Advancing the Clean Energy Future

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Via Electronic Mail

March 22, 2021

Honorable Kathleen Theoharides, Secretary
Executive Office of Energy and Environmental Affairs
100 Cambridge Street, Suite 900
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Subject: Acadia Center Comments on the 2030 Clean Energy and Climate Plan, Chapter 3: Transforming our Buildings and Chapter 4: Transforming our Energy Supply

Dear Secretary Theoharides, Undersecretary Chang, and the 2030 Clean Energy and Climate Plan Team:

Acadia Center wishes to express all members of the team responsible for developing the draft 2030 Clean Energy and Climate Plan (CECP) as well as the groundbreaking and comprehensive 2050 Roadmap Analysis. These two efforts provide the Commonwealth and its stakeholders a solid basis upon which to advance climate policy. Please accept the following comments from Acadia Center on the CECP. Acadia Center's comments here focus specifically on Chapter 3: Transforming our Buildings and Chapter 4: Transforming our Energy Supply. In addition, we would like to draw your attention to Acadia Center's support for three other comment documents:

- Joint Comments on the 2030 CECP to Ensure Inclusion of Climate Justice
- Joint Comments on The Future of Gas
- Joint Comments on Transportation

Overarching Comments

- With the likely passage of S.30 into law, Acadia Center recommends EEA update its Roadmap Modeling and 2030 CECP to account for the 50% economy-wide target and the new policies related to buildings, electricity supply and distribution; and
- Acadia Center urges EEA to refine the final CECP's specificity regarding how the state will achieve the components of the plan. This should include: establishing the timing for each action in the plan, identifying the agency or department responsible for overseeing the action, estimating any additional funding necessary, and determining the need for additional statutory or regulatory authority.

Chapter 3: Transforming our Buildings

As Massachusetts prepares to implement an unprecedented policy program to reach zero net emissions by 2050, the targets included in the CECP for the buildings sector are appropriately ambitious. Acadia Center commends the Commonwealth for recognizing the critical role that a decarbonized commercial and residential building stock will play in reducing overall emissions. Buildings account for nearly a third of the Commonwealth's annual emissions. As the CECP recognizes, **rapid building electrification is the only reasonable way to eliminate these emissions.**

The CECP expects the building sector to make up the largest single sector for emissions reduction between now and 2030, totaling 9.4 million metric tons of CO_2e, —40 to 45% of total reductions before 2030. These are audacious targets, and **Acadia Center thanks the Baker Administration for recognizing the scale and speed with which the Commonwealth will need to act.** However, the CECP's plans related to buildings raises a few concerns. Among them:

1. **The Commonwealth has yet to adopt a specific strategy** for electrifying one million homes and 300-400 million square feet of commercial real estate by 2030.
2. **A regulatory or legislative target will be necessary** to ensure rapid progress and jump-start the marketplace for zero-emissions-ready technologies in buildings.
3. The CECP identifies Mass Save as a key tool for expanding electrification, but **limitations in the program's design and cost-effectiveness accounting methods** may impede its ability to support the number of installations envisioned by the CECP.

Ambitious Goals Require Audacious Policies

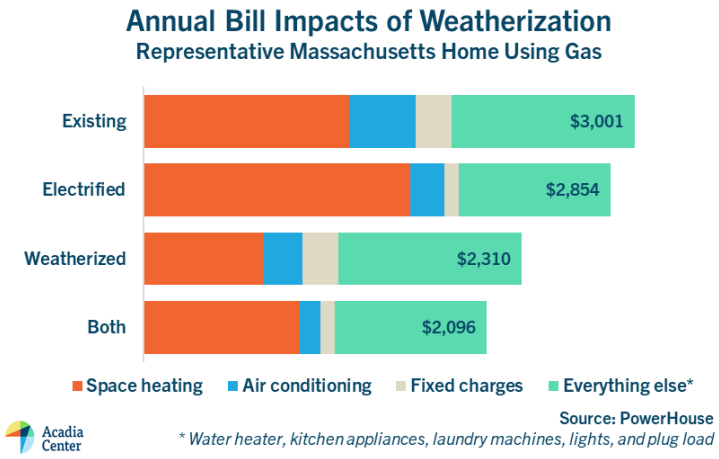
The goal of fully electrifying one million households and 300-400 million square feet of commercial real estate before 2030 is ambitious. This rate of transformation expects that about 40% of the Commonwealth's housing units—equivalent to nearly all of the 1,190,537 units that currently use oil, propane, or electric baseboard for heat[1]—will be converted to heat pumps in the next ten years.

