (~30 GW).

Electricity transmission (high-voltage delivery):

New England has ~9,000 miles of transmission lines

Electricity distribution (lower-voltage delivery):

New England has tens of thousands of local power lines

Who Regulates Electricity Rates/Prices and Services?

Electricity rates in Massachusetts have two primary components:

- Delivery (which is composed of distribution and transmission costs)
- Supply (which is the cost of retail electric supply – or the electric commodity itself).

DPU

The Department of Public Utilities (DPU) regulates the prices and other terms and conditions of the electricity-delivery rates EDCs charge to retail (end-use) customers, and which reflect the cost of providing local delivery service.

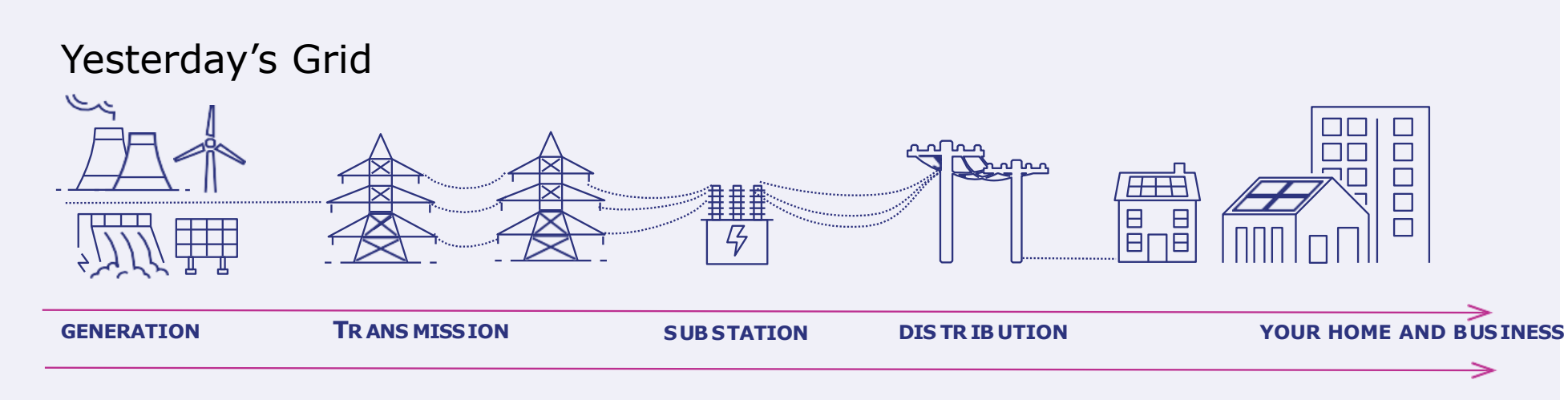
FERC

The Federal Energy Regulatory Commission (FERC) regulates the cost of service for transmission service (on the interstate high-voltage power system), with transmission service costs passed through in the utility bills charged to retail customers. FERC also regulates wholesale electricity markets (administered by ISO-NE in New England)

Electric supply-related charges (included in the utility bills charged to retail consumers) reflects, either:

