

Boston Grid Modernization

Opportunities To Support Electrification, Decarbonization, and Resilience

A report on the Boston Green Ribbon Commission's meeting series

Discussions facilitated by Janet Gail Besser and Dr. Jonathan Raab



Executive Summary

Introduction

The electrification of buildings and transportation is a key strategy to achieve climate goals set by the Commonwealth of Massachusetts, the City of Boston, and many other private and non-profit enterprises, organizations, and residents. As a result, in Boston, electricity consumption and demand is growing rapidly. The magnitude of the increase will be affected by how successful the City, the utilities, large energy users, and other customers are in ensuring energy-saving retrofits result in an efficient electrified building stock, and how the electric vehicle charging infrastructure is designed. Eversource modeling shows the City of Boston's current electricity demand more than doubling by 2040 and almost tripling by 2050. Changes in the electricity load profile, or timing of electricity demand, would also occur, including increases in peak demand (affected by energy efficiency measures and demand response initiatives) and timing as peaks shift from the summer for cooling to the winter for heating.

To respond to increasing electricity consumption and changing patterns of usage, as well as aging grid assets, utilities are undertaking substantial grid modernization initiatives, which are largely overseen by state regulators. However, to succeed in these initiatives, utilities need accurate information about customer plans for electricity use as inputs to their system planning, especially as customer electrification actions will increasingly influence how and how much electricity is used and needs to be delivered reliably through the grid. Customers also need information about utility plans to invest in grid infrastructure, because without confidence that the local grid can accommodate increased demand, building owners, vehicle electrification providers and customers

will be reluctant to commit to electrification investments. Moreover, communities and neighborhoods where new grid infrastructure will need to be built will want to see its impact minimized and equitably distributed. They will also want to understand how utilities have considered alternatives. This is especially the case in historically burdened Environmental Justice¹ neighborhoods. Support or opposition to infrastructure from the City of Boston and affected neighborhoods can affect its timing and cost. In addition, current regulatory frameworks and financing models may not work or may be too slow to accommodate the pace of infrastructure investment needed.

Objective: Identifying Opportunities to Support Electrification, Decarbonization, and Resilience

The objective of the Green Ribbon Commission's (GRC) Boston Grid Modernization Meeting Series was to identify how key actors—including Eversource and other utilities, the City of Boston, and large energy users—can work together to identify opportunities for positive action to modernize Boston's electricity grid to advance electrification, decarbonization, and resilience. A key element of taking advantage of these opportunities will be transforming and better coordinating their respective infrastructure investment, planning and implementation processes. While not addressed directly, the costs of the infrastructure investments that will be needed are an additional important consideration. Better coordination, planning and implementation processes will help to manage the financial implications of these investments.

¹ Environmental Justice communities and neighborhoods have been defined as a neighborhood or community, composed predominantly of persons of color or a substantial proportion of persons below the poverty line, that is or has been subjected to a disproportionate burden of environmental hazards and/or experiences a significantly reduced quality of life. (New Mexico Department of Health) The US Environmental Protection Agency defines the optimized state of environmental justice as "the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income, with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies."

Process

The Green Ribbon Commission proposed an initial set of three meetings to address members’ concerns about the impacts of electrification on the grid, including hosting capacity and the City of Boston’s Equitable Electrification initiative. Meeting participants included large energy users whose electricity uses include a variety of building, transportation, and infrastructure needs, as well as the City and the three major utilities (Eversource, National Grid, and Vicinity). All of them were members of the Green Ribbon Commission. The organizations that participated in this process can be seen below in Table 1, and the list of representatives from each participating organization can be found in [Appendix B](#). The meetings were professionally facilitated and supported by Janet Gail Besser and Dr. Jonathan Raab as well as the GRC staff.

The goals of the three meetings were to:

- 1. Achieve greater understanding of each other’s current plans and planning processes;**
- 2. Identify areas where improvement is needed and collaboration or constructive change would yield benefits for all; and**
- 3. Structure ways to work together to improve planning and implementation for better outcomes.**

The Green Ribbon Commission meeting series was intended to provide a high-level framing of these strategic issues and, depending on their outcome, set the stage for future work on specific aspects of the City’s, utilities’ and large energy users’ electrification strategies, including, potentially, building electrification and vehicle charging, grid infrastructure siting, and the role of distributed energy resources (DER).

