

Acadia Center Comments on Connecticut's Draft Integrated Resource Plan



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February 17, 2021

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To Whom it may Concern,

Acadia Center thanks the Connecticut Department of Energy and Environmental Protection (DEEP) for the opportunity to comment on the draft Integrated Resources Plan (IRP). Acadia Center is a non-profit research and advocacy organization committed to advancing the clean energy future and to [Making This Decade Count](#). Acadia Center is at the forefront of efforts to build a clean, low-carbon and consumer friendly economy. Acadia Center's approach is characterized by reliable data, comprehensive advocacy, and problem solving through innovation and collaboration.

Public Act 18-82 requires that by January 1, 2030, Connecticut will have reduced its greenhouse gas (GHG) emissions by 45% relative to 2001 levels. Executive Order 3 requires that ten years later the state will have reached zero carbon emissions from the electric sector. A further ten years later, in 2050, the state must reduce its GHGs to at least 80% below 2001 levels. Connecticut's integrated resources planning process is designed to focus on actions that the state can take to ensure that it is on track to achieve these targets equitably and affordably, and to recommend ways that wholesale markets can be reformed to reinforce these goals. This consideration represents a welcome departure from the last IRP process in which climate factors were not considered. Throughout the process, Acadia Center has engaged with DEEP by providing public comments, on [October 29, 2019](#), March 11, 2020 (not listed on DEEP Energy Filings website), and by participating in Technical Meeting on Policy and Modeling, held by DEEP on January 21 and 28, 2021.

Acadia Center is pleased to have the opportunity to submit these comments on the draft IRP and its appendices, beginning with areas where Acadia Center wishes to underscore its support of DEEP in the development of the draft IRP, followed by areas where Acadia Center urges DEEP to consider different assumptions and scenarios in finalizing the IRP.

Acadia Center expresses our support for the following policies in the draft, including DEEP's:

- Support for continued electrification efforts and recognition of the crucial role of energy efficiency as a resource;
- Support for legislation to enact a statutory requirement that the state meet its 2040 zero carbon electric goal;
- Exclusion of biomass as an eligible zero-carbon resource;

- Support for enhanced solar siting initiatives and streamlined siting, permitting, and development of solar resources on brownfield locations;
- Efforts to reform the ISO-NE capacity markets to remove barriers to further renewable energy investment and properly value those resources;
- Efforts to include municipal electric cooperatives in efforts to building a zero carbon grid; and,
- Determination that creation of a thermal-renewable portfolio standard(T-RPS) supporting biodiesel would exacerbate existing air pollution concerns and continue reliance on fossil fuels.

Acadia Center also provides comments regarding suggested technical improvements to the IRP, noting that the draft IRP:

- Should more adequately account for other states' decarbonization efforts, avoiding potential scenarios in which Connecticut must rely on existing natural gas electric power infrastructure in other states that may not be available in the coming decades, while underestimating the need for in-state energy storage and flexible load;
- Should avoid allowing polluting in-state fossil generation beyond 2040;
- Relies heavily on imported Canadian hydroelectric power as a low-carbon resource without transparent monitoring of its emissions profile, while not accounting for the difficulty of siting, permitting, and building large interstate-high voltage direct current (HVDC) transmission lines;
- Relies on Millstone nuclear generating facility in two scenarios but does not account for the potential of prolonged periods of resource unavailability as a result of retrofitting, upgrades, or relicensing requirements;
- Underestimates potential electricity load factors that will result from increased electrification in the transportation and the heating and cooling sectors, possibility misrepresenting projected future peak demand periods.

Support for Elements of the Draft IRP

Energy Efficiency, Weatherization, and Electrification

Energy efficiency is often called the “first fuel” for good reason: the best, least expensive energy is the energy that is never used at all. Energy efficiency can help all customers, but especially low-to-moderate income customers, save money through lower bills. The draft IRP rightly identifies energy efficiency as a cost-effective energy resource. Acadia Center strongly supports the draft IRP’s recommendations that Connecticut’s C&LM plans remain adequately funded and looks forward to working with DEEP to strengthen the program’s contribution to the state’s GHG reduction targets. The draft IRP notes the success of LED lighting retrofits which have reduced state-wide demand. However, as LED retrofits reach a saturation point at which there are fewer and fewer non-energy efficient bulbs to replace with LEDs, the state’s CL&M cannot expect to continue to rely on lighting savings

for efficiency gains. Rather, a more robust focus on whole-home weatherization, appliance replacement, and efficient home and commercial heating and cooling options will be necessary.