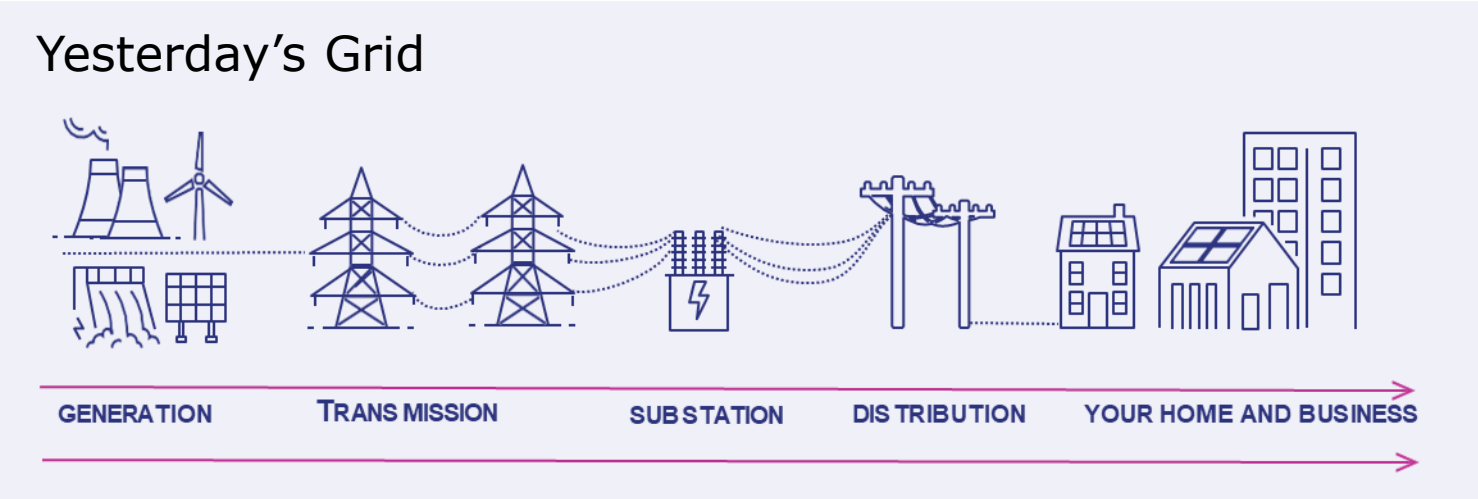
- Basic service prices (of competitively procured power by the utility and overseen by the DPU), or
- Competitive supplier prices (for customers that elect commodity service from a power marketer), or
- Municipal aggregation programs (with power procured by the local community)

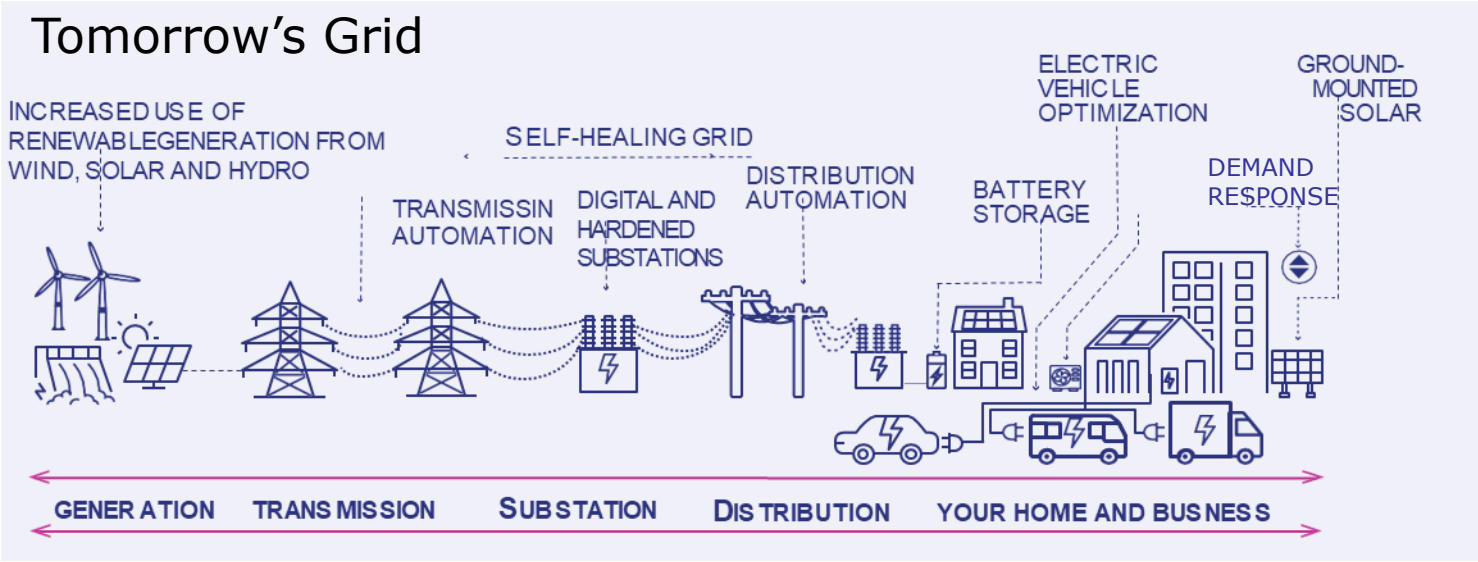
How has the Grid Operated?