Acadia Center is concerned that there is no framework in place that can achieve this goal. In 2019 and 2020, Massachusetts energy efficiency program administrators supported the installation of about 22,500 residential heat pumps—roughly 12,750 a year.[2] **More than 100,000 heat pumps will need to be installed annually** between now and 2030 to achieve the Commonwealth's target. This pace is more than 8 times faster than what the programs currently support, with no clear plans on how to ramp up to this pace.

In the coming years, the Commonwealth will have a golden opportunity to reduce emissions from buildings while creating or preserving jobs and saving families money. **As the CECP recognizes, a comprehensive policy strategy will be necessary to maximize these benefits.** Acadia Center recommends that such a strategy contain the following elements:

[1] U.S. Census American Community Survey. Public Use Microdata Sample 2019. Five-year estimates.
[2] Massachusetts Energy Efficiency Advisory Council, Quarterly Reports – 4th Quarter 2020 & 2019 Program Administrators' KPIs. (Accessed on March 3, 2021). https://ma-eeac.org/results-reporting/quarterly-reports/.

- **More investment in weatherization.** Acadia Center strongly agrees with the draft plan's emphasis on coupling electrification with weatherization in homes. Insulation and air sealing reduce electric demand from heat pumps, improve comfort, save money, reduce near-term emissions, and create local jobs. By electrifying and weatherizing at the same time, homeowners will benefit from more bill savings and lower up-front equipment costs. Up to 70% of housing units in Massachusetts were built before the first building energy codes were adopted, and a substantial proportion of those have not been insulated in the years since. Targeting these ultra-inefficient units for weatherization and electrification will lead to a huge reduction in emissions and significant energy burden relief. Slight revisions in the design of Mass Save programs to segment out and pursue potential participants in these buildings could be accomplished within the existing program framework, to the benefit of both consumers and the programs themselves.



- **Heavy focus on education and awareness.** Consumer education is essential, and—if it comes from a trusted source—the most effective strategy to support development of the Commonwealth's heat pump market. A robust consumer education program could provide objective, actionable information for home and business owners, spurring faster adoption of zero-emissions-ready equipment and allowing developers to take advantage of an expanding market. It will be important for the state to partner directly with HVAC contractors, who will be the main point of contact for most building owners considering an HVAC upgrade.

  MassCEC's "Clean Energy Lives Here" campaign is a good example of the type of easy-to-understand educational materials that the Commonwealth should consider devoting more resources to promoting. Additionally, it is crucial that any consumer education program provide information that is accessible to non-expert audiences and useful to homeowners and renters, low-to-moderate income households, and English-isolated households.

- **Jobs and economic development.** The Commonwealth's electrification goals represent a tremendous economic development opportunity. Investing in intensive weatherization and electrification work will support thousands of high-paying jobs. Before the pandemic began, energy efficiency supported 88,231 jobs in Massachusetts, but that number declined to 77,786 jobs by October 2020.[3] By investing heavily in weatherization and electrification, the Commonwealth can create meaningful work for people across the state, helping communities to "build back better." Acadia Center especially supports the Commonwealth's

[3] E4theFuture and E2. "Energy Efficiency Jobs in America." November 2020.

efforts to encourage the use of union labor—or at the very least, prevailing wages—to capture the economic benefits of decarbonization for families.

The Commonwealth Needs to Set an Electrification Target

The lack of a legal or regulatory requirement that codifies the Commonwealth's building decarbonization goals greatly diminishes their chances of success. Without a goal to drive toward and to hold parties accountable, even substantial incentives may not generate an adequate pace of system replacement.

The draft plan identifies Mass Save as a primary vehicle for deploying electrification. **Acadia Center supports the DOER's stated intention to phase out incentives for fossil fuel heating systems as soon as possible** and to end all fossil fuel heating incentives starting with the 2025-27 Plan. However, Acadia Center remains skeptical that Mass Save will be prepared to handle all—or even most—of the foreseen increase in building electrification without a separate, statewide regulatory framework that sets a clear trajectory away from combustible fuels. If the Commonwealth attempts to electrify its building stock mainly by harnessing slight shifts in consumer preference, it will not achieve the ambitious pace of heat pump installation set out in the CECP.