Table 1: Organizations Participating in GRC Grid Mod Meetings

Arup	Mass General Brigham
Beacon Capital Partners	MIT
Boston Medical Center	Museum of Science
BXP (formerly Boston Properties)	National Grid
Boston University	New England Aquarium
City of Boston	Northeastern University
Equity Residential	Turner Construction
Eversource	UMass Boston
Harvard University	Vicinity

Meeting One – Level setting: building common understanding of future grid needs in boston

The first meeting was structured as a joint fact-finding exercise to develop a common understanding of the goals and requirements for electrification and clean energy for the City of Boston and large energy users, as well as the current state of utility distribution system planning and investment to support these goals and requirements in Boston. This meeting included detailed presentations from the City of Boston, three large energy users (representing the education, real estate, and health care sectors), and Eversource.



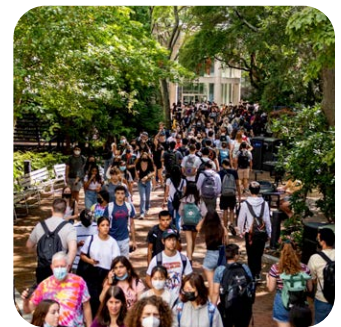
Meeting Two – Identifying opportunities for improved planning and coordination

The second meeting focused on identifying and grouping potential opportunities for improved planning, coordination, and implementation related to grid modernization to support electrification, decarbonization, and resilience in Boston. The planning processes for Eversource, the City and representative large energy users were mapped in a spreadsheet that was used to identify points of intersection for improved coordination and input, who the key actor(s) should be for each step, when and how often that coordination and input should occur, and potential areas for improvement. This meeting included structured brainstorming and the use of break-out sessions.



Meeting Three – Structuring ways to work together to improve planning for better outcomes

At the third session, the group explored the highest priority points of intersection and opportunities for further work on coordination and collaboration, chosen from those identified in the second meeting. They included: 1. Coordinated/Integrated Planning; 2. Community Energy Transformation Visioning Process;² and 3. Site Selection and Technology Options. Presentations from a large energy user, the City of Boston, and Eversource served as conversation starters on these priority points of intersection and opportunity. Participants discussed approaches for next steps and future work.



High level summaries and key points from each of the three meetings can be found in [Appendix A](#).

² The Community Energy Transformation Visioning Process is an idea that was raised in Meeting Two and further developed in Meeting Three. It is discussed in greater detail in Appendix A, Item 2.

Insights and Potential Next Steps

The third meeting concluded with a discussion of key insights from the three-meeting series. Participants discussed potential next steps including the need for continued discussions on these topics and what the role of the GRC might be. Finally, the group discussed the importance of including state regulators and policymakers as needed / appropriate, as well as community leaders and local organization representatives.

None of the participants disagreed that further collaborative work on issues related to Boston grid modernization was essential, or that the GRC should consider what ongoing role it can play. The participants also supported focusing future meetings on the three key topic areas identified in the Meeting Two mapping process and expanded upon in Meeting Three:

Coordinated and Integrated Planning – with the GRC potentially facilitating the establishment of a process for timely information and data exchange to improve planning and implementation outcomes.

A Community Energy Transformation Visioning Process, probably led by the City, in partnership with the utilities, large energy users, and community leaders.

- An energy education, communications and messaging process that is open to new ways of sharing information would be a central component of this effort.
- Key messages should explain:
 - How electrification of buildings and transportation is needed to reduce reliance on fossil fuels and achieve decarbonization.
 - How electricity demand will increase as a result of electrification and expected building development, which together are estimated to more than double the electricity used in the City of Boston by 2040 and almost triple it by 2050.
- How DER (including energy efficiency, distributed generation, and other DER) should be used to help meet the City's and customers clean energy and decarbonization requirements and reduce the amount of new grid infrastructure where feasible.
- How grid modernization, which will include substantial new infrastructure, is essential to enable electrification and support the Citywide clean energy and decarbonization requirements.
- The processes, including all communications, should be transparent, easily understandable, and make information and data readily accessible.
- The Community Energy Transformation Visioning Process should complement and be coordinated with the integrated planning for and the siting of needed infrastructure.

Improving grid infrastructure **Site Selection and New Technology** adoption processes, involving the utilities, the City, large energy users, and neighborhoods.

- Reform utility processes for identifying and developing specific sites in collaboration with affected stakeholders.
- Minimize impacts of siting grid infrastructure in affected communities (e.g., visual impacts, co-locating with other infrastructure or development), while coupling grid infrastructure with clean energy opportunities in affected communities.
- Review regulatory and permitting processes to educate and inform communities and other stakeholders and to identify opportunities to streamline them to enable more timely development; engage the Department of Public Utilities and Energy Facilities Siting Board, and other permitting officials as appropriate.