- Power is produced by electric generating units owned by independent companies and connected to the high-voltage transmission grid operated by ISO-New England.
- One-way flow of power from those generators through the high-voltage grid, and then transformed to lower voltages and delivered over lower-voltage local distribution wires to end-use consumers.
- Consumers have the option to choose to buy power supply from:
  - a competitive retail power provider,
  - the EDC's basic service (which the utility procures from the competitive market).
  - cities and towns that have established "municipal aggregation programs"

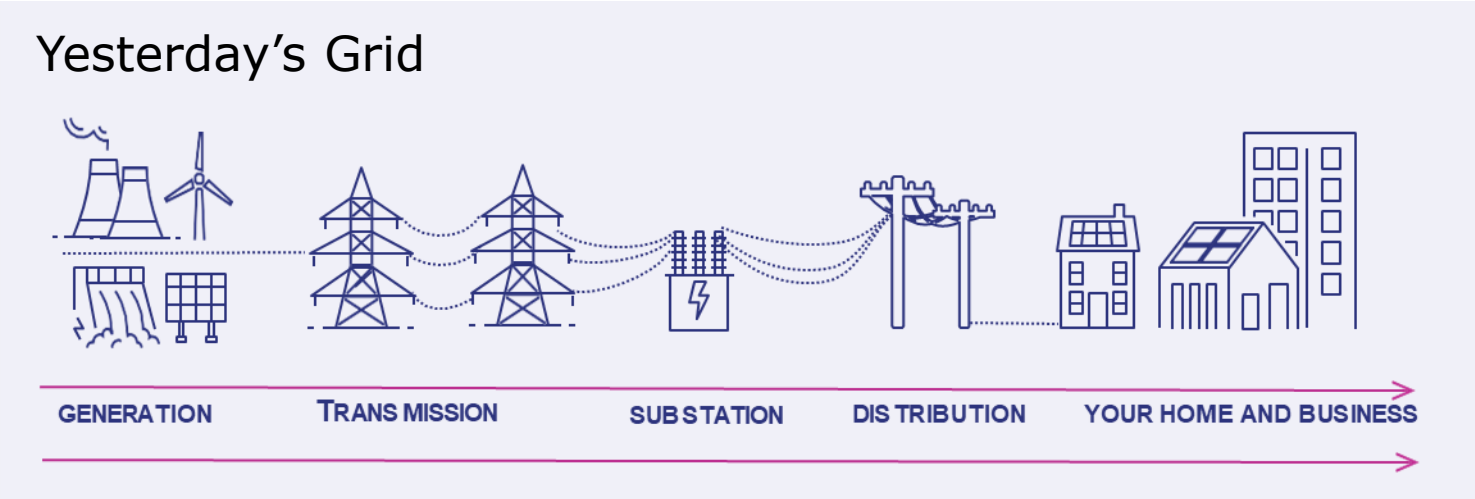
How is the Grid Changing and Why are Greater Investments Needed?