The absence of a regulatory standard for building electrification means that the programs must act as though all electrification projects occur incidentally as a result of consumer preference. Yet the CECP envisions that the transition will take place in large part because of government policy. **Without a clear standard, efficiency programs will be, in some ways, compelled to act as though that policy does not exist,** with the result that electrification efforts are erroneously seen as too expensive. One example, among many: Mass Save's BCR models for the 2019-21 Plan assume that program-supported heat pumps replace functional heating equipment, but fossil fuel heating systems are assumed to be installed at end-of-life.[4] This makes the heat pumps seem more expensive by comparison, and hurts their cost-effectiveness. Real progress on electrification means taking full advantage of replace-on-failure situations, as the CECP acknowledges: "transitioning the buildings sector in a strategic and least cost manner… relies on immediately starting to leverage stock-turnover points."[5]

Heat pumps face another challenge: while they dramatically reduce both fossil fuel consumption and emissions, convincing homeowners, landlords, and business owners to install them is more complicated—and therefore costly—than it would be for a more familiar product like a clothes washer or light bulb. While heat pumps are demonstrably cost-effective, particularly for homes that currently burn oil for heat, they may not be cost-effective enough to overcome the **extra resources that will be required to extend financial and technical assistance to 100,000 homeowners** and thousands of HVAC contractors each year. Even today, at 12,750 residential installations per year, the total cost of the heat pump measures delivered through Mass Save is about 20% administration, marketing, advertising, technical assistance, and evaluation research—32% in the low-income sector. The eight-fold increase in installations that the CECP envisions will almost certainly compound those costs. By setting and heavily publicizing a

[4] Navigant. "Energy Optimization Measures and Assumptions Model." Excel spreadsheet presented to the Massachusetts Program Administrators and Energy Efficiency Advisory Council, March 2020. Accessible here.
[5] Draft Clean Energy and Climate Plan for 2030. Page 28.

statewide electrification target, **the Commonwealth can remove this drag on Mass Save, leaving the programs to offer the maximum possible amount of financial assistance** for homeowners, landlords, and business owners.

The CECP does propose an electrification standard of sorts: a declining cap on emissions from heating fuels. **Acadia Center supports this proposal in principle, insofar as it could have the potential to drive adoption of heat pumps and other clean, electric equipment.** However, inconsistencies in the Commonwealth's methods of tracking emissions—in particular, its inadequate way of accounting for the global warming impact of methane leaks in natural gas transmission and distribution systems[6]—may mean that such a program would lead to more oil-to-gas fuel switching. Such an outcome would be unacceptable. **Acadia Center will oppose this cap if it is not structured to support electrification specifically.**

Both Maine and New York have adopted electrification targets. Maine's target, set in statute,[7] ensures that 20,000 air-source heat pumps will be installed each year until 2025—a significant goal in a state with slightly more than 500,000 housing units. New York State's goal is set in an order[8] from the state's Department of Public Service and targets an amount of fossil fuel displacement measured in trillion BTUs. **Acadia Center recommends that the Administration consider adopting a goal along these lines.** Doing so would send a clear signal to manufacturers, distributors, contractors, utilities, and consumers that the Commonwealth is serious about rapid electrification.

A statewide building electrification target may also be structured to make utility program administrators, or some other entity, responsible for a certain amount of progress on electrification. Currently, Mass Save PAs are held to account on the overall goals of each Three-Year Plan. The 2019-2021 Plan term sheet sets a savings goal in lifetime MMBTU and commits to a certain number of heat pump installations, but electrification is not specifically included among the core terms of the Plan. **Setting core terms for electrification in the 2022-24 Plan, and tying them to performance incentives, will go a long way toward realizing the goals set out in the CECP.**

Tracking Progress on Electrification Can Help to Calibrate Policies

Currently, the only data available on electrification of buildings comes from the Mass Save programs. As the market transforms, more heat pumps and heat pump water heaters will be sold without a program incentive. However, none of these data are currently tracked.

Acadia Center recommends that EEA and DOER consider working with the Commonwealth's HVAC and plumbing distributors to track the number of heat pumps installed each year in Massachusetts, along with their characteristics—especially sale price and, for space heating equipment, heating capacity, efficiency, installation configuration (ductless or ducted, partial or full displacement of fossil fuels) and power draw ratings. Maintaining a database of heat pump installations will provide valuable insight into consumer and contractor preferences, which

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[6] See joint comments of Acadia Center and 33 other organizations pertaining to the future of natural gas in the Commonwealth.
[7] Maine Revised Statutes. Title 35-A, Part 8, Chapter 97, §10119.2.A.2.
[8] New York Department of Public Service. Case # 18-M-0084: In the Matter of a Comprehensive Energy Efficiency Initiative. "Order Authorizing Utility Energy Efficiency and Building Electrification Portfolios Through 2025." Appendix C: 2020-2025 Heat Pump Budgets and Targets (Gross MMBTU). January 16, 2020.

could help the state and Mass Save PAs to design appropriate educational and training materials and orient programs toward the needs of the market.

Making the data public could even show skeptical consumers how many of their neighbors have electrified their heating system. Finally, it could provide useful data on whether the Commonwealth is on track to meet its 2030 goal. MassCEC could serve as a potential data aggregator, providing manufacturers and installers with standardized confidential reporting tools.