In a discussion of strategies to invest in the deployment of cost-effective energy efficiency and active demand response, the draft IRP recommends “authority for DEEP to procure energy efficiency and demand response that complements the existing C&LM programs.”¹ **It is Acadia Center’s opinion that this idea merits further consideration in the Energy Efficiency Board process.**

The draft IRP acknowledges that, to reach Connecticut’s GHG reduction targets, a substantial amount of building electrification must take place in the coming years. As the draft IRP makes clear, building energy performance upgrades like home weatherization will rapidly become a matter of great interest for the electric sector as heat pump penetration increases. However, C&LM Plan records show that the program only conducted 12,713 home energy audits in 2019, resulting in about 1,750 rebates for insulation or window replacement.² By contrast, there are 1.4 million housing units in Connecticut, more than 70% of which were built before the state adopted its first building energy code. At the current rate, it would take centuries to weatherize all the buildings in Connecticut that could benefit from weatherization. **Acadia Center recommends a renewed focus on whole-home energy efficiency starting in the 2022-2024 C&LM Plan. This will not only save money for residents across the state, but it will ultimately reduce the overall cost of building electrification to a substantial degree.**

Building electrification is crucial to the state’s ability to meet its climate commitments, as well as an important challenge—and opportunity—for the state’s electric power sector. As the draft IRP describes, DEEP has made its approval of the C&LM Plan partially contingent upon “increases to insulation and heat pump incentives.”³ Currently, energy efficiency program administrators offer a flat incentive of \$500 per home for a ductless or central ducted heat pump installation. However, a whole-home heat pump installation can cost between \$9,000 and \$25,000. In order to spur building owners to act expeditiously, it is important that DEEP and the program administrators increase this incentive amount. **Acadia Center recommends that DEEP continue to demand these changes to the programs.** Massachusetts, for example, offers \$1,250 per heating ton in situations where the heat pump replaces oil or propane—equivalent to about \$5,000 or more for an average-sized single-family home. Maine recently increased their maximum incentive to \$1,500 for homes, \$2,500 for low-income households, and up to \$4,800 for commercial buildings.

¹ Integrated Resources Plan: Pathways to achieve a 100% zero carbon electric sector by 2040. Page 158, (December 2020), <https://portal.ct.gov/DEEP/Energy/Integrated-Resource-Planning/Integrated-Resource-Planning>. (Accessed February 9, 2021).

² Connecticut Statewide Energy Efficiency Dashboard, <https://www.ctenergydashboard.com/Public/PublicHESActivity.aspx>. (Accessed February 9, 2021).

³ Integrated Resources Plan: Pathways to achieve a 100% zero carbon electric sector by 2040. Page 125, (December 2020), <https://portal.ct.gov/DEEP/Energy/Integrated-Resource-Planning/Integrated-Resource-Planning>. (Accessed February 9, 2021).

Legislation Enacting 100% Zero Carbon Electric Supply

Although Executive Order 3 requires zero carbon emissions from the electric sector by 2040, in the draft IRP, DEEP calls for legislation put this target into statute. Acadia Center agrees with DEEP that a statutory target for zero carbon electric grid by 2040 would complement the broader economy-wide decarbonization goals laid out in the Global Warming Solutions Act. By passing legislation, the state will ensure that the zero-carbon goal has the force of law necessary to drive the significant changes in the state's electric sector that are necessary in order to reach the 2040 goal and beyond.

In addition, Acadia Center supports DEEP's position that biomass is not a carbon neutral resource and should not be used to meet the state or region's electric decarbonization goals.

Solar Siting Opportunities

Acadia Center supports DEEP's attention paid to developing appropriate solar siting opportunities in the state. The draft IRP correctly notes that the environmental and land-use impacts of ground-mounted solar vary greatly and depend on the physical attributes of the site. Solar power is one of the cleanest, most affordable sources of renewable, zero-carbon energy available to the region. Acadia Center supports efforts to prioritize brown-field over green-field sites, especially farmlands, forests, wetlands, and other habitat space. DEEP's efforts to provide clarity, predictability, and assistance to communities, landowners, and developers in the state by pre-screening potential sites throughout the state could significantly ease the possibility of siting challenges and delays.