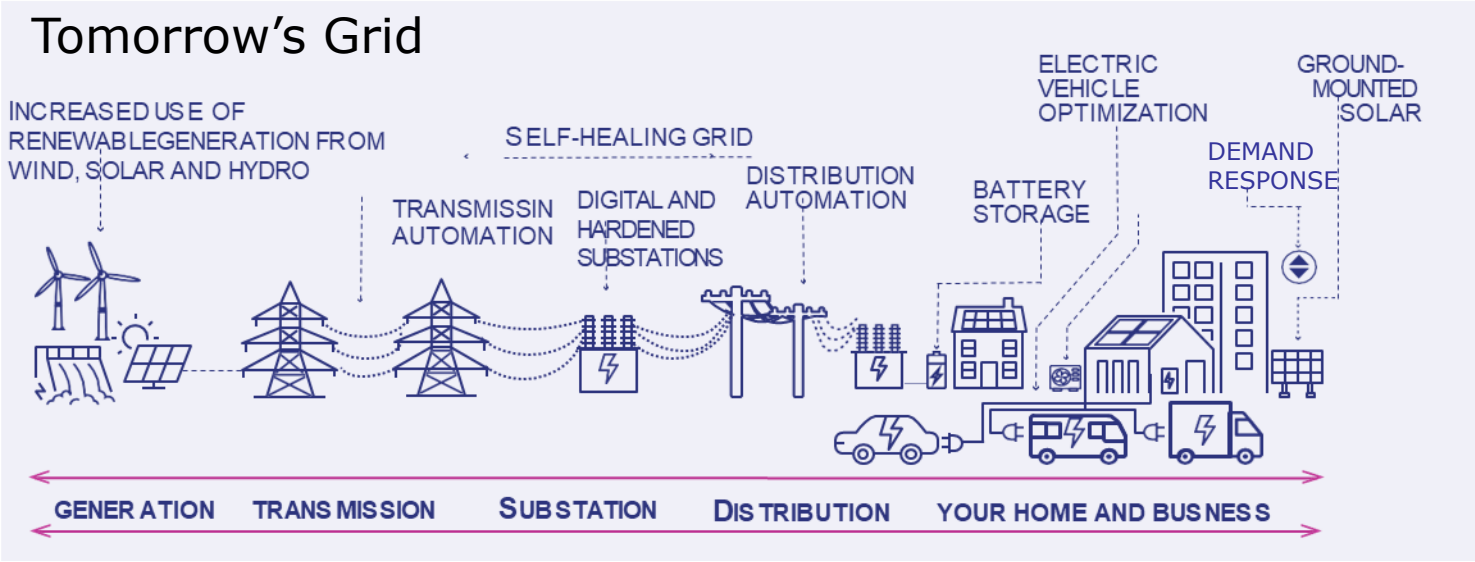




- The way electricity is produced, delivered and consumed is changing, with sources of electricity generation (e.g., solar, microgrids, battery storage) connected to the local distribution system.
- Power flows will be more dynamic, with the need to handle more injections and withdrawals of electricity into the local grid.
- This requires investment in the local electric grid to:
  - connect more clean energy.
  - support more electricity demand from electric vehicles, electric hearting and electrical end uses in buildings,
  - manage more information and control more technologies to ensure the stable, safe, reliable operation of the system and optimize grid-connected resources for customer and system benefit

Electric Sector Modernization Plans (ESMPs)



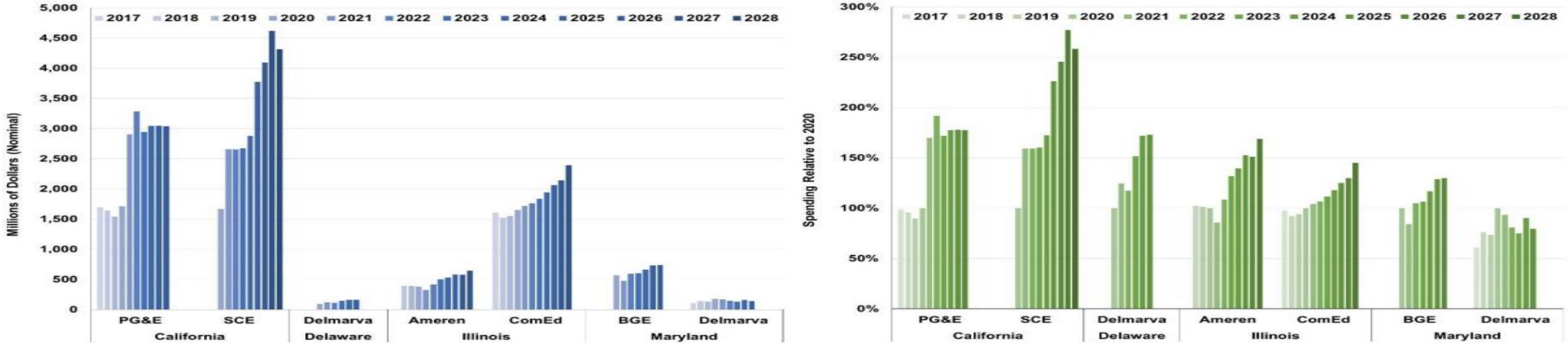


- ESMPs are strategic plans identifying the investments the EDCs view as necessary to enable Massachusetts to meet its climate goals and other mandates.
  - Each EDC prepared 5- and 10-year demand forecasts to determine the system upgrades and investments needed to support the energy transition and reliably meet demand (including new electrification loads).
  - The ESMP-related investments proposed for the next 5 years total ~ $5 billion and include projects to increase the flexibility and capacity of the electric distribution grid, expand customer programs targeting distributed energy and electrification, and add technology to optimize and automate grid operations, reduce demand, and manage costs to ratepayers.
- The DPU approved the ESMPs with modification in August 2024 and will launch further proceedings on the recovery of costs associated with investments that flow from the ESMPs.

