GMAC MEETING BACKGROUND:

DISTRIBUTION INTERCONNECTION

GMAC
Grid Modernization Advisory Council

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BACKGROUND

ACHIEVING STATE CLIMATE GOALS AND THE FUTURE GRID

Massachusetts' 2050 net zero emissions goal will require significant changes to the ways that people use electricity. For example, the majority of electricity supply will come from renewable sources. Additionally, increasing electrification of buildings and transportation will significantly increase demand for electricity.

INTERCONNECTION AND NEW LOAD CONNECTION

The connection of new energy resources, such as solar or battery storage, to the grid is called interconnection. When these resources are built, they must follow a specific interconnection process to ensure that they can safely connect to the grid. Similarly, the connection of new electric load, such as an EV charging station or a new building, is called new load connection. Because the grid is limited in how much energy demand it can meet, utilities must review new load requests to ensure that the grid can safely accommodate the increased load. Sometimes, interconnecting energy resources or connecting new load requires upgrades to the distribution system. This topic brief summarizes the process to connect new clean energy resources and new load to the grid, discusses key challenges, and highlights ongoing improvements to the interconnection processes.

The interconnection of new clean energy resources and the connection of new load is critical to achieve Massachusetts' climate goals.

OVERVIEW OF INTERCONNECTION PROCESS

ENERGY RESOURCE INTERCONNECTION

All new energy resources, from small residential solar to large battery systems, must obtain utility approval to interconnect. There are several steps to interconnecting a new energy resource to the distribution grid (See the process for Eversource and National Grid at the indicated links). First, the utility carries out a pre-application which identifies potential issues and grid constraints that would be caused by the customer's anticipated system. Next, the customer submits an interconnection application and appropriate documentation to officially begin the process. Once the application is reviewed, the utility constructs any necessary grid upgrades. The customer then builds the energy system, such as a solar array, and submits the certificate of completion to the utility. The utility reviews the certificate and associated documentation and allows the system to connect to the grid.

Sometimes, interconnecting customers, especially those with large interconnection requests, may be added to a group study which combines interconnection requests from many applications into a single study. These studies are subject to more detailed analysis.

NEW LOAD CONNECTION

New load connection has five primary steps. First, the customer reaches out to the utility to preliminarily determine if the grid can handle the estimated new load, if any grid upgrades are needed, and an estimate of the customer costs for these upgrades. To start the formal connection process, the customer submits a work order. Next, the utility enters an engineering and design phase in which the utility and customer ensure that the engineering plans for the new load are accurate and determine if grid upgrades are needed. Once the utility obtains any necessary permits, inspector approval to begin work, and customer payment, the utility begins construction. Finally, once the utility completes construction of the grid upgrade, the utility allows the customer to connect the new load to the grid.

CHALLENGES

Interconnection and new load connection processes are designed to ensure grid safety and reliability. However, these processes are often complicated, resource-consuming, long, and potentially costly. For example, the process to connect new load can take between several weeks and several years to complete, with an average time of about 40 weeks. This process has such a range of timing due to the variability of the size of new load, local requirements, and the ongoing national transformer shortage. The cost of necessary grid upgrades can also be a significant barrier to clean energy development and electrification.

IMPROVEMENTS AND ONGOING PROCESSES

Over the years, Massachusetts has implemented measures to address some of the challenges of interconnecting new energy resources. The Department of Public Utilities addressed long interconnection timelines in docket D.P.U. 11-75. It made further improvements to the interconnection process and directed the utilities and stakeholders to further investigate ways to reduce interconnection barriers in docket D.P.U. 19-55.

The Department opened D.P.U. 20-75 to address cost allocation challenges, among others. An outcome of this docket was the Provisional System Planning Program and associated Capital Investment Projects, which aim to address the challenge of prohibitive interconnection costs for large solar installations. Under the provisional program, all customers share the upfront interconnection costs. Future interconnecting customers refund ratepaying customers over time, based on their share of the needed upgrade.

FUTURE IMPROVEMENTS

As part of the Electric Sector Modernization Plan Phase 1 Order, the D.P.U. required that a long-term system planning process (LTSPP) stakeholder working group convene for six months and submit a final stakeholder report. The Department directed the LTSPP working group to discuss interconnection issues, particularly cost allocation of interconnection upgrades. The LTSPP stakeholders filed the required stakeholder report on May 9, 2025.

For new load connection, there is not currently a process comparable to the Capital Investment Projects, where all customers pay the upfront costs of grid upgrades and are reimbursed over time. However, these issues are being investigated by the Healey-Driscoll Administration and the Executive Office of Energy and Environmental Affairs.