The Participants discussed the possibility of having some type of ongoing GRC Grid Modernization Working Group that would meet regularly (e.g., three or four times per year). It could work on certain key topics while serving as an accountability forum to ensure that other key aspects of the recommended actions move forward. The Participants talked about having the Working Group potentially supported by sub-groups on key topics (with the sub-groups either led and managed by the GRC or by others (e.g., the City or Utilities). Some of the potential topics for the Working Group or others to lead that were considered during the third meeting include:

Planning Information Sharing Protocols—including potentially protocols for tri-lateral (Utilities, Large Energy Users, City of Boston) clean energy, electrification, and grid infrastructure related information sharing.

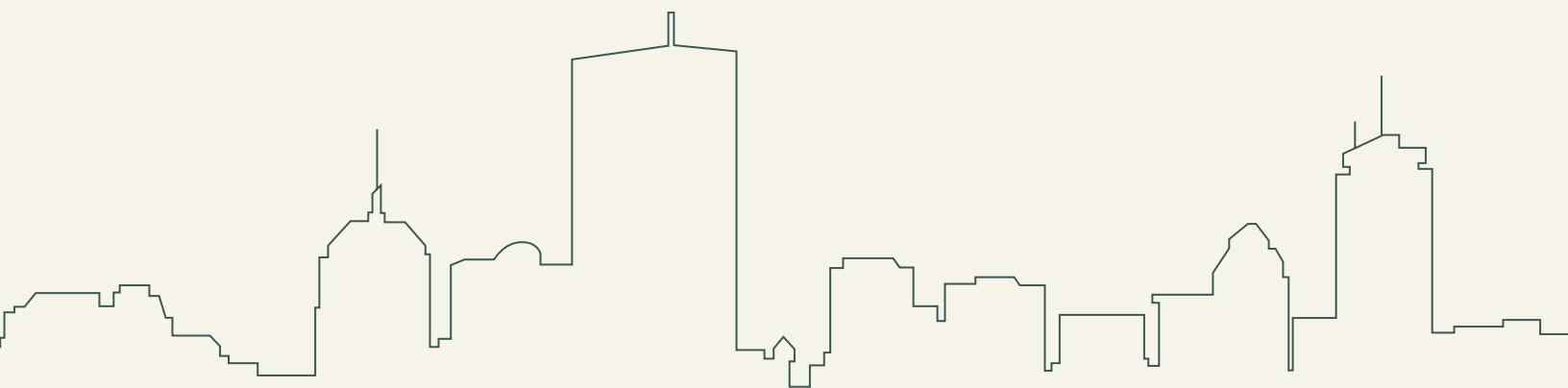
City of Boston Energy Transformation Visioning processes—Develop both Citywide and neighborhood-specific visioning processes. The City could lead this with a sub-group of utilities, large users, and invite community and NGO leaders. This sub-group could also tackle some of the common messaging and background education work.

Neighborhood Infrastructure Siting Process—Develop improved processes for working with neighborhoods on identifying appropriate sites, coupling both site-related co-benefits and broader community targeted clean energy initiatives.

Policy and Regulatory Reform—What policy and regulatory changes are needed at the state and city level to facilitate accelerated infrastructure implementation? This could include GRC members and invited state agencies, and community and NGO leaders.

Workforce Issues—address workforce training and shortage issues for clean energy and grid modernization.

The GRC will be pursuing further discussions with its members regarding next steps.



Appendices

Appendix A: High Level Summaries & Key Points From Each Meeting

Meeting One – Level setting: building common understanding of future grid needs in Boston

The first meeting focused on the current processes, priorities, and plans for electrification, decarbonization and resilience, and related infrastructure investment, of large energy users, the City of Boston, and Eversource. Discussion centered on the electricity demand impacts of increasing electrification of buildings and transportation, the consequent need for investments in grid infrastructure, the timeliness of this investment, the role of distributed energy resources (DER), the equity and environmental justice implications of infrastructure investment and electrification, and the need for better communication and coordination. See the agenda and links to the presentations in [Appendix C](#).

Key themes that emerged from the Meeting One presentations and discussions include:

City, state, federal and customer clean energy and decarbonization mandates, goals and objectives are driving action toward increasing electrification of buildings and transportation.

Implementing electrification initiatives and other building/facility capital investments will more than double City of Boston electricity demand from a 1.7 GW summer peak to a 3.7 GW winter peak between now and 2040, and almost triple demand to 4.7 GW by 2050.³

- These increases will result from new electric end-uses (heating, cooling, transportation), as well as new development, and are projected to increase overall electricity use even with deep deployment of energy efficiency to minimize electricity peak demand and consumption.