High Electric Rates Will Limit Heat Pump Adoption

Electric rate design is a crucial component to successful and widespread deployment of heat pump technology. While electric heat pumps reduce overall residential energy consumption and emissions by eliminating fossil fuel use, they increase electric consumption, particularly in the winter. To protect consumers and incentivize further heat pump adoption, Acadia Center recommends that the Administration work with the Department of Public Utilities and investor-owned electric utility companies to **develop and support rate classes that are more favorable to electrification.**

According to DPU data,[9] residential basic service rates for energy—the part of an electric rate that varies over time—are between 22% (Eversource) and 28% (National Grid) more expensive in the heating season than in the warmer months. Yet Massachusetts homes will use much more electricity in the winter after electrification. Particularly as the grid becomes greener with more offshore wind and hydroelectricity that can keep up with winter peaks better than fossil fuels, electric rates should shift to further electrification. Designing electric rates with that in mind will help to **make the path to an all-electric future smoother** for the Commonwealth's households and businesses.

Equity in Everything—Especially Buildings

The climate crisis is inseparable from the housing crisis, and the Commonwealth must actively acknowledge this in all its greenhouse gas mitigation policies and programs. Acadia Center agrees wholeheartedly with the CECP's characterization that:

> "The ability of Massachusetts residents to participate in the transition to a low-carbon economy—such as owning an electric vehicle or retrofitting their homes to be more energy efficient—will differ according to income level, ability to access and benefit from available resources, location in urban and rural settings, proficiency in English, and previous marginalization."[10]

Acadia Center would like to offer some input regarding policy and programmatic changes which may help to extend more of the benefits of energy efficiency to marginalized populations in the Commonwealth.

As it pertains to buildings, **a commitment to equity happens to overlap to a significant degree with a commitment to greenhouse gas mitigation.** This is due to a confluence of factors related to the state's building stock and demographics:

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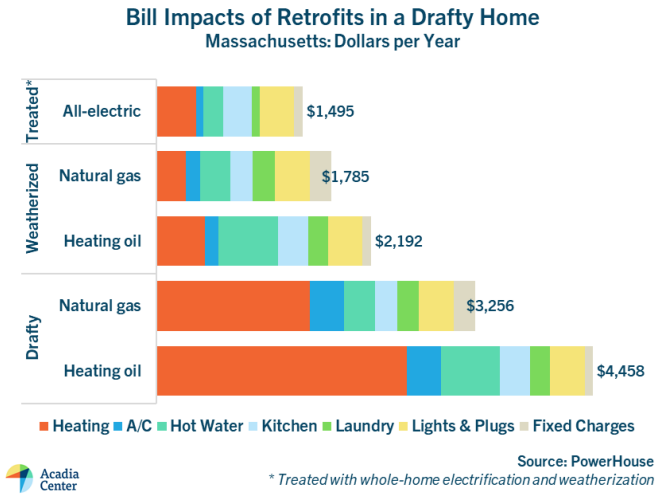
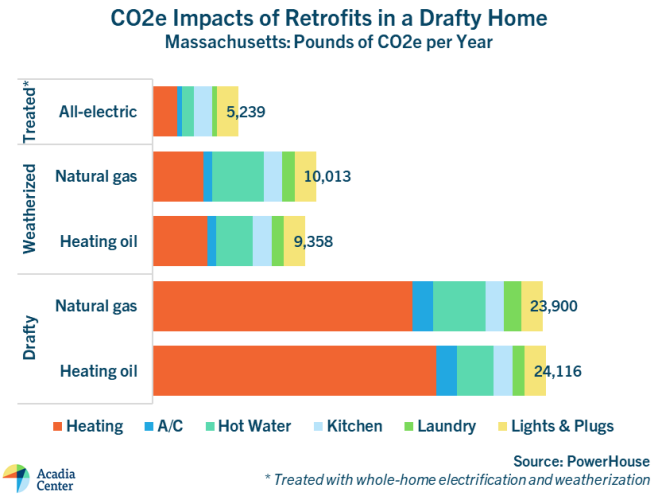
[9] https://www.mass.gov/info-details/basic-service-information-and-rates
[10] Draft Clean Energy and Climate Plan for 2030. Page 10.

- **Massachusetts' building stock is old.** Nearly 70% of housing units in Massachusetts were built before the first building energy code was adopted in the 1970s, and many have not been renovated since.
- **Less affluent people are more likely to live in older units.** About 80% of households that receive Medicaid or similar federal assistance live in a unit that was built before 1980, compared to 68% of households that do not receive assistance.
- **Less affluent households pay more of their income toward housing costs.** Rent represents, on average, 28% of household income for households receiving assistance, but just 8% for other households.
- **People of color** represent 19% of Massachusetts' population but 31% of people living in rentals and 31% of people receiving assistance.

