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New England Energy Vision
Governance Reform Comments
March 24, 2021

If the goal is decarbonization . . .

Background

The New England states have convened several joint meetings to explore how changes to the New England electric grid can better support state policies and goals. In their Vision Statement, the states chose three topics for discussion: market design, system planning, and governance reform. The following governance reform comments support changes to the ISO New England tariff to better align ISO New England's mission with state policies.

At the first forum, the states described their particular goals and timelines for achieving them. Common among all the state policies and goals was a commitment to reduce carbon throughout the New England economy. Subsequent presentations over three meetings addressing wholesale market and system planning issues also noted the state goals for decarbonizing their economies. Numerous studies over the past several years have examined how decarbonization can be accomplished.[1] They all diagnose the same problems and develop possible solutions. The solutions fall within a relatively narrow band of choices. The New England economy must reduce carbon in transportation, in buildings, and on the electric grid.

All the studies agree with this assessment and all evaluate possible solutions to most cost-effectively achieve a decarbonized economy. This means reducing the consumption of oil and gas for electricity production, transportation, and buildings.

For the electric grid, the replacement fuels can vary, but most studies recommend major increases in solar, wind, imported hydro, and perhaps future exotic resources (hydrogen and advanced nuclear to name two). To efficiently and reliably dispatch this new fuel mix, the configuration of the New England grid will evolve to accommodate new resources and storage technologies, and to use all resources in a more integrated way.

Solutions

Reducing carbon fuels and related greenhouse gases means reducing fossil fuel consumption across the New England economy.

[1] A partial list: MA EEA *Massachusetts 2050 Decarbonization Roadmap;* E3 and EFI *Net-Zero New England* (2020); Acadia Center *Declining Role of Natural Gas* (2020); Brattle Group *Achieving 80% GHG Reduction by 2050* (2019); EPA *US Greenhouse Gas Emissions and Sinks 1990-2018;* CLF *Getting Off Gas: Transforming Home Heating In Massachusetts;* and ISO-NE PAC Forecasts and Economic Studies (several).

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This is one of the first clues about how to proceed. The old adage "when you find yourself in a hole, the first thing to do is to stop digging" applies here. Solutions that continue to rely on a carbon-based electric grid diminish the success of programs that encourage electrification of vehicles and buildings to reduce fossil fuel consumption. For example, if grid electricity uses 20% fossil fuels, then vehicle and building electrification conversions reduce only 80% of their current fossil fuel consumption, not 100%. With millions of vehicles, buildings, and homes to decarbonize, the difference between an 80% or 100% reduction in fossil fuel consumption will significantly delay the achievement of state targets. Even a grid with a 10% fossil fuel mix will cause substantial delay. The complete removal of fossil fuels from the electric grid will improve the ability of states to meet their economy-wide carbon reduction goals, and to do so most cost-effectively.[2]

New England has already made significant progress reducing carbon resources on the electric grid, and the trajectory over the next several years is encouraging. In 2010, natural gas provided almost 50% of grid energy. By 2020, that percentage had dropped to under 40%. With scheduled grid additions over the next few years, including major wind projects and a new hydro line from Canada, the amount of electricity provided from natural gas will continue to decline.

A study last year by Acadia Center determined, based on existing state policies and initiatives, that natural gas would provide less than 10.6 % of the region's grid electricity by 2030. If no new gas resources are commissioned between now and 2030, that percentage would drop to 9.2 %. The Acadia Center study results were based on a least-cost dispatch of available resources in 2030; the study did not include a reliability-constrained dispatch. A reliability analysis would help identify necessary grid enhancements to allow the unrestricted flow of available least-cost energy and reduce the need for fossil fuel resources.

Setting a target date of 2030 to decarbonize the New England electric grid will help establish an efficient, cost-effective pathway for carbon reductions throughout the New England economy.

Recommendation

If the states are in general agreement that reducing carbon over the coming decades is a common-sense and necessary response to accelerating climate change,[3] then the states need

[2] An additional reason to "stop digging", i.e., stop burning fossil fuels, is that recent studies have begun looking at carbon sequestration initiatives that rely on vegetative carbon sinks, e.g., New England forests. Whatever the costs are to enhance vegetative carbon sinks, not putting carbon into the atmosphere in the first place will be the more cost-effective solution.

[3] This response is supported by the growing scientific evidence of climate change effects related to increased fossil fuel consumption (carbon and greenhouse gasses). The evidence includes shrinking ice sheets at both poles; rising ocean levels; changes to ocean chemistry; extended and expanding droughts; diminished water tables; larger and more numerous wildfires; and expanded polar vortex events.

to enlist ISO New England as a partner to support their decarbonization goals. This effort will include the coming economic transition to a sustainable power grid without fossil fuels.

At its inception in 1997, ISO New England's mission was to develop wholesale market and transmission enhancements to support the reliable operation of the New England grid. At the time, ISO New England was a not-for-profit contractor to the transmission owners to operate the New England bulk power system. Upon becoming a fully independent Regional Transmission Organization (RTO) in 2005, ISO New England defined its mission as having three components: reliable day-to-day operation of the grid, development of competitive wholesale market mechanisms, and system planning for enhancements to the New England grid. Some have summarized ISO's mission as simply reliability, reliability, reliability for all three mission components.