In 2019 and 2020, Acadia Center partnered with American Farmland Trust, Conservation Law Foundation, Vote Solar, and Vermont Law School on the [Smart Solar Siting Project for New England](#). The project convened stakeholders from all sectors, [completed detailed policy analyses, developed solar siting case studies, performed land use research, and evaluated equity impacts of solar project siting](#) – assessing the potential of each of the New England states to meet their climate and solar generation goals. Acadia Center published an analysis – [Meeting New England's Solar Needs on Contaminated Sites and Rooftops](#) - detailing how much of the Northeast region's solar generation goals could potentially be met through development of rooftops and contaminated sites as alternatives to development on farm and forest land. Another possible model is the New York State Energy Research and Development Authority's recently released [Clean Energy Resources Development and Incentives "Build Ready" Program Implementation Plan](#). The program "...prioritizes the development of sites that commercial developers might elect not to pursue due to complicated development challenges, including those on existing or abandoned commercial sites, brownfields, landfills, former industrial sites, and other abandoned or underutilized sites." As it develops a stakeholder process as contemplated in the draft IRP, Acadia Center recommends that DEEP look to recent regional and state efforts to address appropriate solar siting as the starting point for guiding its next steps in advancing the development of this important resource.

Regional Wholesale Market Reforms and Coordination

Acadia Center strongly supports DEEP's prioritization of a range of reforms to the region's electricity grid, including updating wholesale market rules, governance structure of the wholesale markets, and the approach to transmission planning to ensure the region's clean energy goals are met. The draft IRP builds on the [New England](#)

[Governors' Vision Statement](#), describes the flaws and shortcomings in these three areas, along with the challenges these shortcomings pose to Connecticut and the region. Acadia Center agrees with the principles in the draft IRP that must apply to future reforms and has long advocated for reforms to ensure that clean energy resources are fully incorporated into and valued in the market. Acadia Center is actively participating in the regional forums and will provide detailed comments as requested, as well as respond to the proposed recommendations that result from this ongoing process. **Acadia Center urges DEEP to push for the incorporation of equity and environmental justice principles in the consideration of reforms to governance, market rules, and transmission planning from the outset to ensure that any reforms do not add to the burdens borne by the region's most vulnerable residents.**

Municipal Electric Cooperatives

According to the draft IRP, municipal electric cooperatives serve approximately 6% of Connecticut's electric load but are not included in efforts to meet the GWSA economy-wide targets. **Acadia Center supports the Connecticut Municipal Electric Energy Cooperative's (CMEEC) ongoing plans to develop decarbonization strategies, noting that municipal cooperative should be required to meet GWSA targets in a manner appropriate to their specific circumstances.** Transparent and comprehensive reporting requirements are also essential to ensuring that the whole state is on track to meeting its decarbonization goals, as well as to ensuring that all communities in the state benefit from the ratepayer and public health benefits of decarbonization.

Thermal Renewable Portfolio Standard (T-RPS)

Without a plan to electrify buildings now, Connecticut will fail to decarbonize fast enough to meet the economy-wide targets. The potential for biodiesel to prolong fossil fuel use in buildings is of particular concern, as heating systems commonly last longer than 20 years. **Acadia Center supports DEEP's determination that the creation of a T-RPS subsidizing biodiesel would exacerbate air pollution and perpetuate the use of fossil fuels. Additionally, Acadia Center agrees with DEEP's concern regarding the limited supply, nationally, of waste grease biodiesel compared to soy biodiesel.**

Elements of the Draft IRP Causes of Concern

A fully decarbonized electric sector is the bedrock of any broader, economy-wide low-carbon future, and crucial to the long-term success of the state's emission reduction strategy. Decarbonization of the electric sector must keep pace with or move faster than rates of electric vehicle adoption and replacement of fossil fuel heating with highly efficient electric air-source heat pumps (ASHPs) in homes and commercial buildings.

Connecticut is a part of New England's ISO (ISO-NE), and draws its electricity from the same grid that all New England states share. This means that electricity generated within Connecticut may not be consumed within the state, and by corollary, electricity used to meet Connecticut's needs may come from elsewhere. In developing its IRP, it is then unavoidable that DEEP must make certain assumptions about how both the electricity supply mix and electricity demands both inside and outside Connecticut may evolve in the future.