Are other States Making Similar Changes to and Investments in Their Distribution Systems?

- Massachusetts is not alone is undertaking significant energy transformations with implications for needed new grid investments.
- Investment in modernizing electric distribution systems to perform the functions anticipated by the energy transition is growing, nationally.
- Distribution-system investment underway and proposed to meet transition needs here is consistent with a trend in increased investment across other jurisdictions (e.g., California, Illinois, Delaware, Maryland).

Historic and Planned Distribution System Capital Investments: Selected Utilities, 2017 to 2028



Note: [1] To ensure comparability across utilities, capital spending related to wildfire mitigation is not included for PG&E.

Regulation of Massachusetts EDCs' Prices and Services

- The DPU regulates the prices and other terms and conditions of the electricity-delivery rates EDCs charge to customers.
- The DPU is an independent regulatory agency with three commissioners appointed by the Governor.
- EDCs, like National Grid, Eversource and Unitil, may change their rates only after review and approval by the DPU.
- The DPU conducts its ratemaking responsibilities in a quasi-judicial fashion.
- Rates for delivery service are reviewed and approved through formal administrative-law proceedings (e.g., rate case dockets), in which:
  - the utility and other parties provide evidence and testimony for consideration by the DPU,
  - parties cross-examine witnesses, and
  - the DPU issues orders describing its findings and determinations.

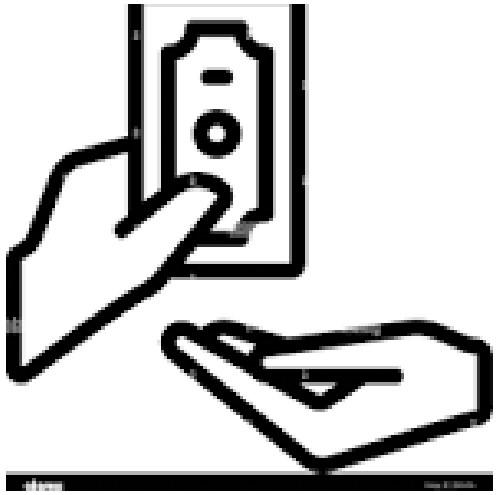
Utility Rates Based on the “Cost of Service”

- EDCs operate under a “cost-of-service” model, which provides EDCs the opportunity to recover costs associated with building, operating, and maintaining the electric distribution system along with a reasonable return on investment.
- Rates traditionally reflect the utility’s cost to provide service during a “test year,” with rates that vary by type of customer (e.g., residential versus commercial versus industrial) and by type of service (e.g., time-of-use rates versus basic service).
- Rates take into account: (a) expenses (such as labor, fuel used to operate utility trucks, maintenance of equipment), on which the utility is not allowed to charge a mark-up for profit, and (b) investments (such as the cost to construct and finance power lines, trucks, buildings and other equipment), on which the utility has the opportunity to earn a profit.
- In a rate case, the DPU decides which expenses and investments to allow into rates and whether to adjust amounts originally proposed.
- Rates are designed so that expected sales of electricity will produce revenues sufficient to cover the utility’s costs (i.e., the revenue requirement).

Utility Investment Through Customers' Rates

- Once the utility makes an investment and it becomes operational (e.g., is "used and useful" to provide utility service), the utility puts forward a request (usually in a rate case) that it be allowed to include that investment as part of its "revenue requirement" (i.e., its cost to provide utility service).
  - If determined by the DPU to be a prudent investment, then the dollar value of that investment is included in the utility's test year "rate base."
  - The rate base changes over time as new investments are made and deemed to be prudent, and as prior investments are depreciated over time.
  - The DPU sets the allowed rate of return the utility can earn on its undepreciated investments.
    - A utility is allowed to recover a return on the undepreciated amount of assets in its rate base.

Financing Costs for Utility Investment



Utilities raise capital to finance their investments through two sources:

- Debt: Utilities borrow from commercial lenders and others through loans and the issuance of bonds, at predetermined rates to repay the loan plus interest.

- Equity: EDCs sell ownership shares in their companies through the issuance of stock (whose value can vary over time).