Not all environmental justice communities live in substandard housing, and not all occupants of substandard housing are considered part of an environmental justice community. But for the nearly 30% of people of color in Massachusetts who both receive federal assistance and live in an old housing unit, **the same efficiency measures can dramatically reduce both energy burden and emissions.**

Acadia Center analysis shows that whole-home electrification and weatherization upgrades in older, draftier housing units can **cut energy bills by more than half while reducing emissions by 78%.** Meeting the Commonwealth's climate targets will undoubtedly require policies and programs that specifically target these units with increased attention and funding. Targeting electrification of housing in environmental justice and low-income communities will also be protective against those ratepayers bearing the majority of stranded costs in the wind down of the gas infrastructure system, and push market transformation toward heat pumps.





Equity Within Mass Save

Acadia Center strongly supports the CECP's strategies related to equitable access to energy efficiency and clean heating, particularly the strategy action stating:

> "DOER will work to expand access to energy efficiency and clean heating for low- and moderate-income renters and homeowners in EJ communities through targeted community-based incentives and outreach programs, and increased funding for pre-weatherization barriers."[11]

As a long-time member of the Energy Efficiency Advisory Council, Acadia Center offers the following comments regarding how expanded access may be achieved.

The Green Communities Act requires that 10% of electric funding for energy efficiency and 20% of gas funding be spent on income-eligible programs. For over a decade, the Low-Income Energy Affordability Network (LEAN) has overseen the disbursement of these funds through the state's community action agencies (CAP agencies) in collaboration with Mass Save program administrators. **In the current 2019-21 Plan term to date, the PAs have invested nearly $200 million** into energy efficiency upgrades in households with an income at or below 60% of the state median. This crucial source of funding must be maintained and expanded.

Higher levels of attention and investment in environmental justice communities through Mass Save can be accomplished, in part, by focusing on the following factors:

- **Split incentive.** The split incentive, where landlords are reluctant to pay for efficiency upgrades when tenants will receive savings from lower bills, is a notorious and difficult barrier to serving rental units with energy efficiency upgrades. Many low- and moderate-income households in Massachusetts live in rental units like this. Providing free or sharply reduced-cost energy efficiency services to landlords would induce more participation but would not guarantee that the property owner would not still raise rents, as though he or she had paid the full cost of efficiency measures. Conversely, offering landlords the same incentives as any other building owner leaves many tenants without meaningful access to programs that they pay for through a charge on their energy bills. Mass Save PAs cannot address this issue on their own.

  The Commonwealth should consider stepping in and requiring properties offered for rent to meet a baseline level of efficiency improvement before a certain date, then directing them to existing sources of financial assistance from Mass Save. Coupled with rent stabilization provisions, this could increase access to energy efficiency among renters to a substantial degree.

- **Targeting and qualification.** Prospective low-income participants often must produce an onerous amount of documentation to prove that they are eligible for program incentives. This level of granularity in means-testing is almost certainly discouraging potential applicants. Qualifying participants based on the median household income in their U.S. Census block group[12] would alleviate this unnecessary leg work, make it easier to households to participate, and lead to more energy savings and emissions reductions.

[11] Draft Clean Energy and Climate Plan. Page 31.
[12] Census block groups generally contain between 600 and 3,000 people. []

- **Health impacts.** A 2018 study[13] conducted on behalf of the Mass Save PAs quantified the non-energy benefits of home weatherization and heating system replacement for low-income households in Massachusetts. That study found, among other findings, that the non-energy impact of a reduction in asthma flares due to home weatherization has a value to society of $11,531 for each treated home.

  This study did not consider health and safety impacts from electrification measures like heat pumps and induction stoves, however. **Funding a study focused on the health impacts of this latter set of technologies can help the Commonwealth to ensure that it accounts for all the many benefits of treating low- and moderate-income homes with weatherization and electrification.**

- **Moderate-income households.** For the Commonwealth's energy efficiency programs, "low-income" is defined as a household with an income that is 60% or less than the state median. In 2021, this is equal to $51,137 for an elderly couple living alone or $75,201 for a family of four. This is a bright line test: a two-person household with an income of $52,000, for instance, would likely pay the same customer cost share under the market rate (non-income qualified) program as a family making $400,000. As programs in the 2019-2021 plan have shown, **extending enhanced** weatherization and heating **incentives to moderate-income households that make between 61% and 100% of the state median income could help to expand participation and target financial assistance where it is truly needed.** Studies have shown that these moderate-income households do not enjoy equal access to program incentives.[14]

- **Administrative cost relief.** Low-income energy efficiency programs are, on the ground, delivered by Massachusetts' CAP agencies. These agencies always operate at high capacity, but have been even busier than usual this year due to the economic devastation that the pandemic has brought. Meaningful investment in environmental justice communities must involve more administrative support and funding for CAP agencies.

