

# Siting for a Cleaner, More Equitable Grid in Massachusetts

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## HIGHLIGHTS

*Siting decisions will be needed for the energy infrastructure required to accelerate the adoption of clean energy, the closure of fossil-fueled power plants, and the electrification of buildings and transportation. This analysis shows how past approaches to siting have resulted in an overconcentration of electricity infrastructure, notably polluting power plants, within or in close proximity to environmental justice neighborhoods. As the state advances changes to its siting process, those decisions must not replicate the failures of our current energy system, thereby overburdening already vulnerable populations. Key recommendations of the analysis address cumulative impacts, representation, and integration of the priorities of public health, environmental justice, and climate for siting decisionmaking.*

## Appendix: Methodology and Assumptions

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This appendix describes the methodology and assumptions used for developing the study *Siting for a Cleaner, More Equitable Grid in Massachusetts*, which analyzes and maps the proximity of existing and proposed energy infrastructure to environmental justice (EJ) neighborhoods to inform the development of new siting rules and regulations in support of a cleaner and more just electricity grid.

## Proximity Analysis

### GIS Mapping

We assessed the proximity of EJ populations to existing and proposed electricity generating units<sup>1</sup> (EGUs) and existing and proposed new substations in Massachusetts. Using geographic information systems (GIS) libraries in R, we conducted geospatial analyses to assess three indicators for each of these types of energy infrastructure facilities relative to the location of EJ populations<sup>2</sup> as defined by Massachusetts law (EEA 2022a). First, we assessed whether each facility is located or proposed to be located within an EJ census block group (“EJ neighborhood” in this analysis). Second, we assessed whether facilities not located or proposed to be located within an EJ neighborhood are within two separate distance bands of one and five miles of at least one EJ neighborhood. We used these locational criteria to create frequency tables of location status for these types of facilities.

### Data Sources

#### *Existing and Proposed Electricity Generating Units*

We used S&P Global<sup>3</sup> data for existing and proposed “utility-scale”<sup>4</sup> EGUs. For data processing, we aggregated as follows:

- **Other fossil fuels** include distillate fuel oil, kerosene, and oil.
- **Waste** includes landfill gas and municipal solid waste.
- **Biomass** includes biomass, biomass waste, and other biomass gas.

For proposed EGUs, we looked at projects with a listed status of “announced,” “advanced development,” or “construction begun.” Our focus was on projects equal to or larger than 35 megawatts (MW) to reflect changes included in state siting reform proposals (H.3187 and S.2113) from the current legislative session in Massachusetts. Those proposals would lower the threshold for review by the state’s Energy Facilities Siting Board to better account for peaker plants and other power projects with installed capacities below the current 65 MW threshold.

This dataset was generated in November 2023 and contains 1,044 existing units. For proposed new power projects, 11 of the 71 proposed generating units are equal to or greater than 35 MW.

#### *Existing Substations*

We used S&P Global data and Homeland Infrastructure Foundation-Level Data (HIFLD) for existing substations. This dataset was retrieved from S&P in June 2023 and contains 419 substations.

### *Proposed New Substations*

We looked at the proposed new electrical substations included in the Electric Sector Modernization Plans (ESMPs) of the state’s two largest utilities (Eversource 2024; National Grid 2024). Data in these plans name likely locations—within a city or two—for new substations but lack specific coordinates for these projects. To further refine this data to identify specific mapping coordinates, we examined the proposed new substations included in Eversource’s latest rate case, the utilities’ Local System Plans (LSPs), and information from additional online research (Eversource 2022, 2023; National Grid 2023).

This dataset was finalized in February 2024 and contains the coordinates of 11 proposed new substations (see Table A-1).

### *Environmental Justice Neighborhoods*

Geospatially referenced data on the location of environmental justice (EJ) populations in Massachusetts were obtained from the State of Massachusetts’s Executive Office of Technology Services and Security (EEA 2022b).