When the DPU determines the amount of dollars to include in the utility's revenue requirement and customer rates in a rate case, regulators determine:

- the preferred "capital structure" – i.e., ratio of debt to equity
- the cost of debt
- the allowed return on equity – i.e., profit a utility can earn

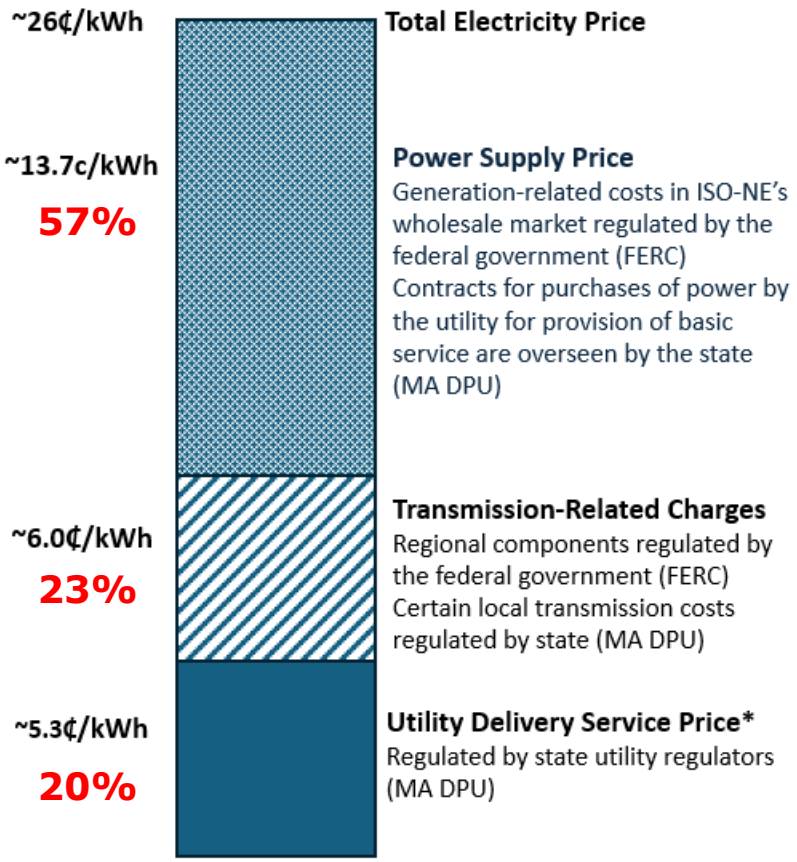
Cost of Capital:

- The DPU establishes the cost of capital by determining the ratio of debt and equity and the allowed cost of capital of each component (i.e., debt and equity), with a blended cost of capital applied as the return an EDC is allowed to earn on capital investments.

- This is incorporated into the utility's revenue requirement and collected in rates.

How are Utility Investment Costs Recovered? Who Regulates What Customers Pay?

Massachusetts Electricity Prices to Retail Consumers
(2022 data – average of electricity sales by investor-owned utilities)



* Local delivery price also includes various surcharges (e.g., for electric vehicle charging investments, renewable energy credits, energy efficiency programs) for state-mandated utility programs..

Data: Energy Information Administration 861 data for electric utilities selling bundled and unbundled electricity; with rough estimate of average local and regional transmission charges.

- The electricity prices/rates paid by consumers reflect the cost of:
  - Power supplies -- based on competitive wholesale market prices
  - Transmission -- reflecting the cost of building, operating and maintaining the high voltage transmission system that moves power longer distances
  - Local delivery (distribution) -- reflecting the cost of building, operating and maintaining the local electric delivery grid, as well as the cost of several state-mandated programs that benefit consumers (e.g., Mass Save programs, renewable energy credits).
- In 2023, power supply prices were lower (roughly 8 cents/kWh versus nearly 14 cents/kWh in 2022as shown in chart to the left).
- Total electricity costs can be higher or lower largely due to fluctuations in the cost of generation.