Even though it is not DEEP's responsibility to advocate for clean electricity targets in other states, it is DEEP's duty to plan for a future for Connecticut that is compatible with grid decarbonization and electrification policies in

those other states. In general, Acadia Center finds the draft IRP’s assumptions about demand and supply outside of Connecticut make it much easier to achieve the 100% zero carbon electricity called for by EO 3 than it may be in reality.

Regional Greenhouse Gas Targets and Out-of-State Gas-Fired Generation

While the draft IRP’s GHG accounting describes how Connecticut can achieve its zero-emissions electricity target, it relies on assumptions about the level of decarbonization in other states that are overly permissive, allowing for higher emissions in other states than those states expect given current policies. The assumptions in the draft IRP rely on the rest of the ISO-NE grid to provide fossil-fueled balancing power for Connecticut that may not exist, if other states in the region successfully decarbonize their electric grid. The result is too little consideration of the need for Connecticut to manage variability in supply and demand within the state with energy storage, flexible load, and flexible generation assets.

Acadia Center recognizes that assumptions and modeling parameters must, at some time, become fixed to proceed with running the IRP scenarios. But since these inputs were finalized, a great deal has changed among New England states’ clean electricity targets, which Acadia Center argues were “known or knowable” during the IRP’s modeling phase. **At a minimum, Acadia Center feels that more aggressive action by Connecticut’s New England neighbors should have been explored as a key uncertainty, as Acadia Center advocated for in its March 11, 2020 filing.**

For example, the draft IRP assumes that Rhode Island will achieve its zero-carbon electric sector goal by 2040 and that Massachusetts will achieve 80% of electricity sales from clean energy sources by 2050. However, Massachusetts’ 2050 Decarbonization Roadmap⁴, used to develop an administratively set 2030 emissions target for the Commonwealth, charts a course to reach net-zero economy-wide GHG emissions in 2050, implying well over 80% clean electricity supply. In Rhode Island, the Governor’s Executive Order⁵ has moved up the state’s decarbonization agenda by a full decade, aiming for 100% renewable electricity by 2030, not 2040. The draft IRP also notes that for the other three New England states (Maine, New Hampshire, and Vermont) emissions were held constant at their 2016 values. But DEEP should recognize that laws in these states, particularly Maine’s renewable portfolio standard of 80% by 2030 and 100% by 2050, will affect the overall carbon intensity of the ISO-NE grid, and limit the availability of out-of-state gas generation available to Connecticut.

In effect, the assumptions laid out in the draft IRP make achieving Connecticut’s 2040 goal seem easier than it will be when New England states work towards ambitious targets in unison. A key challenge of decarbonizing the electricity supply is mitigating the intermittency in renewable electricity generation, which requires flexible generation assets, flexible load, and the ability to store and release energy. Fossil fuel-fired power plants can provide some flexibility as they can be ramped up to produce energy on-demand. Since the draft IRP assumes relatively permissive GHG targets in other states, this leaves plenty of room for fossil generation – mostly gas – to

⁴ Massachusetts Executive Office of Energy and Environmental Affairs, MA Decarbonization Roadmap, <https://www.mass.gov/info-details/ma-decarbonization-roadmap>. (Accessed February 9, 2021).

⁵ Governor Gina M. Raimondo, “Advancing a 100% Renewable Energy Future for Rhode Island by 2030,” Pub. L. No. Executive Order 20-01 (2020), <https://governor.ri.gov/documents/orders/Executive-Order-20-01.pdf>. (Accessed February 9, 2021).

remain on the grid, providing flexible supply and supplanting the need for energy storage resources. The result is that the draft IRP assumes that the rest of New England provides balancing resources for Connecticut's clean energy, absorbing clean energy produced in the state during periods of surplus, and returning that energy during periods when renewable generation is low, all while on net, achieving net-zero emissions. Figure 111 of Appendix A.3 in the draft IRP illustrates this best, showing that in some months, Connecticut is projected to be a net importer of clean energy, and in other months a net exporter, so that, on balance, its annual electricity demand is met using clean resources. The problem of handling intermittency becomes outsourced to the other states, which are assumed to have gas-fired resources at Connecticut's disposal. **Acadia Center believes that this assumption, however, is incompatible with recently released state plans, as detailed above.**