**Table A-1. Proposed New Substations Mapped**

	<b>ESMP, LSP, Rate Case</b>	<b>Title</b>	<b>Source for Coordinates</b>
1	ESMP and Rate Case, Eversource	New East Eagle Substation #131	<a href="https://www.eversource.com/content/business/about/transmission-distribution/projects/massachusetts-projects/mystic---east-eagle---chelsea-reliability-project">https://www.eversource.com/content/business/about/transmission-distribution/projects/massachusetts-projects/mystic---east-eagle---chelsea-reliability-project</a>
2	ESMP and Rate Case, Eversource	New Cambridge #8025 115kV/14kV Substation	<a href="https://www.eversource.com/content/residential/about/transmission-distribution/projects/massachusetts-projects/greater-cambridge-energy-project">https://www.eversource.com/content/residential/about/transmission-distribution/projects/massachusetts-projects/greater-cambridge-energy-project</a>
3	ESMP and LSP, Eversource	North Burlington Substation	<a href="https://www.eversource.com/content/residential/about/transmission-distribution/projects/massachusetts-projects/burlington-to-woburn-supply-initiative">https://www.eversource.com/content/residential/about/transmission-distribution/projects/massachusetts-projects/burlington-to-woburn-supply-initiative</a>
4	ESMP and LSP, Eversource	Greater Cambridge Energy Program	<a href="https://www.eversource.com/content/residential/about/transmission-distribution/projects/massachusetts-projects/greater-cambridge-energy-project">https://www.eversource.com/content/residential/about/transmission-distribution/projects/massachusetts-projects/greater-cambridge-energy-project</a>
5	LSP, Eversource	Weymouth Substation	<a href="https://heirp.com/">https://heirp.com/</a>
6	LSP, Eversource	Harwich/Orleans Substation	<a href="https://www.mass.gov/doc/efsb-02-2-final-decision/download">https://www.mass.gov/doc/efsb-02-2-final-decision/download</a> (page 28)
7	LSP, Eversource	Kingston Substation #735	<a href="https://www.eversource.com/content/docs/default-source/project-maps/carver-kingston-map.pdf">https://www.eversource.com/content/docs/default-source/project-maps/carver-kingston-map.pdf</a>
8	LSP, National Grid	New Snake Hill #2235 Substation	<a href="https://www.nationalgridus.com/massachusetts-solar/Phase-2/Carpenter-Hill-(Snake-Hill)-Charlton">https://www.nationalgridus.com/massachusetts-solar/Phase-2/Carpenter-Hill-(Snake-Hill)-Charlton</a>
9	LSP, National Grid	Relocate Adams Substation 23kV	<a href="https://www.iso-ne.com/static-assets/documents/2023/05/a02_2023_05_18_pac_adams_21_substation_relocation.pdf">https://www.iso-ne.com/static-assets/documents/2023/05/a02_2023_05_18_pac_adams_21_substation_relocation.pdf</a>
10	LSP, National Grid	Build Reynolds Ave. Substation	<a href="https://www.nationalgridus.com/media/construction-projects/pdfs/ne/boston/reynolds-ave/project-map.pdf">https://www.nationalgridus.com/media/construction-projects/pdfs/ne/boston/reynolds-ave/project-map.pdf</a>
11	LSP, National Grid	Construct New Stafford St. Substation	<a href="https://www.leicesterma.org/sites/g/files/vyhlf781/f/uploads/a127_b128_tline_bypass_noi_package_final_2_18_22.pdf">https://www.leicesterma.org/sites/g/files/vyhlf781/f/uploads/a127_b128_tline_bypass_noi_package_final_2_18_22.pdf</a>

*We were able to track down the coordinates of only 11 proposed new substations because the utilities do not include specific locations for many of these projects, referring more broadly to a city or two. Without additional information, we were unable to include those in this analysis.*

## Endnotes

1. Electricity generating unit is a component of a power plant that produces electricity over time. Some power plants may have multiple units on a single plant site.
2. The law requires the consideration of the following demographic data for the residents of each census block group in the Commonwealth: household income level, English language proficiency, self-identified race, and race plus municipal income level.
3. Source from S&P Global Market Intelligence Capital IQ Pro. © 2024 S&P Global Market Intelligence (and its affiliates, as applicable) (individually and collectively, “S&P”). Reproduction of any information, data or material, including ratings (“Content”) in any form is prohibited except with the prior written permission of S&P. S&P does not guarantee the accuracy, adequacy, completeness, timeliness or availability of any Content and is not responsible for any errors or omissions (negligent or otherwise), regardless of the cause, or for the results obtained from the use of such Content. In no event shall S&P be liable for any damages, costs, expenses, legal fees, or losses (including lost income or lost profit and opportunity costs) in connection with any use of the Content.
4. 1 megawatt (MW) or larger.

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