The growth in electricity demand and consumption will necessitate significant investments in grid infrastructure to deliver supply as well as integrate customer investments in renewable and storage technologies. Eversource estimates that grid infrastructure needs may include:

- Up to 10 additional bulk substations,
- An additional 30 bulk transformers,
- Approximately 100+ additional distribution feeders of various voltages.⁴

Concerns centering on timing,⁵ location and cost include the timely availability of electricity supply and grid capabilities where and when they will be needed to ensure continued reliable and resilient electricity supply and delivery.

³ Boston Grid Modernization Meeting Series, Meeting One slide deck, p. 71; Eversource email communication.

⁴ Boston Grid Modernization Meeting Series, Meeting One slide deck, p. 75.

⁵ Recent experience is that planning and construction of substantial new infrastructure can take up to 10 years or more.

Appendices (continued)

| In addition,

- The City is concerned about the equity and environmental justice implications of new investments in grid infrastructure, particularly with respect to locations and siting (e.g., as indicated in its Equitable Electrification strategy and Green New Deal). Others share the concern about equity and environmental justice.
- The City and others also want to make sure that all non-wires⁶ alternatives (e.g., DER) are examined and integrated into any grid infrastructure plans.
- Large energy users are concerned that necessary supporting grid infrastructure will not be in place when needed, and that interconnection of any DER they pursue will not occur in a timely fashion and at reasonable cost.
- Eversource is concerned about the ability to site and permit new infrastructure in locations and on schedule that is in sync with increasing demand.

| All participants noted the value and necessity of increased communication, coordination, input, and partnership with respect to each other's electrification and decarbonization plans:

- To ensure that building and facility projects (both new and retrofit), and grid infrastructure investments can proceed in a timely manner,
- To take into account what each entity is planning to do,
- To address siting concerns, and
- To engage host and other affected communities and neighborhoods in developing and supporting options/solutions to meet increasing clean energy and infrastructure needs.

Meeting Two – Identifying Opportunities for improved planning and coordination

The second meeting focused on mapping the planning and implementation processes for Eversource, the City of Boston and large energy users to identify where improved coordination and input is needed among them. Specifically, the exercise centered on identifying where coordination and shared input could be improved, who should be included, and how frequently they should be consulted. Separate breakout groups discussed Eversource's infrastructure planning and implementation processes, the City's Green New Deal and Equitable Electrification goals and initiatives, and representative large energy users' infrastructure, climate and sustainability plans.

The Meeting Two agenda and links to summary tables based on worksheets for Eversource, the City of Boston, and large energy users that were discussed during the meeting can be found in [Sub-Appendix A](#).

Drawing from the discussions of the Eversource, City of Boston, and large energy users plans and processes, the meeting participants identified three key areas where improved coordination and input are needed to ensure that grid modernization supports Boston's electrification, decarbonization and resilience goals. The areas that emerged across the discussions include:

1. Coordinated and Integrated Planning

2. A Community Energy Transformation Visioning Process

3. Site Selection and Technology Options

⁶ Early in the meetings, participants referred to non-wires alternatives to grid investment, which implied an either/or choice. This evolved to discussing the opportunity that new grid infrastructure could present for additional headroom for DER integration and broader community decarbonization investments.

Appendices (continued)

1. Coordinated and Integrated Planning and Implementation is needed among the utilities (electric, gas and steam), large energy users and the City of Boston. Without awareness of each other's plans and the opportunity, if not the requirement, to provide input at critical points, realization of a modernized grid that can support electrification, decarbonization and resilience will be at risk.

Specifically, planning processes need to be improved by ensuring that:

- Input is provided, information is shared, planning is integrated, and implementation is coordinated across relevant City energy and infrastructure projects (e.g., Dorchester Avenue, Codman Square), large energy users' master capital plans and major renovations, and utility energy and infrastructure initiatives/projects
 - Information should include organizations' (the City and energy users) plans for behind-the-meter (BTM) DER, building and transportation electrification so that utilities can account for “non-wires” or “non-pipes” alternatives to infrastructure they would otherwise build.
- Demand forecasting takes into account
 - Forecasts of potential BTM non-wires (and non-pipes) alternatives
 - Large energy users' electrification plans
- Data and information access is provided to the City and energy users regarding
 - Insight into distribution and transmission system hosting capacity
 - The DER interconnection queue
 - Insight into the grid's capacity to handle increased electrification
 - Customer consumption and demand data
 - Carbon emissions data associated with generation and supply