To align ISO New England's mission with the states' goals and policies, a fourth reliability component needs to be added: decarbonization to ensure the reliable operation of a sustainable, efficient New England power grid.

To achieve a sustainable, efficient New England power grid, the following steps could be taken:

1. Amend the FERC tariff to establish that ISO New England's mission is to not only ensure day-to-day reliability and implement competitive markets, but also decarbonize grid resources and plan for the modernization of the New England grid. Language about affirmative cooperation and coordination with New England state policies would also be helpful.

2. Establish a 2030 target date for the ISO to plan for and develop a New England grid that can operate without carbon resources. Although each grid is unique and a timetable for achieving future goals very much depends on each grid's current resource mix, the New England grid has an existing resource mix that is not as dependent on fossil fuels as most regions of the United States.[4] A target of full decarbonization of the day-to-day operation of the New England electric grid by 2030 is reasonable.

3. To take account of unique winter demand issues, establish a performance goal for ISO New England of less than 5% fossil fuel energy from the New England grid by the end of 2030. If as the Acadia Center report indicates natural gas will contribute less than 11% of grid energy by 2030, reducing that contribution to less than 5% can be achieved. Meeting or exceeding this performance goal could trigger additional

[4] The Energy System Operator (ESO) in Great Britain has committed to enable its bulk power system to operate with no carbon resources by 2025. Grids that already rely on significant quantities of nuclear resources (such as France, Great Britain, and some regions of the US) will have shorter timetables than grids that rely primarily on fossil fuels today (some regions in the US, as well as India, China, and Australia).

compensation for ISO New England, a performance bonus, scaled to the level of reduction achieved.

The reason to separate the Step 2 "target" of complete (100%) decarbonization of the electric grid with a more achievable 2030 performance goal of 95% is because of weather uncertainty. Almost every decarbonization study identifies the current vulnerability of the New England electric grid to prolonged cold winter weather, particularly when combined with overcast skies and little wind. For the electric grid, this is a "last mile" issue related to reliable operations.[5] Grid operators will need to have back-up fossil fuel generation available during the transition to a primarily non-carbon grid. The occasional use of that generation to maintain reliability is unlikely to have much impact on annual emissions from electric grid resources, but will delay achieving the 2030 target date for complete grid decarbonization.

A Path Forward

Many of the resources and system enhancements necessary to decarbonize the grid are technically feasible. Developing the engineering and software systems needed to implement changes may be the biggest challenge. With its large staff of software and system engineers, ISO New England is well-situated for this task. The ability to make progress in decarbonizing the New England economy will require steady and committed leadership. Leadership that establishes goals and provides encouragement to meet those goals. This is a leadership model based on understanding where people want to go and helping them to get there. A joint-leadership effort between the New England states and the grid operator will be essential.

If the goal is decarbonization across the entire New England economy, then the region needs to find the most efficient solution. That solution should start with the rapid decarbonization of the resources providing grid electricity. Effective leadership at the national level in 1961 achieved a moon landing in less than nine years. Effective regional leadership can achieve a sustainable, decarbonized grid in less than nine years as well.

-respectfully provided by
Paul Peterson, CEO
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[5] The phrase "last mile" is often applied to transportation issues such as packages and commuters. A package from Europe or commuter to a city can often get close to its destination, but the "last mile" can be a challenge and expensive. Achieving the ability to operate a 100% non-carbon grid is a useful and necessary target, but getting from 99 to 100 percent may be a formidable challenge with the fuel-mixes that are anticipated today.

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Attachment: New England Energy Vision Governance Comments, Mach 24, 2021

Paul Peterson, CEO
2021 Short Bio

Paul founded Energy Analysis in January 2020. The firm's first work involved documenting the declining use of natural gas for electric generation in New England, as well as forecasting future declines based on displacement by state-contracted renewable resources. This information was useful to clients in Connecticut working on the transition to a more renewable electric grid. Unfortunately, COVID travel restrictions provided only limited opportunities for in-person advocacy. Since July, the firm has focused on how to rapidly implement decarbonization solutions.

Prior to Energy Analysis, Paul was a consultant with Synapse Energy Economics, Cambridge, Massachusetts, for eighteen years. He focused on New England wholesale grid operations, including markets and system planning, as well as occasional projects in other regions with centralized grid operators. Clients were primarily consumer advocate and environmental organizations.

From 1998 to 2001, Paul worked for ISO New England as Coordinator of Regulatory Affairs. He worked with state and Federal regulators on a wide range of issues related to market development, market operations, and system planning during ISO New England's formative years.

Immediately prior to his position with the ISO, Paul worked for the Vermont Public Service Board as a Policy Analyst. For his eight years with the Board, Paul focused on utility compliance with energy efficiency programs and helped lay the ground work for what became the Vermont Energy Efficiency Utility. In 1996, he chaired the NECPUC Staff Energy Policy Committee that helped begin the transition to competitive wholesale markets managed by an independent system operator (ISO).

His early work in the energy field was with the University of Vermont Extension Service. For ten years Paul conducted energy audits of homes, farms, and businesses in Vermont.

Paul has a Bachelor's degree from Williams College, *cum laude*, 1974 and a Juris Doctor Degree from Western New England University School of Law, *cum laude*, 1990.