Chapter 4: Transforming our Energy Supply

Acadia Center wishes to commend the Commonwealth's commitment to reductions of emissions from the electric power sector. A successfully decarbonized electric grid will serve as the backbone to economy-wide decarbonization efforts in the building and transportation sectors. The CECP projects 4.2 MMTCO2e in reductions from the electric power sector by 2030, with offshore wind, solar, and new transmission to access Québec hydropower procured through Section 83(D) leading the way.

Acadia Center's comments focus on the need to ensure continued progress in meeting the Commonwealth's renewable energy procurement targets while ensuring proper siting and equity. In addition, Acadia Center's comments address the need for regional market reform and reform to the distribution-level system.

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[13] Three[3] and NMR Group, Inc. "Low-Income Multifamily Health- and Safety-Related NEIs Study (TXC50) Preliminary Findings Report." October 15, 2018. Page 5.

[14] Navigant, Illume, and Cadeo. "Residential Nonparticipant Market Characterization and Barriers Study." Prepared for the Electric and Gas Program Administrators of Massachusetts. February 27, 2020.

Executing Renewable Procurements by 2030 and Reforming Regional Markets

The policy objectives embodied in Massachusetts' current clean energy commitments and envisioned for the next 10-30 years require a dramatically transformed approach to energy market design and transmission planning in a way that addresses the grid's impacts on equity and environmental justice. As detailed in strategy E1, timely executing solar and offshore wind programs and procurements alongside in-state and regional transmission investments will be key to the Commonwealth's success. Any substantial delay will negatively impact the Commonwealth's ability to meet interim targets and decarbonize its electric sector and broader economy by 2050. **In recognition of that strategy, Acadia Center stresses that it is crucial for the Commonwealth to continue procurements of offshore wind and solar resources, while considering additional state procurements, regional procurement coordination and engaging in efforts to reform the ISO-NE transmission planning, governance framework, and capacity markets.** Those processes, particularly at the ISO-NE level, are likely to take years, and this should not be a justification to pause or curtail renewable generation procurements in the meantime.

Acadia Center supports Strategies E2 and E3, which describe the Commonwealth's engagement in regional electricity market reforms, transmission planning, and increased transparency and other governance reforms. Proper coordination and transparency among the New England states will be critical to ensuring that Massachusetts is on-track to meeting its 2030 goal, but more importantly, that the Commonwealth and region is on track to meeting its goal of a fully decarbonized grid in the subsequent decades. The CECP builds on the New England Governors' Vision Statement and describes the existing flaws and shortcomings of the regional grid. Acadia Center agrees that strategies outlined in E2 and E3 must apply to future policies and has long advocated for reforms to ensure that clean energy resources are fully incorporated into and valued in the market.

Today, the state's commitments to large scale renewable energy generation are not being reflected in the regional electricity markets, so Massachusetts customers pay for additional resources in the ISO markets plus these resources under state procurements. Transmission planning updates similarly must focus on ways to rapidly and cost effectively deploy clean energy resources. As well, the state should prioritize addressing the current lack of consideration in the regional markets for the state's commitments to distributed energy resources, energy efficiency, and other advanced, customer-sited technologies. These clean resources can serve the regional market as energy, capacity, and non-transmission alternatives that will also enhance the resilience and reliability of the grid. If the region is unable to rapidly integrate clean energy resources like offshore wind into the grid, states' emission reduction targets will be undermined and consumers will bear additional climate risk along with health and economic burdens.

Acadia Center supports and has been an active partner in the New England Governors' Vision statement process, as well as in the "Transition to the Future Grid" initiative at ISO-NE, advocating for reforms to the organizational governance structure, improved equity and transparency, and much needed reforms to the capacity markets and transmission planning to fully value renewable resources. Acadia Center, along with a group other environmental non-profits, submitted comments on energy market reforms and the need for improved transmission planning to the effectively and efficiently advance the priorities outlined in the October 2020 Governors' Vision Statement. Acadia Center's comments on governance reforms will be available on the New England Energy Vision website on March 26, 2021. Acadia Center requests that the comments submitted to the New England Governors be incorporated by reference into this submittal.

Acadia Center urges EEA 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.