The most direct comparison comes from Massachusetts' 2050 Decarbonization Roadmap, which shows in its "All Options" scenario that only 4.7 TWh of gas-fired electricity would be produced in 2040, in-state.⁶ But in that year, the draft IRP's "Balanced Blend" case, for its Electrification load scenario, calls for approximately 20 TWh of fossil fuel-fired generation from across the region.⁷ Even the most gas-restricted scenario in the draft IRP assumes nearly 140,000 Mcf of natural gas demand in the region by 2040, equivalent to the 2019 natural gas demand for Connecticut's electric power sector. Currently, Massachusetts and Connecticut collectively account for 73% of New England's natural gas consumption for electricity, with Rhode Island accounting for an additional 16%.⁸ **With these three states projecting a phase-down of gas-fired electricity in the coming decades, it is unclear where DEEP expects the projected natural gas-fired electric generation to be located within ISO-NE. As a result, Connecticut risks relying on a large amount of gas generation remaining on the ISO-NE grid through 2040 that in fact might not be available if other states in the region successfully decarbonize their electric grid.**

In-State Gas-Fired Generation in Environmental Justice Communities and the Possibility of Stranded Gas Assets

The integrated energy and capacity markets of ISO-NE allow for natural gas combined cycle facilities to be located in Connecticut while exporting the power out-of-state. While the draft IRP does not address the issue of natural gas electric infrastructure located in the state that is used to service out-of-state load, DEEP should consider the possibility that the state will be home to polluting natural gas resources that do not serve Connecticut ratepayers. The harmful polluting emissions from these plants, however, directly affect Connecticut residents. Existing gas plants are sited disproportionately in environmental justice communities, with disadvantaged communities

⁶ Evolved Energy Research, "Energy Pathways to Deep Decarbonization: A Technical Report of the Massachusetts 2050 Decarbonization Roadmap Study," Massachusetts 2050 Decarbonization Roadmap (Massachusetts Executive Office of Energy and Environmental Affairs, December 2020), <https://www.mass.gov/doc/energy-pathways-for-deep-decarbonization-report/download>. (Accessed February 8, 2021).

⁷ Connecticut Department of Energy and Environmental Protection, "Appendix A3: Modeling Results," in Integrated Resource Plan, 2020, 3, <https://portal.ct.gov/-/media/DEEP/energy/IRP/2020-IRP/Appendix-A3-Modeling-Results.pdf>. (Accessed February 8, 2021).

⁸ U.S. Energy Information Administration, Natural Gas Consumption by End Use, https://www.eia.gov/dnav/ng/ng_cons_sum_dcu_nus_a.htm. (Accessed February 8, 2021).

forced to shoulder the burden of polluting infrastructure. For example, the proposed 650-megawatt Killingly Energy Center in Killingly, Connecticut would be located in an environmental justice designated community ZIP code, as defined by the Massachusetts Executive Office of Energy and Environmental Affairs, potentially exacerbating existing environmental justice concerns.⁹ In addition, the draft IRP identifies six additional fossil-fuel fired generators to be used for peak demand located in environmental justice communities, together representing almost 40% of in-state generation and responsible for 47% of NO_x emissions. **Acadia Center asks that DEEP reconsider any future scenario that allows gas generation to remain in Connecticut beyond 2040, even if all electricity generated is exported out-of-state.**

In addition, there are concerns regarding the possibility of stranded assets in Connecticut, meaning the owners are no longer able to recoup their costs as states in the region continue to decarbonize. The proposed Killingly Energy Center, for example, will not begin commercial operation until 2024, at the earliest. With Connecticut committed to phasing down all gas electricity generation in the state by 2040, and with other states either following suit or not far behind, it is unlikely that the Killingly plant will be able to recover its costs by continuing to deliver electricity to the ISO-NE grid. In its own analysis, Acadia Center has found that newly built gas plants risk becoming stranded in New England, even without considering zero-carbon grid policies like those in Connecticut and Rhode Island.¹⁰

The final IRP should consider addressing the environmental justice concerns of communities in which existing and planned gas power infrastructure are located, in light of the overall objective of the IRP and state policy to reduce in-state emissions, improve local air quality, and decarbonize the state by removing scenarios that allow fossil-fueled generation to remain in Connecticut.