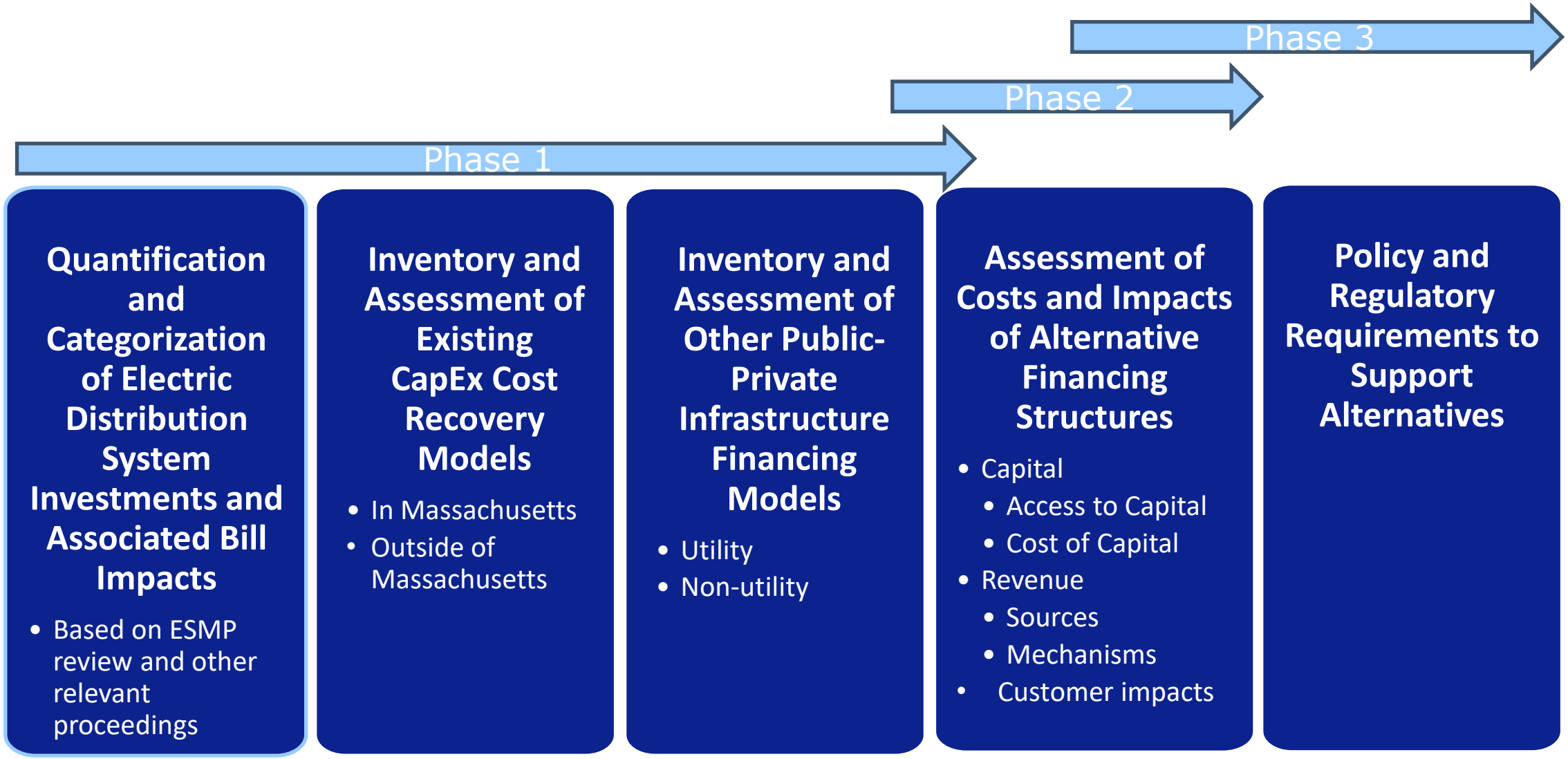
FTT: Issue Overview and FAWG Mission

- Relying on electrification to decarbonize Massachusetts' total economy will require major investment in distribution system infrastructure.
- Investments in the electric distribution system to enable electrification and clean energy deployment are expected to increase over the next two decades, with the state's electric distribution company's projecting a near-term incremental $5+ billion in investment between 2025 and 2029 – this number will likely be even larger for the next five year period (2030 – 2034)
- Currently, the primary financing mechanism for these investments is collecting revenue from electricity customers via utility bills.
- Energy efficiency and other programs have helped mitigate bill impacts from prior grid modernization investments, even as such investments have increased.
- The pace of needed investment growth over the coming decades has the potential to significantly outpace previous growth rates, with the potential to put upward pressure on electricity bills beyond historical levels (even as electricity sales levels increase with electrification).