2. Participants in the meeting identified the need for what they termed a citywide **Community Energy Transformation Visioning Process** to educate the general public and residents in all neighborhoods, including historically burdened Environmental Justice communities, about the energy transformation. This transformation is required to achieve Boston's, large energy users' and other customers' electrification, decarbonization, and resilience goals and help them understand the nature and magnitude of the infrastructure that will be required and the benefits that will accrue. The Community Energy Transformation Visioning Process should also provide all members of the community with the opportunity to provide input to and feedback on the City's, the utilities' and large energy users' infrastructure development plans, and what their neighborhoods would want. There was also discussion about enabling community decarbonization plans, particularly for communities and neighborhoods that would be hosting new grid infrastructure.

Specifically, a Community Energy Transformation Visioning Process is needed to:

- Provide education about and solicit input and feedback on the energy transition, including:
 - Energy literacy education and training
 - Clean energy and electrification goals and requirements of the City (including large energy users, neighborhoods, and citizens)
 - Enable understanding of community and neighborhood needs and desires
 - Needs for supportive grid infrastructure across the entire City
 - Infrastructure co-benefits across the City, with attention to historically burdened Environmental Justice communities (including resilience, creation of headroom for additional DER/non-wires opportunities, and support of decarbonization plans)

Appendices (continued)

3. The Site Selection and Technology Options process should be improved to elicit support for the specific infrastructure investments that will be needed to realize the City's and customers' electrification, decarbonization and resilience goals in a timely manner. Current infrastructure siting approaches and permitting processes take too long and are often delayed or do not proceed due to opposition of the host community, the City, or both.

These approaches and processes can be improved by:

- Aggregating or clustering grid infrastructure development across the City to provide a comprehensive view rather than approaching each project (e.g., sub-station) separately.
- Evaluating front-of-the meter non-wires alternatives to defer distribution (and transmission) upgrades (e.g., battery energy storage systems (BESS) at substations).
- Providing information about how any potential infrastructure can provide benefits to the host community (e.g., resilience, increased capacity to accommodate BTM non-wires alternatives and clean DER)
- Improving working relationships among the utilities and community stakeholders to increase trust
- Co-locating grid infrastructure with other infrastructure (e.g., water) and development to reduce construction disruption.
- Improving the aesthetics of infrastructure design.
- Providing appropriate benefits / compensation to the host community.
- Revising permitting processes to be creative and flexible enough to consider the critical subset of infrastructure needs (e.g., a substation) in the context of longer term plans that are part of a broader portfolio of infrastructure.

In addition to the key areas of Coordinated and Integrated Planning, a Community Energy Transformation Visioning Process, and Site Selection and Technology Options, other challenges that need to be addressed were raised, noted, and tabled for future discussion and potential work. These include questions around financing and planning for transformative electrification in Boston; how transmission into Boston will develop; how Boston's goals and plans must interact with state and regional policies; how a workforce with sufficient skills and size can be assembled to implement the transition needs; and how the general consumer-level understanding of electrification can be increased through education.

The group identified three specific topics where further education and work would be valuable and could take place as part of the Community Energy Transformation Visioning Process or other venues. These areas include:

- **Cost allocation** and how to fund the overall cost of electrification are critical issues that should be prioritized. The group identified a near term need for education and potentially regulatory policy reform regarding who pays for what types of grid infrastructure investments. Potential regulatory reform of cost allocation would likely ultimately end up before the Department of Public Utilities (DPU).
- **Electricity rate structures/designs and pricing** in a just way with special consideration to supporting electrification goals, the landlord/tenant challenges to efficiency and other DER investments. Cost allocation would also likely ultimately end up before the DPU.
- **Green jobs and workforce development** to deliver the infrastructure and clean energy projects that will be needed in a timely manner. This could be addressed in a separate GRC committee or process related to workforce issues.

Appendices *(continued)*

Meeting Three – Structuring ways to work together to improve planning for better outcomes

Meeting Three focused on the three topics identified in Meeting Two as areas for improved coordination and input: Coordinated and Integrated Planning, a Community Energy Transformation Visioning Process, and Site Selection and Technology Options. To begin the conversation on each topic, a large energy user, Eversource, and/or the City made short presentations that illustrated the need for and offered examples for process improvements. Discussion among meeting participants identified further related opportunities for improvement and suggested potential ongoing work. See the agenda and links to the presentations in [Appendix D](#).