Reliance on Imported Hydroelectricity and HVDC Constraints

Electricity imported into New England through high-voltage direct current (HVDC) transmission lines, mostly from Hydro Québec (HQ), is a large component of the draft IRP scenarios' resource portfolios. In all scenarios, the New England Clean Energy Connect (NECEC) line provides about 9.5 TWh per year to the New England grid starting in 2023, for which Massachusetts will claim all of the environmental attributes. In addition, for all the draft IRP's Electrification load scenarios that show Millstone retiring, Millstone's absence leaves behind a clean energy gap that is filled primarily by additional hydroelectric imports. However, the clean energy benefits of large-scale impoundment hydroelectricity, which comprises the majority of HQ's electricity production capacity, should be more carefully and transparently documented. For example, analysis of two years of data from the New England Power Pool Generation Information System, which tracks renewable energy certificates, reveals that from 2018 to 2019 only 11% of imports into New England from HQ were issued such certificates to confirm that it

⁹ Massachusetts Executive Office of Energy and Environmental Affairs, Environmental Justice Populations in Massachusetts, <https://www.mass.gov/info-details/environmental-justice-populations-in-massachusetts#what-is-an-environmental-justice-population?-.> (Accessed February 9, 2021).

¹⁰ Acadia Center, The Declining Role of Natural Gas Power in New England, (June 2020), <https://acadiacenter.org/resource/the-declining-role-of-natural-gas-power-in-new-england/>.

was low-carbon hydropower.¹¹ Acadia Center asks that DEEP **recommend that HQ provide real time emissions data tracking to ensure that there is publicly available information to track the emissions profile of exported power in any future contract for HQ hydropower.**

Our understanding is that HQ estimates that through increased dam efficiency and overbuilding their hydroelectric system in anticipation of increased demand over the last two decades, about 25-30% of the existing system could produce power for additional export. DEEP should make sure that HQ can document that it has sufficient excess hydroelectric capacity to meet New England's and New York state's needs as they continue to decarbonize and electrify. While data that Acadia Center has reviewed suggest that existing, mature hydropower impoundments in cold, boreal climates like northern Québec produce low-carbon energy, science on methane emissions from newly-flooded hydro impoundments shows that they can create an initial emissions "bomb" as damaging to the climate as fossil-fuels.¹² **Our understanding is that HQ does not have near term plans to create new impoundment and Acadia Center does not support policies that would encourage the additional buildout of Canadian hydroelectric impoundment dams.** Additionally, hydro reservoirs create major, permanent changes to watersheds and surrounding landscapes, which impacts the biosphere and can disrupt traditional ways of life. **Acadia Center applauds the draft IRP's focus on environmental justice communities in Connecticut and underscores the importance of also addressing First Nation environmental justice issues in Canada.**

Separately, DEEP should recognize that project timelines required to design, site, permit, and build large scale HVDC transmission projects are uncertain and can take many years. The NECEC, and its failed predecessor, the Northern Pass HVDC line through New Hampshire, encountered significant obstacles and delays. Finally, DEEP must recognize that Connecticut is not the only state for which hydropower imports, potentially from new impoundments, figure prominently in the state's decarbonization plan. Although imported hydroelectricity is a shared resource for the grid, its environmental attributes may not be, depending on the nature of contracting arrangements with Canadian producers. Yet in the draft IRP, in all scenarios in which Millstone is retired, Connecticut lays claim to 100% of new HVDC imports over and above NECEC, which includes the proposed Atlantic Link line. **While Acadia Center recognizes the essential role that hydropower, particularly Canadian hydropower, will play in the decarbonized electric grid of the future, the draft IRP does not appropriately consider the scale of imports required, the competition between states for the same hydropower resource, and the difficulty in permitting and building the necessary transmission infrastructure to transport Canadian hydropower. Any decarbonization scenario that is reliant on Canadian hydropower to meet decarbonization targets should also establish emissions accounting and related safeguards to reduce uncertainty.**

¹¹ New England Power Pool and APX, "NEPOOL Generation Information System GIS Certification Statistics for Imported Certification, 01/2018 – 12/2019," https://www1.nepoolgis.com/myModule/rpt/ssrs.asp?rn=104&r=%2FPROD%2FNEPOOLGIS%2FPublic%2FNEPOOL_CertificateStatistics&apxReportTitle=GIS%20Certificate%20Statistics. (Accessed April 22, 2020).

