

## Adequacy of the Electric Distribution System and the Electric Grid

Questions have been raised regarding the adequacy of the Eversource distribution system and the New England electric grid, particularly in the context of the need for electrification in order to address climate change.

Both Eversource and the Federal Energy Regulatory Commission (FERC) have raised concerns that if this winter is unusually cold New England might not have adequate energy supplies. The Independent System Operator-New England (ISO-New England), which manages New England's electric grid, says both that it expects the coming winter to be mild, and that it believes the region is safe in the short term (two years), but that the longer term requires offshore wind. The National Oceanic and Atmospheric Administration (NOAA) echoes ISO's forecast for this winter's temperatures in New England (<https://www.noaa.gov/news-release/us-winter-outlook-warmer-drier-south-with-ongoing-la-nina>).

Here's why offshore wind must—and will—be developed, and why additional electrification will not threaten regional power supplies.

A few basics:

- Eversource manages the *electric distribution system* in Newton. Eversource does not generate electricity. ISO-New England, overseen on the federal level by FERC, manages the region's *power supply* and transmission.
- Eversource officials have assured the City that the distribution system is adequate, reporting in two meetings called by the City to discuss system capacity in Newton that all three substations serving Newton have “adequate headroom,” although it is possible that the system may need local upgrades for customers with large new electrical demand. At these meetings, City officials have apprised Eversource of its commitment to electrification (i.e., the 4 Our Future campaign, and potentially BERDO and an electrification ordinance). Eversource will be including these City initiatives in its annual revision of its 10-year plan. Eversource is also initiating projects to upgrade two underground transmission cables to Newton Highlands. Therefore, it is chiefly the regional power supply, not the local delivery system capacity, that is in question.
- Meeting Newton's and the State's greenhouse gas (GHG) emissions reduction goals requires electrification because the electric grid can be made cleaner (by using renewables like solar and wind power), but heating fuels and gasoline cannot. But electrification of heating (we'll stick with heating, rather than with cooking and transportation) is beneficial only if it is generated at least in part with renewable power—the more the better—and only if the heating technology used is efficient.
- Even now, with the current electric grid mix (about 17% renewables, including hydro), using an electrically powered air-source heat pump to provide heating (and cooling) results in less than half the GHG emissions of an efficient boiler powered by natural gas.

In 2050, thanks to the expected increase in solar- and wind-generated power, electric heating is projected to reduce GHG emissions by 98 percent compared with gas heating.

- New England is a summer-peaking region, meaning that we use the most electricity in the summer. But, counter-intuitively, the region is much more strapped for energy in the winter. That's because there is competition for natural gas in the winter, which is used both for electricity generation *and* for heating.
- Even in New England, solar is a great resource, but offshore wind can supply much more power than solar. In New England, solar has a "capacity factor" of about 15% (because it's not sunny during the night or on overcast days), while offshore wind has a capacity factor of about 45% (because it's really windy off the New England coast). "Capacity factor" is a measure of how often a facility is operating at maximum power.
- ISO-NE, the manager of the New England electric grid, says that over the next two years there is no power supply problem unless there is an extreme cold snap (which neither the ISO nor NOAA currently forecasts). The ISO reports that over the longer term there will be a shortage *only if* there is not substantial offshore wind generation.
- Massachusetts law requires the electric utilities to procure 5,600 megawatts of offshore wind by 2027 (the equivalent of about nine medium-size coal plants). The 800 megawatt Vineyard Wind project is already moving forward, having secured financing before the spike in inflation, recent increases in steel prices, and the war in Ukraine.
- Offshore wind is the only large low- or no-carbon resource available in New England. The import of large quantities of Canadian hydro is highly unlikely. Siting nuclear power plants in New England is a non-starter.

Here's how that all adds up:

**New England must develop its offshore wind resource within the next few years in order for the region's power supply to remain secure.** This is a necessity for the capacity of the electric grid, although offshore wind is also necessary in order to enable Massachusetts and other New England states to meet their climate goals.

The warning raised by Eversource and FERC that New England's power supply could be inadequate this winter in the event of unusually cold weather have raised concerns in some quarters that additional electrification will only further threaten power supplies. This is not true for a number of reasons. Electrification will relieve the pressure on the winter natural gas supply, as electricity rather than natural gas is increasingly used for heating. In any event, for better or worse, widespread electrification will happen only gradually (likely in a limited number of communities, and likely only for new construction and major renovations). Moreover, the new building codes being promulgated by Massachusetts require buildings to be constructed to much higher efficiency standards as compared to current codes—meaning the use of less power (and energy and costs savings for consumers).

Meanwhile, there has been publicity this fall about the fact that two major offshore wind developers have sought to renegotiate their contracts with Massachusetts and Connecticut because of rising costs due to inflation, the war in Ukraine, supply chain issues, etc. The utilities

have refused to discuss reopening the contracts, and the State Department of Public Utilities has taken their side. However, the developers have now agreed to move forward with the windfarm development, notwithstanding the financing challenges that caused them to try to reopen the contracts.