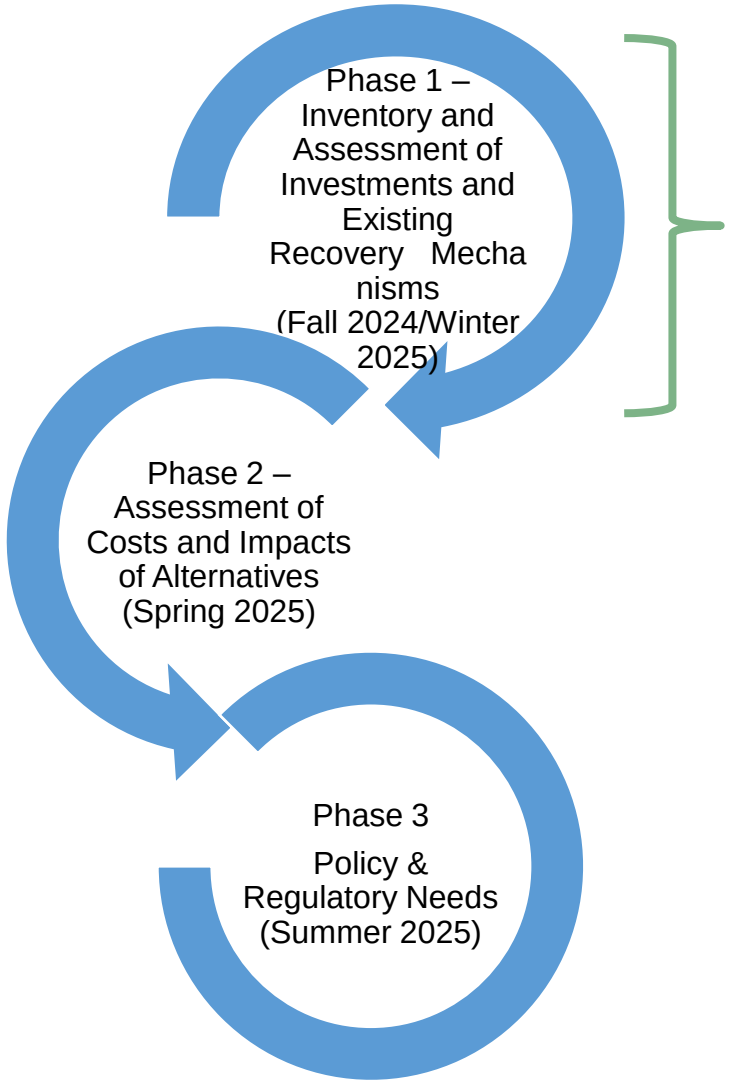
FTT FAWG Mission

To identify alternative mechanisms to finance/fund EDC distribution system infrastructure upgrades necessary to achieve the Commonwealth's clean energy and climate mandates that mitigate the cost impacts of the energy transition on consumers' electricity bills, and provide affordable, sustainable, and timely sources of revenue to support needed investment.

Proposed FTT Workstreams



FTT FAWG Workstream – Phase 1 Focus and Proposed Timelines



Investment Needs and Costs

- Projections as identified in each EDC's ESMP and other relevant proceedings.
- Broad characterizations of types of investment vis-à-vis decarbonization goals.
- Comparison to other states.

Recovery Mechanisms

- Current cost recovery mechanisms in Massachusetts.
- Recovery mechanisms in use/under consideration in other states.

Review of Other Financing Options

- Public-private infrastructure partnerships (utility and non-utility).
- Industry restructuring.

Phase I - Planned Meetings

- **October 21** – FAWG Launch Webinar (today) – primer on electric industry and ratemaking for regulated utilities
- **November/December 2024** – FAWG zoom/in-person to discuss overview of utility investment plans and customer bill impacts associated with expected investments over next five years and current state of cost recovery
- **January 2025** – FAWG zoom/in-person to review electric distribution-system financing approaches used or being considered in other jurisdictions
- **February 2025** – FAWG zoom/in-person to discuss and review update to Advisory Board and close out Phase 1
- **March 2025** – Update Energy Transformation Advisory Council on FTT Working Group efforts

APRIL 2025 – LAUNCH PHASE 2

Next Steps

- Sign up if you would like to participate in the Financing the Transition FAWG
    - A link is provided in the chat and will be on the Office of Energy Transformation website
- Review the Bylaws, Ground Rules, and approved workplans available on the Office of Energy Transformation website
- Registration to participate will close on October 28th
- Confirmation will be sent by November 6th
- The first convening of the FAWG will be in late-November

Adjourn

Thank you!