Millstone Nuclear Power Plant

The draft IRP assumes that the Millstone Nuclear Power Plant in Waterford, Connecticut will retire in 2029, except in the two Millstone-extension scenarios. In fact, the draft IRP shows how significant Millstone’s impact may be on costs, new capacity needs and price effects, with the retirement or retention of Millstone acting as a dividing line between two possible futures. Therefore, whether or not Millstone is available beyond 2029 is significant factor in the modeling outcomes and the success of state policy in decarbonizing the electric sector. In the two Millstone extension scenarios, DEEP staff indicated in the technical sessions that while they accounted for periodic refueling outages, they did not account for prolonged periods of resource unavailability as a result of retrofitting, upgrades, or relicensing requirements. Acadia Center notes that these outages can reduce the availability of a generating unit by 25-75% in the years leading up to the license reissue.¹³ Millstone Unit 2’s license expires in 2035; should the plant be operational past 2029, there is the possibility that 870 MW of capacity might be taken offline for a significant amount of time sometime before 2035.¹⁴

The draft IRP finds that Millstone could provide 16,918 GWh¹⁵, or 44% of Connecticut’s gross clean energy needs in 2040, but to achieve that, the state must also make plans to meet its clean energy goals while each unit is unavailable during any repairs or modifications required by the nuclear regulator. **Acadia Center supports the continued reliance on Millstone during its current license as a necessary, bulk zero carbon resource, if it is safely operated and cost-competitive with other resources without additional subsidy. However, Acadia Center is concerned that the draft IRP does not consider the possibility of prolonged outages at Millstone and the effect that would have on achieving decarbonization of the electric sector.**

Projected Electricity Demand and Future Peak Load

Acadia Center recognizes that the IRP is primarily a supply-side planning document, and that it is intended to consider how different supply strategies (including load flexibility and other demand resources) might satisfy different levels of electricity demand. The electricity demands used in the Base and Electrification load scenarios are exogenous; they are not “modeling results” used to inform policy interventions related to energy use.

However, this should not absolve DEEP from selecting a sufficiently aggressive level of end-use electrification in their Electrification load scenario that is consistent with what would be needed to meet the state’s current – or likely future – economy-wide net-zero mandates for 2050. Acadia Center finds that the level of electrification assumed in 2040 under the Electrification Scenario could indicate that Connecticut and other New England states may already be on track to miss electrification requirements in 2050, ten years later. Vehicles and heating

¹³ U.S. Nuclear Regulatory Commission, “Generic Aging Lessons Learned (GALL) Report — Final Report (NUREG-1801, Revision 2),” 1996, <https://books.google.com/books?id=Tyw3AQAAMAAJ&pg=PR1#v=onepage&q&f=false>. (Accessed February 9, 2021).

¹⁴ U.S. Nuclear Regulatory Commission, Millstone Power Station, Unit 2, <https://www.nrc.gov/info-finder/reactors/mill2>, (Accessed February 9, 2021).

¹⁵ Connecticut Department of Energy and Environmental Protection, “Appendix A4: Financial Analysis Results,” in Integrated Resource Plan, 2020, 4, <https://portal.ct.gov/-/media/DEEP/energy/IRP/2020-IRP/Appendix-A4--Financial-Analysis-Results.pdf>. (Accessed February 9, 2021).

systems can last 15 – 20 or more years, which means that by 2040, a portion of 2050 GHG emissions are already locked in. In the draft IRP Electrification scenario, some categories of energy demand are omitted altogether, such as industry or domestic hot water, while other categories increase too slowly. For example, despite Connecticut being a signatory to the Multi-State Medium & Heavy Duty Zero Emission Vehicle Initiative, sales of electrified heavy- and medium-duty vehicles are not assumed to begin until 2025, which makes reaching the Initiative’s sales target of 30% in 2030 challenging or unlikely. Light-duty cars and trucks are assumed to comprise only 35% of the fleet by 2040, about half of what Massachusetts’ 2050 Decarbonization Roadmap calls for in 2040 in route to meeting its 2050 net-zero goal.¹⁶ Electricity demand may increase faster than expected in the draft IRP if economy-wide net-zero targets are to be realized. Planning should be compatible with that outcome, recognizing that the job of decarbonization may be more challenging and more costly than suggested by the draft IRP.