Clean Energy Imports

Acadia Center supports the strategy articulated in E2 to limit emissions associated with imported electricity to 2 MMTCO2e. This implies that electricity with a high carbon content will be replaced with electricity with a low to zero carbon content. To properly account for and analyze the success of the Commonwealth in reaching that goal, Acadia Center requests that EEA express the imported electricity emissions cap for the 2030 generation target in terawatt-hours (TWh) and CO2e/MWh emission rate. Expressing this goal only as absolute metric tons of CO2e does not provide necessary clarity as to how the Commonwealth projects this reduction to happen. This will provide an estimate of the projected carbon intensity of the grid in 2030 that the Commonwealth expects and help determine the level of remaining gas-powered electricity that the Commonwealth expects to remain on the grid by 2030.

Solar Siting Opportunities

Acadia Center supports EEA's attention paid to developing appropriate solar siting opportunities in the Commonwealth through 2025 and beyond, as laid out in strategy E4. The CECP correctly notes that the environmental and land-use impacts of ground-mounted solar will be significant in that Commonwealth, using an estimated 60,000 acres of land in Massachusetts by 2050, even with maximal rooftop deployment. A solar buildout of this scope requires that the Commonwealth adopt planning and siting criteria that protect natural space, greenfield sites, carbon sequestering forests, while also allowing solar development at the most optimal locations.

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 over farmland, forests, wetlands, and other habitat space. EEA should work to provide clarity, predictability, and assistance to communities, landowners, and developers in the Commonwealth by pre-screening potential sites that could address and significantly ease the possibility of siting challenges and delays. **Acadia Center recommends that EEA 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.**

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. Acadia Center concluded that the state could meet its 26% of the state's ground-mounted solar needed to meet its 2030 goals through projects sited on contaminated land. As well, installing solar on 22% of the state's residential buildings could achieve the state's 2030 rooftop solar target.

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."

Municipal Light Plants Need Legislation to Bring them Under the Cap

Municipal light plants (MLPs or munis) represent approximately 14% of the Commonwealth's load, but are not currently subject to the GWSA targets, RPS, CES, or CES-E. Acadia Center supports strategy action E3 that includes mandating participation under the RPS, CES, and CES-E in a manner appropriate to MLPs' specific circumstances. Transparent and comprehensive reporting requirements are also essential to ensuring that clean energy attributes are not claimed by both MLPs and the buyers of certificates sold by MLPs. The strategies in E3 will put the Commonwealth on track to meet its decarbonization goals, as well as to ensuring that every Massachusetts community does its share to reach the state's carbon goals and benefit from the ratepayer and public health benefits of decarbonization, regardless of the entity delivering electricity to their homes and businesses.

Concerns Regarding Out-of-Region Hydroelectric Power

Acadia Center acknowledges the role that hydroelectric power has the potential to play in the low-carbon grid of the future, particularly the Commonwealth's contract for 9.5 TWh of eastern Canadian hydropower through the New England Clean Energy Connect (NECEC). The Commonwealth's ability to remain on track to meeting its 2030 goal is dependent on the completion and interconnection of the NECEC line by no later than mid-2023.

However, the clean energy benefits of large-scale impoundment hydroelectricity, which comprises the majority of Hydro-Québec's (HQ) 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 they were was low-carbon hydropower.[15] The remaining imported electricity lacks such documentation and is counted as undifferentiated system power.

Acadia Center's 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. 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.[16] Additionally, hydro reservoirs create major, permanent changes to watersheds and surrounding landscapes, which impact the biosphere and can disrupt traditional ways of life for First Nations communities. Acadia Center applauds the CECP's focus on environmental justice communities in the Commonwealth and underscores the importance of also addressing First Nation environmental justice issues in Canada. **Although HQ has not made public any near-term plans to create new impoundments, Acadia Center opposes procurements and other clean energy policies that would make eligible the additional buildout of hydroelectric impoundment dams in Canada and elsewhere.**

Any decarbonization scenario that is reliant on Canadian hydropower to meet decarbonization targets should also **require stringent attribute accounting and employ related safeguards to reduce uncertainty in the carbon content of imported hydropower**. Taking this step will ensure that these imported resources are not being backfilled in the Quebec control area with dirty fossil fuel powered electricity. Acadia Center, during the NECEC and 83D negotiations, was and continues to be strongly in favor emission tracking akin to NEPOOL-GIS tracking for zero-carbon and renewable resources.[17]

Acadia Center encourages EEA and other stakeholders in Massachusetts to study the possibly of using existing and new transmission resources and existing Canadian hydropower as a bi-directional pumped storage resource. Over the next decade and 30 years, Massachusetts and the New England region will invest heavily in offshore wind. While this resource has a high capacity factor, it is not always coincident with current peak electric demand, often producing the most electricity during the night and in the winter season. In addition to incentivizing offshore wind paired with storage, Massachusetts should explore the possible use of Canadian hydro resources as a grid balancing resource to further the Commonwealth's clean energy goals, regional decarbonization, and international cross-border cooperation.