Coordinated and Integrated Planning

A large energy user and the City described plans they each had underway that illustrated the need for improved Coordinated and Integrated Planning. The large energy user is undertaking a campus decarbonization effort that is projected to lead to a significant increase in electricity demand (approximately 200% from 2021-2061). Similarly, the City described a project (the Dorchester Avenue “Corridor”) that could include 15 million square feet of development. These projects are examples of large energy user and City plans that would have a significant impact on electricity grid infrastructure in the future. Early sharing of information about these initiatives could improve Eversource’s (and other utilities’) forecasting and planning and thereby enhance the likelihood that utility infrastructure will be in place to enable and support these projects.

In the discussion that followed, participants identified the following areas where improved coordination and input are essential to improve outcomes:

- Need to share information very early in each entity’s planning processes to better understand large customers, host communities/neighborhoods, and utility planning.
- Need to synchronize efforts between new project development and existing infrastructure, including potential upgrades to it. There is no time for uncoordinated parallel processes.
- Essential to have all (electric, gas and steam) utilities at the table.
- MOUs between the utility, the City and customers could provide a framework for improved planning coordination.
- Need to plan broadly (city-wide or “cluster” analysis, e.g., identify need for several substations at once) to understand the overall impacts (see Community Energy Transformation Visioning) and facilitate implementation (see Siting and Technology Options).

Community Energy Transformation Visioning Process

One of the ideas that came out of Meeting Two was developing a Community Energy Transformation Visioning Process to co-develop and communicate a vision of clean energy, electrification and grid modernization and the decarbonization, resilience, and other benefits that could result. In addition to co-developing and communicating the need for and benefits of such a transformation, the process would also delineate the roles the City, Eversource, other utilities, large energy users, and communities and neighborhoods need to play during the transformation. Participants identified the City as the entity to lead this effort, with the City emphasizing that it could only succeed in partnership with the utilities, large energy users and others.

Appendices *(continued)*

In the discussion, participants particularly emphasized the need for education and access to information, taking a broad view of needs across the City and over time, and community engagement. Specifically, they identified the following items as important to achieving successful outcomes:

- Education, Access to Information, and Messaging
 - Conduct “energy literacy” education and training, including the City’s decarbonization and clean energy goals and mandates, and related need for substantial new grid infrastructure to meet these goals and mandates.
 - Provide information on the reasoning behind, and the benefits and tradeoffs of infrastructure choices in an easy-to-understand form, as well as the practicalities of permitting and other regulatory processes.
 - Use quantitative metrics where possible to relate projects to overall goals (e.g., this infrastructure will make a certain amount of progress toward decarbonization).
 - Focus on consistent messages to communicate the information the members of the general public say they want and need.
- Broad and Long-Term Perspective
 - Take a broad look at infrastructure needs across the City (e.g., new substations and distribution infrastructure in every/many neighborhoods), as well infrastructure needed to bring additional electricity into the City (e.g., transmission infrastructure).
 - Identify the likely types and quantities of grid infrastructure needed throughout the City over the next decade or two, in line with City and large energy user goals for electrification and decarbonization.
- Community Engagement
 - A multi-stakeholder effort that includes community leaders in a transparent decision-making process.

- Leverage local expertise regarding neighborhood desires and needs (e.g., where to locate EV charging and new grid infrastructure).

Site Selection and Technology Options

Decisions about Site Selection and Technology Options are central to Boston’s grid modernization. The City and large energy users discussed the need for improvement in the utilities’ processes for assessing sites for distribution (and transmission) infrastructure, how they choose between wires and non-wires alternatives, and how they could better engage communities regarding site selection and development. Concerns raised included both the impacts on host communities and neighborhoods and the timeliness of infrastructure development to support electrification and decarbonization.

Eversource described its process for siting a new Hyde Park substation and a battery energy storage system (BESS) to address the increasing needs, both locally and in bordering neighborhoods, as an example. Participants discussed how the decision about an individual substation fit into the City’s overall plans. They highlighted needs for better communication and engagement with host communities. Specifically, they identified the following items as important to achieving successful outcomes:

- The need for any grid infrastructure (e.g., substations) should tie into the broad overall City equitable electrification and decarbonization plans.
- Consider several substations at a time, rather than only the next substation, so that everyone understands that investment is needed “everywhere” and everyone is affected.
- Layer in all utility impacts, identifying the integrated utility infrastructure and development burden on the community, and co-locating infrastructure where possible.
- Consider multiple location options in consultation with the affected communities, including both property owned by the utilities and City, as well as other property where long-term easements are possible.