Planning for growth in annual electricity demand is important. But in a future dominated by seasonally variable energy production, it is equally important to plan for the evolution of peak load. At DEEP’s Second Technical Meeting on January 28, 2021, DEEP clarified that its electrification scenario continues to show electricity demand peaking during summer months in 2040. However, other recent studies covering all of ISO-NE show that the region is likely transition to a winter-peaking system sometime before 2040 as a result of increased ASHP and EV adoption. Massachusetts’ 2050 Decarbonization Roadmap¹⁷ forecasts a two-peak electricity system in 2040 (winter and summer), while a regional study completed by Energy Futures Initiative and E3 show a single system peak in winter, as early as 2035.¹⁸ Properly assessing peak load seasonality is a critical factor in assessing the reliability of the grid, particularly in regards to knowing which hours and days of the year are most likely to be carbon-intensive, as well as what low-carbon resources may be available to meet that specific load. **Acadia Center is concerned that DEEP’s projection that ISO-NE will continue to be a summer-peaking system out to 2040 is contrary to load forecasts for the region, and that, more importantly, misestimating future peak load could result in incorrect load and resource generation projections.**

Other Issues

Waste-to-Energy Facilities

¹⁶ The Cadmus Group and Evolved Energy Research, “Transportation Sector Report: A Technical Report of the Massachusetts 2050 Decarbonization Roadmap Study,” Massachusetts 2050 Decarbonization Roadmap (Massachusetts Executive Office of Energy and Environmental Affairs, December 2020), <https://www.mass.gov/doc/transportation-sector-technical-report/download>. (Accessed on February 9, 2021).

¹⁷ Evolved Energy Research, “Energy Pathways to Deep Decarbonization: A Technical Report of the Massachusetts 2050 Decarbonization Roadmap Study,” Massachusetts 2050 Decarbonization Roadmap (Massachusetts Executive Office of Energy and Environmental Affairs, December 2020), <https://www.mass.gov/doc/energy-pathways-for-deep-decarbonization-report/download>. (Accessed on February 9, 2021).

¹⁸ Energy and Environmental Economics and Energy Futures Initiative, “Net-Zero New England: Ensuring Electric Reliability in a Low-Carbon Future,” November 2020, https://static1.squarespace.com/static/58ec123cb3db2bd94e057628/t/5fb2e137585083165f1385d1/1605558599092/E3+EFI_Report+New+England+Reliability+Under+Deep+Decarbonization_Full+Report_11-16-2020_PUBLIC_330pm.pdf. (Accessed on February 9, 2021).

Acadia Center acknowledges that while waste-to-energy (WTE) facilities in Connecticut may serve ancillary public policy goals such as avoiding in-state landfills for municipal solid waste, they are not a zero emissions resource, emitting large amounts of carbon dioxide as well as criteria pollutants. The five in-state WTE facilities present potential environmental justice concerns for the communities in which they are located and potential rate-payer impacts, with the draft IRP identifying one plant (Hartford Resource Recovery facility) may need more than \$300 million in electric ratepayer or taxpayer support to be financially viable after 2025. Under no circumstances should DEEP encourage additional WTE facilities in the state and should work toward reducing the need for WTE facilities through improved waste management strategies such as enhanced recycling and composting organic waste. **While the overall capacity from the state's five WTE is low and the draft IRP notes that these resources cannot be easily replaced given their ancillary public policy role, Acadia Center believes that DEEP should work to minimize the role of WTE facilities in the state's clean energy future, eventually working to phase them out entirely.**

Data Transparency

Acadia Center requests the DEEP make available access to the numeric data behind the graphs in the draft IRP and appendices to allow for further analysis and accessibility, preferably online and in Excel format. This will allow stakeholders to better understand DEEP's analysis, projected timelines for different decarbonization scenarios, and allow for easy and accessible study of different scenarios.

Conclusion

Once again, Acadia Center is pleased to have the opportunity to submit these comments on the draft IRP and its appendices. We understand and appreciate the draft IRP's recommendation of further study of these and other critical energy strategies and policies in the upcoming Comprehensive Energy Strategy. Acadia Center looks forward to working with DEEP and other Connecticut stakeholders to ensure a full and accurate accounting of the greenhouse gas impacts of the various decarbonization pathways considered in the IRP.

For more information:

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