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[15] 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).

[16] Ocko Ilissa, Hamburg, Steven. "Climate Impacts of Hydropower: Enormous Differences among Facilities and over Time". Environ Sci Technol. 2019 Dec 3;53(23):14070-14082. doi: 10.1021/acs.est.9b05083.

[17] Acadia Center reply brief on long-term contract for procurement of Clean Energy Generation, pursuant to Section 83D of An Act Relative to Green Communities, Massachusetts Department of Public Utilities Dockets 18-64, 18-65, 18-66 (April 3, 2019), https://fileservice.eea.comacloud.net/FileService.Api/file/FileRoom/10562136.

Need for Distribution System-Level Planning

Acadia Center supports the incorporation of the GWSA targets into distribution system-level planning and policy considerations. Improvements to distribution system-level planning and grid modernization will be critical components of meeting the goals of the CECP and delivering consumer and environmental benefits, especially as buildings and vehicles are increasingly electrified and greater numbers of DERs are integrated. By conducting all-encompassing planning that considers customers' energy, capacity, and thermal needs, alongside social concerns like climate and justice, Massachusetts would be better positioned to achieve the CECP's ambitions and transform the Commonwealth's energy system. EEA must work with DPU, DOER, and the Attorney General's office to improve distribution level planning processes and ensure that cost-benefit analyses appropriately consider the benefits of achieving Net Zero by 2050. All the state agencies that play a role in distribution planning must be fully empowered to consider climate, health, and equity in their decision-making.

Acadia Center supports reforms to cost-benefit methodologies to fully capture the climate, equity, and health benefits of transitioning away from fossil fuels and towards cleaner alternatives. By not appropriately accounting for these benefits, outdated existing benefit-cost tests may limit progress towards the CECP's goals.

While grid modernization is a key piece of the CECP, grid modernization efforts to date in Massachusetts have been notoriously slow. For example, attempts to push for Advanced Metering Infrastructure (AMI) have been ongoing for years, without any significant progress made to date. AMI is an important and transformative tool in managing bi-directional energy flows and making use of the data that DERs can provide for grid operators. Massachusetts is far behind many other states in terms of its AMI deployment, and the DPU must accelerate its decision-making to deliver the benefits to ratepayers that AMI offers. Aligning utility business models and incentives with the state's climate goals will be essential for overcoming these barriers and contributing to the success of the CECP.

The recommendations and vision outlined in the CECP are vital for Massachusetts to meet its climate targets. It is imperative for the state to accelerate progress in transforming its energy system, especially given the many challenges from powerful incumbent stakeholders who would prefer the status quo. In a notable illustration of this position, Eversource Energy included the following warning in its 2021 10-K report:

> "New technology and alternative energy sources could adversely affect our operations and financial results. Advances in technology that reduce the costs of alternative methods of producing electric energy to a level that is competitive with that of current electric production methods, could result in loss of market share and customers, and may require us to make significant expenditures to remain competitive. These changes in technology could also alter the channels through which electric customers buy or utilize energy, which could reduce our revenues or increase our expenses."[4]

Clearly, Eversource considers technologies that would be beneficial for consumers and the environment as threats to its business model and financial prospects. This perspective is incompatible with the aims of the CECP. If Massachusetts is committed to meeting its climate targets, it must ensure that all stakeholders are positioned to act as partners in carrying out the goals of the CECP.

Conclusion

In conclusion, Acadia Center requests that EEA:

- **Adopt a specific, realistic strategy** for electrifying one million homes and 300-400 million square feet of commercial real estate by 2030.
- **Establish a regulatory or legislative target for building electrification** to ensure rapid progress and jump-start the marketplace for zero-emissions-ready technologies in buildings.
- **Consider the limitations in the Mass Save program's design and cost-effectiveness accounting methods** that may impede its ability to support the number of installations envisioned by the CECP.
- **Revisit electric rate design** to ensure that electric rates reflect and support the Commonwealth's electrification policy goals.
- **Continue aggressive timelines and procurements of offshore wind and solar.**
- **Develop appropriate solar siting opportunities** in the Commonwealth through 2025 and beyond.
- **Work to include MLPs in meeting regulatory targets** in the GWSA, RPS, CES, and CES-E.
- **Require stringent attribute accounting** and employ related safeguards to reduce uncertainty in the carbon content of imported hydropower.

Sincerely,

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