Appendices *(continued)*

- Couple discussions on specific infrastructure needs in a community with potential clean energy opportunities, and other benefits (reliability, resilience).
- Locate and design grid infrastructure to minimize adverse impacts on communities including visual impacts.
- Identify regulatory and policy changes that would enable the process of developing infrastructure to move more quickly while still incorporating local input.
 - Review of the design process (when to consider aesthetics, e.g., façade design),
 - Investment planning and cost recovery,
 - Change regulatory requirements for data, considering the probabilities of needs in planning longer term, as well as current actual data.

Appendix B: Participating Organizations and Their Representatives

Brian Swett, Geoff Gunn	Arup
Al Scaramelli, Molly McGovern	Beacon Capital Partners
Cory Pouliot, James Kidd	Boston Medical Center
Ben Myers, Neetu Siddarth	Boston Properties
Derek Howe, Dennis Carlberg, Elijah Ercolino, Sonia Richards	Boston University
Mariama White-Hammond, Bradford Swing, Alison Brizius, Travis Anderson	City of Boston
Dan Egan, Rebecca Becker	Equity Residential
Penni Conner, Aftab Khan, Digaunto Chatterjee, Tilak Subrahmanian, Maija Benjamins, Erin Engstrom	Eversource
Jaclyn Olsen, Rebecca Hatchadorian, Heather Henriksen	Harvard University
Dennis Villanueva, John Messervy, Jason Dantona	Mass General Brigham
Joe Higgins, Julie Newman	MIT
David Sittenfeld	Museum of Science
Melissa Lavinson, Carol Sedewitz	National Grid
Ferris Batie	New England Aquarium
Joe Lalley, Leah Bamberger, Jacob Glickel, Torrey Spies	Northeastern University
Pete Hamill, Rick Sgro, George Gaughan	Turner Construction
Bob Chen	UMass Boston
Matt O'Malley, Pat Gillooly	Vicinity

Appendix C:

Meeting One Agenda and Links to Presentations

Boston Grid Modernization Meeting Series

Meeting One – Level setting: building common understanding of future grid needs in Boston

April 24, 9:00 am – 1:00 pm

Time	Topic	Description
8:30	Arrival	Coffee and Light Breakfast
9:00	Welcome	- Meeting goals, structure, and ground rules - Review agenda
9:15	City of Boston Presentation	- Clean energy, climate, and resilience goals - Equitable Electrification strategy, BERDO, and DER plans - How improved grid planning can support the City goals
10:00	Large Energy User Presentations Boston University Boston Properties Mass General Brigham	- Approach to decarbonization planning and capital investments including electrification and DERs - Need for grid planning predictability and investments to support decarbonization investments
10:45	Break	
11:05	Eversource Presentation	- High-level approach to grid planning and investment - Demand projections (including electrification and DERs) and impacts on grid design and investment - How distribution planning and investment needs to evolve to accommodate demand growth and decarbonization of Boston
12:20	Cross-Cutting Discussion	- Opportunities for improving grid planning, coordination, and investment in Boston - Next meeting approach - Next steps
1:00	Adjourn	

[Meeting 1 Presentation](#) – Password: GRC2023

Appendix D: Meeting Two Agenda and Links to Presentations

Boston Grid Modernization Meeting Series

Meeting Two – Identifying opportunities for improved planning and coordination

May 18, 9:00 am – 1:00 pm

Time	Topic	Description
8:30	Arrival	• Coffee and Light Breakfast
9:00	Welcome	• Introductions • Meeting Goals and Ground Rules • Introductions, agenda review
9:10	Review Eversource Input to Spreadsheet	• Digaunto Chatterjee • Maija Benjamins
9:30	Breakout Session #1 Improving Coordination and Input on Eversource's Grid Planning & Implementation	• Two groups. Both groups will: ○ Discuss where, and on what, better coordination and input are needed, including from whom and by when/how often. More information shared in Table 1.
10:30	Break	
10:45	Report Back Improving Coordination and Input on Eversource's Grid Planning & Implementation	• Report back from break-out groups • Discussion of similarities and differences from break-outs, opportunities for improvement, and where more details are needed (e.g., at next meeting and beyond)

Appendix D: Meeting Two Agenda and Links to Presentations *(continued)*

Boston Grid Modernization Meeting Series

Meeting Two – Identifying opportunities for improved planning and coordination

May 18, 9:00 am – 1:00 pm *(continued)*

11:15	Breakout Session #2	Two groups. Both groups will discuss where, and on what, better coordination and input are needed, including from whom and by when/how often
	Improving Coordination and Input on A) City of Boston’s Decarbonization Initiatives; and B) Large Energy Users Climate & Sustainability Plans	- Group A will focus on the City of Boston, using input received from their homework assignment. More information shared in Table 2. - Group B will focus on Large Energy Users, using input received from their homework assignment. More information shared in Table 3.
12:10	Break	
12:20	Report Back Improving Coordination and Input on A) City of Boston’s Decarbonization Initiatives; and B) Large Energy Users Climate & Sustainability Plans	- Report back from break-out groups - Discussion of opportunities for improvement and where more details are needed (e.g., at next meeting and beyond)
12:50	Wrap Up and Next Steps	- Highlights from today’s meeting - Next meeting approach - Next steps
1:00	Adjourn	

[Meeting 2 Presentation](#) – Password: GRC2023

Appendix D:

Meeting Three Agenda and Links to Presentations

Boston Grid Modernization Meeting Series

Meeting Three – Structuring ways to work together to improve planning for better outcomes

June 16, 9:00 am – 1:00 pm

Time	Topic	Description
8:30	Arrival	Coffee and Light Breakfast
9:00	Welcome	- Introductions - Meeting Goals & Ground Rules - Agenda review
9:10	Coordinated/Integrated Planning Parties & Information Types - Relevant City energy infrastructure programs; - Utility energy infrastructure initiatives/projects; - Large energy users' master capital plans and major renovations, including behind-the-meter (BTM) non-wires alternatives Demand forecasting - Incorporate all potential BTM non-wires alternatives - Coordinate with / incorporate large energy user electrification plans Data/information access - Insight into hosting capacity and interconnection queue - Electrification capacity insight - Consumption and demand data - Carbon emissions data Examples/Conversation Starters <i>Northeastern:</i> Capital investment and electrification plans, and when do they need to exchange info with Eversource and City	- Moderated Group Discussion - Joe Lally - Jacob Glickel - Travis Anderson - Moderators & Group

Appendix D: Meeting Three Agenda and Links to Presentations *(continued)*

Boston Grid Modernization Meeting Series

Meeting Three – Structuring ways to work together to improve planning for better outcomes

June 16, 9:00 am – 1:00 pm *(continued)*

	○ City – one or two of most important places where (and when) they need to exchange info with Eversource and large users Summary/Potential Next Steps	
10:15	Break	
10:25	Community Energy Transformation (Envisioning) process Education about/Feedback on the Energy Transition ● Needs for supporting infrastructure ● Clean energy and electrification enablement ● Infrastructure co-benefits (including resilience) ● Non-wires opportunities Example/Conversation Starter: ○ City: Leading a process on developing / communicating vision of electrification and grid modernization; community engagement; and the role of City; communities and neighborhoods; Eversource; and large users Summary/Potential Next Steps	● Moderated Group Discussion ● Alison Brizius ● Moderators & Group
11:15	Break	

Appendix D: Meeting Three Agenda and Links to Presentations *(continued)*

Boston Grid Modernization Meeting Series

Meeting Three – Structuring ways to work together to improve planning for better outcomes

June 16, 9:00 am – 1:00 pm *(continued)*

11:30	Site Selection and Technology Options ● Couple any potential infrastructure, w/explanation of all the benefits (resilience, more headroom for additional non-wires) ● <i>Front of the meter non-wires alternatives</i> to defer distribution (and transmission) upgrades (e.g., Battery Energy Storage Systems (BESS) at substations) ● Targeted neighborhood benefits (including clean energy) ● Co-locating infrastructure and appropriate benefits/compensation ● Permitting – too long, and not creative/flexible enough to consider critical subset of infrastructure needs (e.g., substation) in context of longer-term plans Example/Conversation Starter: Siting a Substation ○ Eversource: Hyde Park Substation and BESS siting Summary/Potential Next Steps	● Digaunto Chatterjee ● Maija Benjamins ● Moderators & Group
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Appendix D: Meeting Three Agenda and Links to Presentations *(continued)*

Boston Grid Modernization Meeting Series

Meeting Three – Structuring ways to work together to improve planning for better outcomes

June 16, 9:00 am – 1:00 pm *(continued)*

12:30	Wrap Up: Where Do We Go From Here? Potential Next Step Options • Future Structure: Umbrella group w/sub-groups, or two or more independent groups? • Formalizing the improved processes (e.g., MOUs) • Other participants (e.g., regulators)? • Convener(s): Who hosts/leads? • Funding: Is funding needed? What are options? Final Report • Feedback on Report • Confidential information • Recipients/audience in addition to participants? Other?	• Amy Longsworth • Moderators & Group
1:00	Adjourn	

[Meeting 3 Presentation](#) – Password: GRC2023